Ongoing Monitoring Report (November 2022 – October 2023)

Naval Communication Station Harold E Holt Area B



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Executive Summary

Introduction

Cardno, now Stantec (Cardno), were engaged by the Australian Department of Defence ("Defence") to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP)[1] at Naval Communication Station Harold E Holt – Area B, Western Australia ("HEH-B" or the "site"), Western Australia (WA) (Figure 1, Appendix A).

The OMP outlines the rationale and scope for monitoring the concentrations and extent of PFAS in groundwater, seepage water, surface water, and sediment originating from the source areas identified at HEH-B. The source areas are depicted in Figure 2, Appendix A.

The OMP includes sampling and analysis from the site and several surrounding (off-site) waterways. The site and these surrounding areas are collectively referred to as the 'Management Area' and were identified during a Detailed Site Investigation (DSI) in 2018 (GHD, 2018)[2]. The Management Area (MA) is shown in Figure 2, Appendix A.

Objectives

The objective of the ongoing monitoring program is to assess changes in the nature and extent of PFAS within the environment. The OMP uses the monitoring network developed as part of the PFAS Management Area Plan [3](PMAP) to monitor the amount of PFAS leaving the site through the groundwater and surface water. The PMAP was designed to target areas where there is a potentially elevated risk to a receptor (for example, to people or the environment) associated with Defence's historical use of legacy aqueous film forming foam (AFFF).

Monitoring Scope

The November 2022 – October 2023 monitoring period comprised two biannual monitoring events (November 2022 and June 2023). The scope of work for the biannual monitoring events comprised monitoring of 33 groundwater wells, six seepage water locations and 11 co-located sediment and surface water locations, as specified in the OMP.

A first flush sampling event was meant to take place after the first heavy rainfall of the wet season to gain an understanding of PFAS concentrations and distribution just after heavy rainfall. During the November 2022 – October 2023 monitoring period insufficient rainfall occurred during the wet season and a first flush sampling event could not be completed.

Groundwater elevation data was collected from 33 groundwater wells during the biannual monitoring events.

Works were conducted in accordance with the methodologies detailed in the Sampling and Analysis Quality Plan (SAQP) (Cardno, 2023c, Appendix B), except as summarised in Section 3.6 of this report.

Groundwater Results

Groundwater Flow Direction

Groundwater flow direction was generally consistent between the two biannual monitoring events and historical data; all indicating a groundwater flow direction from the site eastward towards the Exmouth Gulf.

[1] The OMP is publically available at www.defence.gov.au/Environment/PFAS/lharoldeholt, and is found as Attachment 1 of the PFAS Management Area Plan
[2] Publically available at www.defence.gov.au/Environment/PFAS/haroldeholt
[3] Department of Defence, 2019, Naval Communication Station Harold E Holt – Area B – PFAS Management Area Plan.

PFAS Concentrations

The groundwater results recorded during the monitoring period remained within the same order of magnitude as historical data.

There were no first-time detection or new exceedance of guideline values at any of the monitoring locations during the monitoring period except at MW154S, where a new exceedance of the recreational criteria was identified. This result is however limited to this location and no evidence of downgradient migration of PFAS is observed.

Trend interpretation predominantly indicated that the PFAS concentrations were stable.

What is an 'order of magnitude'?

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

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

Seepage Water Results

Seepage water is groundwater that is moving to the surface (with groundwater flow and tide effect mechanisms). There were no detections of PFAS recorded above the laboratory limit of reporting (LOR) during the monitoring period, at the seepage water monitoring locations.

Surface Water Results

Throughout the monitoring period rainfall was significantly lower than average and only one surface water location was able to be sampled, SW181, at the end of the main drainage channel. PFAS concentrations at SW181 were reported below LOR in both sampling events.

What is a 'limit of reporting'?

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

Sediment Results

PFAS concentrations in sediment were within historical range, with most locations reporting PFAS concentrations below LOR. Locations SS164 and SS165, positioned close to the site boundary in the drainage channel, reported concentrations above the LOR. SS169 in the November 2022 sampling event and SS171 in the June 2023 sampling event also recorded concentrations above the LOR (both located downstream of SS164 and SS165). This is consistent with historical results.

Given the absence of continuous surface water flow in the main drain leaving site (Pathway 2), it is established that PFAS migration with surface water (that could result in increased PFAS concentrations in sediment) would be a very slow process. It is considered that the sediment sampling locations are adequately positioned to assess changes in surface water runoff and resulting sediment impacts.

Risk Summary

The evaluation of November 2022 – October 2023 monitoring results indicates the nature and extent of PFAS in groundwater, seepage water, surface water and sediment remain consistent with results from previous investigations, despite slight fluctuations in PFAS concentrations at individual locations.

The potential exposure pathways for human health (such as recreational anglers in the Management Area) and ecological receptors (such as land and aquatic flora and fauna) identified during the DSI (GHD, 2018) have been reviewed and are still considered to be appropriate. The OMP data collected to date does not suggest any significant changes to these mechanisms.

Information gathered during the November 2022 – October 2023 monitoring period supports the conclusion made in previous investigations, that PFAS poses a low risk to recreational anglers with respect to bioaccumulation in commonly caught fish species, and that PFAS poses a low risk to the commercial prawn fisheries of the Exmouth Gulf Managed Prawn Fishery. Based on the current available data, including these collected as part of the implementation of the OMP, there is no change to the above risk profile.

The OMP contains management response triggers, which are concentrations that would trigger an additional assessment and risk analysis to determine if additional management is required. None of the management response triggers presented in the OMP were exceeded during the monitoring period.

Potential changes in groundwater, surface water, seepage water, and sediment PFAS concentrations will continue to be evaluated through future monitoring and reporting.

Conclusions

The nature and extent of PFAS across the OMP monitoring network has not significantly changed from the understanding presented in the PMAP (Defence, 2019), the DSI (GHD, 2018) and previous OMP monitoring reports.

Potential trends in PFAS concentrations (both decreasing and increasing depending on the location and PFAS type under review) are noted at limited groundwater monitoring locations throughout the Monitoring Area. There was indication in the 2022 OMR that PFAS could be migrating with groundwater towards the east and the north-east, however, no evidence of discharge into the Exmouth Gulf was observed during the monitoring period.

The surface water monitoring locations were mostly dry during the monitoring events, and the sediment results were within historical range with the only detection above the LOR recorded in the main drainage channel leaving site (i.e. Pathway 2).

The absence of PFAS detection in seepage water samples indicate that the PFAS discharge (if any) to the Exmouth Gulf is negligible. Furthermore, decreasing trends were observed in monitoring wells targeting the low laying areas to the west of the sand dunes (i.e. between the site and the Exmouth Gulf).

The November 2022 - October 2023 monitoring results did not identify a change in the conceptual site model (CSM) understanding or the risk profile for the Management Area. No new source of PFAS contamination, transport pathway or potential receptor have been identified during the monitoring period.

The OMP is currently being reviewed to assess the adequacy of the monitoring network and frequency of monitoring events, considering the OMP data collected to date.

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Chemical Names

DO	Dissolved Oxygen
ORP	Oxidation Reduction Potential
PFAS	Per and Polyfluoroalkyl Substances
PFHxS	Perfluorohexane Sulphonate
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate

Technical Terms

AFFF	Aqueous Film-Forming Foam
ASS	Acid Sulfate Soil
BoM	Bureau of Meteorology
CF	Confidence Factor
CoV	Coefficient of Variation
CSM	Conceptual Site Model
DSI	Detailed Site Investigation
ERA	Ecological Risk Assessment
EGMPF	Exmouth Gulf Managed Prawn Fishery
HEPA	Heads of Environmental Protection Authorities
LOR	Limit of Reporting
MAR	Mandatory Auditors Report
MA	Management Area
PDWSA	Protective Drinking Water Source Area
QA	Quality Assurance
QC	Quality Control
QA/QC	Quality Assurance/Quality Control
SAQP	Sampling and Analysis Quality Plan
SMP	Site Management Plan
SWL	Standing Water Level
SRV	Site Remediation and Validation
VAR	Voluntary Audit Report
WA	Western Australia

Units

mAHD	Metre relative to the Australian Height Datum
mbgl	Metres below ground level
mbTOC	Metres below Top of Casing
mg/kg	Milligram per Kilogram (approximately equivalent to ppm)
mg/L	Milligram per Litre
mV	Millivolt
µg/L	Microgram per Litre
µS/cm	Micro Siemens per Centimetre (Electrical Conductivity - Water)

Site Specific

HEH-B	Naval Communication Station Harold E Holt – Area B
OMR	Ongoing Monitoring Report
OMP	Ongoing Monitoring Plan
PMAP	PFAS Management Area Plan
FTA	Fire Training Area
WWTP	Waste Water Treatment Plant

1 Introduction

The Australian Department of Defence ("Defence") engaged Cardno, now Stantec (Cardno) to undertake the November 2022 and June 2023 groundwater, seepage water, surface water and sediment monitoring events at and around the Naval Communication Station Harold E Holt – Area B, Western Australia (WA) ("HEH-B" or "the site") as part of the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP).

The site is located at the end of the North West Cape of Western Australia (WA), at the northern edge of Exmouth and is displayed in Figure 1, Appendix A.

1.1 Background

The OMP outlines the rationale and scope for monitoring the concentrations and extent of PFAS in groundwater, seepage water, surface water, and sediment originating from the site. The monitoring program consists of biannual monitoring events conducted in November and June, as well a 'first flush' surface water and sediment monitoring event conducted immediately (or as close as possible) following the first heavy rainfall event of the wet season.

During the November 2022 – October 2023 monitoring period insufficient rainfall occurred during the wet season and no first flush sampling event was completed.

1.2 Purpose and Objectives

The specific objectives of the monitoring specified in the OMP are to:

- Evaluate the nature and extent (spatial and temporal) of PFAS impact in groundwater and surface water pathways associated with site sources of PFAS derived from historical use of Aqueous Film-Forming Foam (AFFF);
- Monitor the migration of PFAS in groundwater and surface water from the site;
- Provide confirmation of the current understanding of risk; and
- Provide supporting data for assessment of management actions, where relevant.

The purposes of the Ongoing Monitoring Report (OMR) are to:

- Inform Defence and key stakeholders of PFAS trends in surface water, groundwater and sediment;
- Assess any variations in the distribution of PFAS for the site and how this may change the understanding of the conceptual site model and risk profile; and
- Provide recommendations for any potential changes in the location and frequency of sampling which may be incorporated in the revision of the OMP.

1.3 Scope of Work

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

- Cardno, June 2023, *PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) Naval Communication Station Harold Holt B*. Revision 8 (Cardno, 2023c).

The assessment included the following main components:

1. Undertake the November 2022 groundwater, surface water and sediment monitoring event:
    - Gauging of 32 single and multi-level groundwater monitoring wells;
    - Sampling of 32 groundwater monitoring wells;
    - Sampling six seepage water locations;
    - Sampling of one surface water location; and
    - Sampling 11 sediment locations.
2. Undertake the June 2023 groundwater, surface water and sediment monitoring event:

- Gauging of 33 single and multi-level groundwater monitoring wells;
- Sampling of 33 groundwater monitoring wells;
- Sampling six seepage water locations;
- Sampling one surface water location; and
- Sampling 11 sediment locations.

3. Data assessment and reporting for the November 2022 – October 2023 monitoring period.

1.4 Standards of Assessment and Limitations

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

This report is not any of the following:

> A Mandatory Audit Report (MAR) or Voluntary Audit Report (VAR) as defined under the *Contaminated Sites Act 2003* (CS Act).

> A Geotechnical Assessment.

> A Detailed Site Investigation (DSI).

> A Detailed Hydrogeological Assessment.

> A Remediation Action Plan (RAP) or Site Remediation & Validation (SRV) report.

> A Site Management Plan (SMP).

2 Site Setting

HEH-B is located approximately 2.0 kilometres (km) north of Exmouth, 1,250 km north of Perth and covers an area of 2,020 hectares (ha). HEH-B was established in 1967 and is host to a High Frequency (HF) transmitter and associated administration facilities.

The site is situated at the end of the North West Cape of WA, at the northern edge of Exmouth. The majority of the buildings and associated infrastructure and support services are located in the southern portion of the site and include:

- HF transmitter;
- Base administration facilities;
- Service facilities including vehicle maintenance workshop;
- Former recreational and living quarters;
- Waste water treatment plant (WWTP);
- Water treatment plant (WTP);
- Firefighting services and training area (current and former);
- Landfill areas including Class IV landfill and asbestos landfill;
- Lease areas for non-military use including Sea Breeze Resort (no longer in active use); and
- Other activities include former fuel storage and distribution, in above and below ground tanks and chemical storage (including paints and solvents).

2.1 Site Definition and Planning

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

Table 2-1 Site Identification Details

Details	Description
Site Address	Murat Road, North West Cape, WA 6707
Land Description	Harold E Holt Area B
Owner	Commonwealth of Australia
Title Details	Lot 43 on Plan P209471 and Lot 78 on Plan P211955
Planning Zone / Land use	Public Purposes – Government Services
Local Government Authority (LGA)	Shire of Exmouth
Boundary corner coordinate (eastings and northings in GDA94, Zone 50)	▪ North-west corner: 199,167 mE, 7,576,901 mN ▪ North-east corner: 205,188 mE, 7,577,210 mN ▪ South-west corner: 204,428 mE, 7,572,508 mN ▪ South-east corner: 199,212 mE, 7,574,561 mN

2.2 Surrounding Land Uses and Zoning

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

Table 2-2 Surrounding Land Uses

Direction	Land Use
North	Vacant crown land (open space)
West	Vacant crown land (open space); Ningaloo Marine Park further to the west
East	Exmouth Gulf, used for commercial aquaculture activities (prawn fishing)
South	Exmouth township

2.3 Management Area Description

The OMP includes sampling and analysis not only from the site, but also from a number of surrounding (offsite) waterways, groundwater monitoring wells and seepage locations. The site and these surrounding areas are collectively referred to as the 'Management Area'. The Management Area boundaries are presented in Figure 2, Appendix A.

The Management Area includes:

- The onsite and offsite source areas (as described in Section 2.5)
- Land to the east and north-east of the Base (down-gradient) to the coastline (Receptor C) and including the backwater lagoon area (Receptor B) and the low laying areas to the west of the sand dunes (Receptor A).
- The drainage channel south-east of the Base (Pathway 2) and area directly east of the source areas (Pathway 1).

2.4 Environmental Setting

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

Table 2-3 Site Environmental Setting Key Details

Setting	Description
Climate	The region has a hot, semi-arid climate, with a wet and dry season. The maximum temperatures range between 37.9ºC (January) and 24.2ºC (July) while minimum temperatures range between 11.4ºC (July) and 24.7ºC (February) [Bureau of Meteorology (BoM), 2024]. Rainfall occurs generally between January and July with monsoonal showers between January and late April. August to December is generally dry. The highest volume of rainfall typically occurs during the month of June with a mean monthly rainfall amount of 43.5 mm.
Topography	Elevation across HEH-B typically ranges between 1 and 20 metres relative to the Australian Height Datum (mAHD). A natural ridge line runs north/south along the western boundary of the site, with the south-west portion of the site (specifically the water tower) being higher than the surrounding area.
Geology	**Regional Geology** The site is underlain by the geological units of the North West Cape range primarily comprising carbonate sediments. The Cape Range Group consists of: ▪ Trealla Limestone: permeable, hard and tightly jointed limestone beneath unconsolidated Quaternary deposits. Contains both karst areas and areas of recrystallization. ▪ Tulki Limestone: relatively permeable, hard and tightly jointed. Encountered at depths of 50 to 100 m below ground level (mbgl). Karst features such as caves occur within the recrystallized limestone. ▪ Mandu Limestone: low permeability limestone encountered at greater than 150 mbgl. ▪ Birdrong Sandstone: underlies the Cape Range Group, comprising a fine to coarse grained silty sandstone. **Site Specific Geology** Previous environmental investigations have reported superficial colluvium, comprising poorly sorted clay, silt, sand and gravel. Bore logs indicated between 1.0 to 6.0 m of red silty sand at the surface, below which the sand becomes denser and weakly cemented in places with coral limestone or shell fragments.
Acid Sulfate Soil	A review of the Acid Sulfate Soils (ASS) risk mapping, available on the WA Atlas online database indicates that the area encompassing the site is classified as having no known ASS disturbance risk. The coastline to the east of the site is mapped as having a high to moderate risk of ASS occurring.

Setting	Description
Hydrology	HEH-B has a local ridge line along the western boundary of the site. A network of man-made, concrete lined drainage channels traverses the site, generally following the natural topography and exiting the site to the east beyond Murat Road. The majority of surface water runoff from the site therefore ultimately discharges to the coastline. However, a portion goes to the Wastewater Treatment Plant (WWTP) located east of the site. The area to the east of the site, inland from the coastline, has previously been observed with surface water slowly draining after heavy rainfall. Areas of standing water were observed in low lying areas. Local surface water flow (including rainfall runoff) is expected to follow the local topography until it is either intersected by stormwater drainage systems onsite, infiltrates the sub-surface, or collects at the backwater lagoon east of the site.
Hydrogeology	The Quaternary and Tertiary-aged sediments are hydraulically interconnected and together form the major, unconfined aquifer of the area. The superficial Quaternary layers (dunes, colluvium, alluvium) are considered to be no more than 20 m in thickness. Groundwater in the Quaternary units is considered to be perched and discontinuous. The coastal dunes may also contain relatively fresh groundwater but of limited extent (lenses). ▪ **Groundwater Occurrence/Quality** – The site consists of the following multi-layered aquifer system comprising of the following: – Exmouth North – Carnarvon Cape Range Limestone (unconfined) – Exmouth North Saline Resource – Birdrong. Recharge of the aquifers occurs through direct recharge from rainfall infiltration, and indirect recharge along drainage lines from occasional sea water flooding and stormwater runoff. Hydraulic conductivities in the aquifer are likely to be highly heterogeneous and depend on the permeability of the overlying colluvium in the Quaternary sediments, and the degree of fracturing and connectivity of fractures in the deeper limestone.
Hydrogeology (continued)	Groundwater salinity in the region is a result of the relationship between rainfall recharge, extraction, groundwater through flow and the intrusion of a sea water lens into the aquifer. The interface between the low and high salinity groundwater is considered to be diffuse and approximately 1 to 20 metres in thickness. Anecdotal information suggests the presence of a fresh water body overlying the saline wedge. ▪ **Depth to Groundwater** – Depth to groundwater was recorded beneath the site varying between 1.2 m below top of casing (BTOC) and 9.5 mBTOC, with groundwater elevations recorded between 0.2 mAHD (MW132) and 3.5 mAHD (MW135) in June 2023. This was on average 20 cm shallower than during the November 2022 monitoring event. Inferred groundwater contours are presented in Figures 4 and 5, Appendix A. Groundwater depth is known to be influenced by tidal variations. ▪ **Groundwater Flow Direction** – Regional groundwater on the North West Cape is likely to flow in a radial pattern from the range heights towards both east and west coasts. The results of the November 2022 and June 2023 gauging events indicated that the inferred groundwater flow direction was generally to the east, towards the Exmouth Gulf. A north/north-easterly component of the flow beneath the site is also observed. Previous investigations reported a low hydraulic gradient for the site. ▪ **Groundwater Use** – A number of unregistered extraction bores are understood to be present at residential properties within the township of Exmouth, located approximately 4.0 km south of the site. The Department of Water and Environmental Regulation (DWER) groundwater database indicates two extraction licences (with one bore each) allocated to two properties approximately 480 m north-west of the northern site boundary. Seven registered groundwater bores were shown to be present approximately 7.2 km north-west of the northern site boundary. A borefield, comprising 16 potable water supply bores, is located approximately 2.0 to 3.0 km south-west of HEH-B. Groundwater is extracted from the Cape Range aquifer and pumped via underground pipelines to a WTP. ▪ **Protective Drinking Water Source Area (PDWSA**) – The site is not located within a PDWSA. The Exmouth Water Reserve drinking water source protection review area, a Priority 1 area, is located approximately 870 m south-west of the site at its closest point. Priority 1 areas are usually undeveloped and under state management. ▪ **Receiving Surface Water Body** – Beneath the majority of the site, groundwater is generally moving in an easterly direction towards the Exmouth Gulf.

Setting	Description
Environmental Sensitive Areas	The site occurs within an area that is included on the Register of the National Estate because of its natural heritage value, under the Australian Heritage Council Act 2003 of the Commonwealth. ▪ The Cape Range Subterranean Waterways wetlands occurs across the site. ▪ The Cape Range National Park is located approximately 7.0 km to the south-west of the site at its closest point. ▪ The Bundegi Conservation Reserve is adjacent to the north-east of the site. ▪ The Ningaloo Coast, a World Heritage listed site is located within 10 km of the site. The Ningaloo Coast is also listed on the National Heritage Property register.
Wetlands	The site occurs within the Cape Range subterranean waterways wetland, listed under the Directory of Important Wetlands.
Further information can be found in the DSI report (GHD 2018) and previous OMP reports.	

2.5 Source Areas

A total of 11 source areas were identified during the DSI where PFAS was detected in soil and/or groundwater (GHD, 2018). Table 2-4 summarises the most impacted areas (Figure 2, Appendix A).

Table 2-4 HEH-B Source Areas

Location	Source Area
Source Area North (onsite)	▪ Area 02 – “KC” Hardstand Area ▪ Area 03 – Fire Department Training Area ▪ Area 07 – Former Landfills ▪ Area 11 – Class IV Landfill
Source Area South (onsite)	▪ Area 01 – Former Fire Training Area ▪ Area 04 – Fire Extinguisher Training Area ▪ Area 05 – Building 380 (Warehouse) ▪ Area 06 – Operational Fire Station ▪ Area 08 – Possible former fire training and AFFF Storage Area (Pre-1992) ▪ Area 09 – Former Fire Fighting Facility
Source Area South (offsite)	▪ Area 10 – Waste Water Treatment Plant (WWTP)

PFAS concentrations in surface soils were highest in the source areas. The concentrations of PFAS did not exceed the screening criteria for protection of human health but exceeded the ecological screening criteria in a number of investigation areas (GHD, 2018).

It is likely that the concrete/asphalt of the KC Hardstand (Area 02) and the Fire Station driveway (Area 06) are acting as ongoing sources of PFAS to sub-surface soils and groundwater via leachate.

Estimates calculated from the DSI data (GHD, 2018) indicated that the greatest mass of PFAS remains in the soil and groundwater in the former Fire Training Areas (Areas 01, 04 and 08).

3 Sampling and Analytical Methodology

3.1 Sampling Dates

A summary of the sampling event dates for the November 2022 – October 2023 monitoring period is presented in Table 3-1.

Table 3-1 Summary of Sampling Dates

Sampling event	OMP Activity	Sampling Period
November 2022	Groundwater monitoring (sampling and gauging)	20 to 21 November 2022
	Surface water seepage water, and sediment sampling	
June 2023	Groundwater monitoring (sampling and gauging)	26 June 2023
	Surface water seepage water, and sediment sampling	

3.2 Groundwater Sampling

Sampling of groundwater monitoring locations was conducted in accordance with the SAQP (Cardno 2023c, Appendix B), applying methods set out in Section 6.3.3 of the SAQP.

The groundwater wells monitored as part of the OMP are presented in Table 3-2 and are shown in Figure 3, Appendix A.

Table 3-2 Groundwater Monitoring Locations

Monitoring Area	Location ID
Onsite – Source Area South	MW310, MW311, MW315, MW103D, MW113, MW115, MW142, MW143
Offsite – Source Area South	MW135, MW122, MW126, MW144S
Onsite – Source Area North	MW326, MW105S, MW108, MW145
Offsite – Source Area North	MW134, MW147, MW148S
Offsite – Pathway 1	MW151S, MW152S, MW153S, MW154S, MW137, MW155S
Offsite – Pathway 2	MW118D, MW133, MW022
Offsite – Receptor A	MW128, MW129, MW130, MW131, MW132

3.3 Seepage Water Sampling

Seepage water monitoring and sampling was conducted in accordance with the SAQP (Cardno 2023c, Appendix B), applying methods set out in Section 6.3.3 of the SAQP. The seepage water monitoring locations monitored as part of the OMP are listed in Table 3-3 and are shown in Figure 3, Appendix A.

Table 3-3 Seepage Water Monitoring Locations

Monitoring Area	Location ID
Offsite Receptor C	OTH101, OTH102, OTH103, OTH104, OTH105, OTH106

3.4 Surface Water Sampling

Sampling of surface water monitoring locations was conducted in accordance with the SAQP (Cardno 2023c, Appendix B) applying methods set out in Section 6.4.3 of the SAQP. The surface water locations monitored as part of the OMP are presented in Table 3-4 and are shown in Figure 3, Appendix A.

Table 3-4 Surface Water Monitoring Locations

Monitoring Area	Location ID
Offsite Pathway 2	SW164, SW165, SW167, SW169, SW171, SW173, SW179, SW181,
Offsite Receptor B	SW161, SW162, SW163

3.5 Sediment Sampling

Sampling of sediment monitoring locations was conducted in accordance with the SAQP (Cardno 2023c, Appendix B), applying methods set out in Section 6.4.3 of the SAQP. The sediment locations monitored as part of the OMP are presented in Table 3-5 and are shown in Figure 3, Appendix A.

Table 3-5 Sediment Monitoring Locations

Monitoring Area	Location ID
Offsite – Pathway 2	SS164, SD181, SS165, SS167, SS169, SS171, SS173, SS179
Offsite – Receptor B	SS161, SS162, SS163

Note: Sediment is considered to be wet material and is denoted by “SD” while dry material is considered to be surface soil or “SS”.

3.6 Deviations from the OMP SAQP

Deviations from the SAQP for the November 2022 – October 2023 monitoring period are summarised in Table 3-6.

Table 3-6 Summary of deviations from the OMP SAQP

Location	Deviation	Comments
		November 2022
SW161, SW162, SW163, SW164, SW165, SW167, SW169, SW171, SW173, SW179	Not sampled	These surface water monitoring locations were found dry. Limited impact on the OMP, sediment data was collected at the co-located monitoring locations.
MW122	Not analysed	No sample was analysed for this well due to the sample being misplaced in the field. Minimal impact – No data was collected for this well for the November 2022 monitoring round, however it is noted concentrations of Sum of PFHxS and PFOS recorded at MW122 have been consistent, with concentrations ranging from 1.66 µg/L to 3.41 µg/L. In addition to this, concentrations of Sum of PFHxS and PFOS have previously displayed a stable trend. Data assessment and interpretation for MW122, which is located in Source Area South, can be drawn upon nearby wells (MW144S - 0.14 km, north; MW310 - 0.17 km, west and MW126 - 0.21 km, north-east) in the same source area screened at similar depths.
MW126	No field parameters recorded	This monitoring well had no field parameters recorded due to the field parameters erased from the data collection mobile application. Limited impact on the OMP – No field parameters were collected for this monitoring round; however previous field data indicates the field parameters are consistent between monitoring rounds.
		First Flush 2023
All	Monitoring event not completed	Insufficient rainfall amount to trigger first flush conditions.
		June 2023
SW161, SW162, SW163, SW164, SW165, SW167, SW169, SW171, SW173, SW179	Not sampled	These surface water monitoring locations were found dry. Limited impact on the OMP, sediment data collected at the co-located monitoring locations.
MW115	Only sampled for PFAS	Insufficient amount of water in hydrasleeve to collect a full sample. No impact, non-PFAS analytes and physicochemical parameters do not inform critical OMP decisions.
MW129, MW130, MW132, MW134, MW135	Field parameters recorded once prior to sampling	Due to field error, field parameters were recorded once prior to sampling rather than three consecutive readings during purging. The field parameters at these wells were consistent with the historical range, and the deviation from the SAQP is not expected to impact the outcomes of the assessment.

3.7 Changes to the Monitoring Network Condition

The following changes to the monitoring network condition were noted for the November 2022 – October 2023 monitoring period:

> MW109 has become inaccessible in overgrown bushland (replaced by MW108).

> The vegetation in the bushland surrounding the site is overgrown and some tracks are no longer accessible with a vehicle (for instance there is no track to access MW135, MW152S or MW153S).

4 Quality Control / Quality Assurance

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

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

A detailed review of the Quality Assurance/Quality Control (QA/QC) aspects was completed during the November 2022 and June 2023 monitoring events and are included within the factual reports presented in Appendix C.

4.1 Summary

The laboratory has undertaken different Quality Control (QC) measures in all sets of sample analysis which validate the accuracy of their techniques. The laboratory is appropriately certified for environmental sample analysis. It is considered that the results are accurate and reliable for the purposes of this assessment.

The data validation process has concluded that there are no significant systematic errors in the data collection process. Therefore, the data set used as the basis for the surface water, groundwater, seepage water and sediment assessment is considered valid and complete.

5 Assessment Criteria

5.1 Groundwater, Seepage Water and Surface Water

The assessment criteria adopted for groundwater, seepage water and surface water in this OMP are based upon the Heads of Environmental Protection Authorities Australia and New Zealand (2020) *PFAS National Environmental Management Plan 2.0* (NEMP; HEPA 2020) and findings from previous site assessment [i.e. DSI (GHD 2018)]. The adopted assessment criteria for groundwater, seepage water and surface water are detailed in Table 5-1.

Table 5-1 Criteria for Groundwater, Seepage Water and Surface Water

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	µg/L		
Human Health – Recreational Water	2[1]	10	NHMRC 2019, HEPA 2020
Ecological – 99% species protection	0.00023[2]	19	HEPA 2020

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

5.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. The sediment concentrations are compared to the historical range of ongoing monitoring results and new maximum concentrations or first-time detections at each sediment sampling location are recorded.

6 Contextual and Ancillary Information

6.1 Additional Analytical Data

All data available on the ESdat database at the time of reporting for each OMP monitoring location was utilised to form the basis of the interpretations and conclusions presented in this report.

6.2 Remediation and Infrastructure Projects

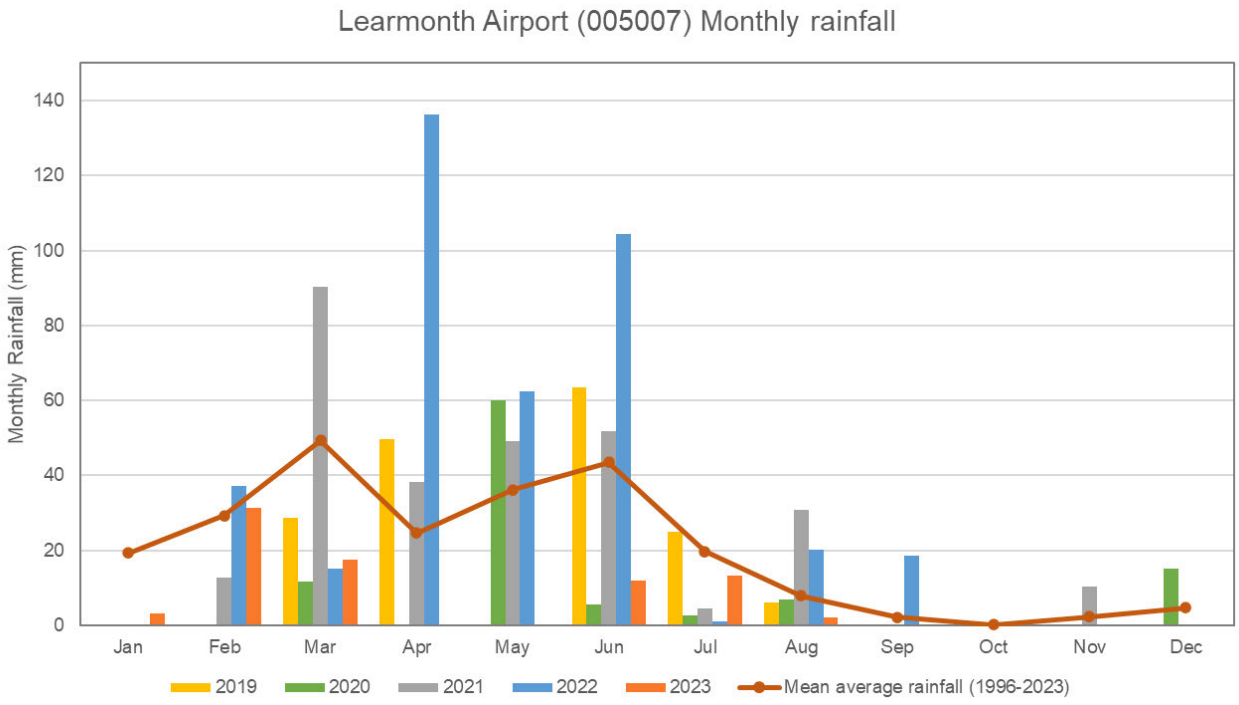
No remediation project or infrastructure works that could affect the interpretation of monitoring results were undertaken at the site during the monitoring period.

6.3 Climate

Rainfall can potentially influence the PFAS migration, and groundwater elevation and flow direction. Monthly rainfall for January 2019 to October 2023 obtained from the Bureau of Meteorology (BoM) station No 005007 is displayed in Figure 6-1.

The monthly rainfall amounts for the November 2022 – October 2023 monitoring period were below average. The wet season which generally runs from November until April, was well below average for this monitoring period with no rainfall observed in November or December and minimal in January (3.2 mm), March (17.6 mm) and April (0.2 mm).

Figure 6-1 Monthly rainfall and long term mean monthly rainfall for Exmouth Airport (station 005007) (BoM, 2024)



7 Monitoring Data Summary

The November 2022 and June 2023 monitoring results are presented within the factual reports provided in Appendix C, consolidated data tables are presented in Appendix D, and results are displayed in Appendix A:

- Figures 6, 8 and 10 for the November 2022 biannual event;
- Figures 7, 9 and 11 for the June 2023 biannual event.

7.1 Groundwater

7.1.1 Groundwater Physicochemical parameters

Groundwater physicochemical parameters recorded during the November 2022 and June 2023 monitoring events are summarised in Table 7-1 and provided in Table 2, Appendix D.

Table 7-1 Groundwater Physicochemical Parameters

Parameter	November 2022	June 2023
Dissolved Oxygen (DO)	0.55 mg/L (MW155S) – 4.82 mg/L (MW143) *Aerobic conditions.*	0.73 mg/L (MW132) – 6.23 mg/L (MW152S) *Aerobic conditions.*
Electrical Conductivity (EC)	480 µS/cm (MW311) – 56,467 µS/cm (MW128)	507 µS/cm (MW311) – 56,751 µS/cm (MW128)
pH	5.89 (MW154S) – 7.92 (MW131) *Acidic to alkaline conditions.*	6.76 (MW154S) – 7.99 (MW315) *Neutral to alkaline conditions.*
Oxidation-Reduction Potential (ORP)*	-106.1 mV (MW132) – 248.8 mV (MW113) *Reducing to oxidising groundwater conditions.*	61.4 mV (MW132) – 238.3 mV (MW128) *Oxidising groundwater conditions.*
Note: * corrected ORP values (i.e. field reading + 200mV)		

The physicochemical parameters were generally within the historical ranges recorded for the site. No seasonal variability was observed.

7.1.2 Groundwater Elevations and Migration Contours

Groundwater levels recorded during the November 2022 and June 2023 monitoring events and inferred and flow directions are summarised in Table 7-2 and gauging data is provided within Table 1, Appendix D. Figures 4 and 5, Appendix A, present the inferred groundwater contours for the November 2022 and June 2023 monitoring events.

Table 7-2 Groundwater Levels and Flow Direction

Item	November 2022	June 2023
Depth to groundwater	1.90 (MW133) mbTOC – 9.87 mbTOC (MW143)	1.94 mbTOC (MW133) – 9.95 mbTOC (MW143)
Groundwater elevation	-3.668 mAHD (MW126) – 0.767 mAHD (MW153S)	0.075 mAHD (MW130) – 1.057 mAHD (MW155S)
Inferred direction of groundwater flow	For both monitoring events the groundwater was interpreted to be flowing easterly toward the Exmouth Gulf. In November 2022 some mounding was noted between the site and the coastline.	
Seasonal difference in groundwater elevation	Groundwater levels were on average 0.2 m deeper during the November 2022 event than during the June 2023 event.	

Groundwater elevations and flow direction for the monitoring period were consistent with historical data. It is noted that the well gauging data was collected over several days and tide cycles. This has been considered when interpreting the inferred groundwater contours and flow direction.

7.1.3 Onsite and Offsite Source Areas Summary Results

7.1.3.1 Source Area North

A summary of the Perfluorooctanoic Acid (PFOA) and the Sum of Perfluorohexane Sulphonate (PFHxS) and Perfluorooctane Sulfonate (PFOS) concentrations for the monitoring period and the historical concentration ranges for the Source Area North monitoring locations are presented in Table 7-3, with the Sum of PFHxS and PFOS concentrations plotted in Figure 7-1.

Table 7-3 Source Area North PFOS, Sum of PFHxS and PFOS, and PFOA Concentrations

Location ID	Analyte	Historical range	OMP Monitoring	
		Min – Max (µg/L)	Nov 2022 (µg/L)	Jun 2023 (µg/L)
MW105S	PFOS	3.92 – 8.26	5.60	5.35
	PFHxS and PFOS	5.02 – 10.6	8.26	6.09
	PFOA	0.13 – 0.66	0.76	0.25
MW108	PFOS	0.018 – 0.033	0.02	0.02
	PFHxS and PFOS	0.10 – 0.12	0.14	0.16
	PFOA	<0.001 – 0.006	<0.01	<0.01
MW134	PFOS	<0.001 – 0.03	<0.01	<0.01
	PFHxS and PFOS	<0.001 – 0.17	<0.01	<0.01
	PFOA	<0.001- <0.01	<0.01	<0.01
MW145	PFOS	<0.01 – 0.19	<0.01	<0.01
	PFHxS and PFOS	<0.01 – 0.19	<0.01	<0.01
	PFOA	<0.01 - 0.12	<0.01	<0.01
MW147	PFOS	<0.01 – 0.008	<0.01	<0.01
	PFHxS and PFOS	<0.01 - 0.008	<0.01	<0.01
	PFOA	<0.001- <0.01	<0.01	<0.01
MW148S	PFOS	<0.01 – 0.01	<0.01	<0.01
	PFHxS and PFOS	<0.01 - 0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01
MW326	PFOS	<0.01 – 0.07	0.03	0.02
	PFHxS and PFOS	0.013 – 0.15	0.12	0.08
	PFOA	<0.01 – 0.04	0.02	0.01

New Maximum | New Minimum | New Exceedance

Note:
MW000 – multilevel well

MW105S, located within the Former Landfill, reported the highest PFAS concentrations for the Source Area North in November 2022. A new maximum concentration of PFOA (0.76 µg/L) was reported in the November 2022 sampling event.

Concentrations of PFAS were reported above the Limit of Reporting (LOR) and ecological assessment criteria in MW105S, MW108 and MW326, all located within the south-east of the source area. All PFAS concentrations detected were within the same order of magnitude as historical ranges.

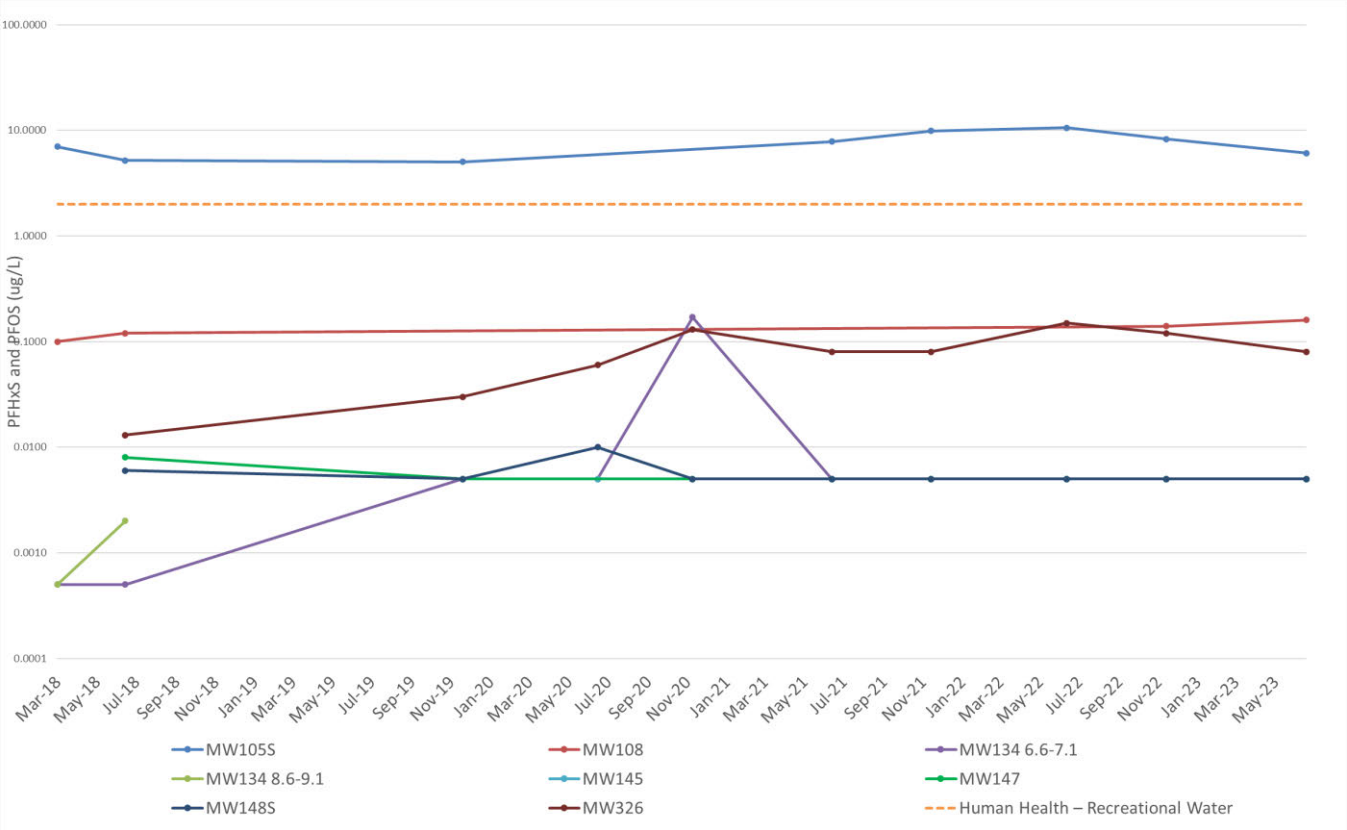


Figure 7-1 Source Area North Sum of PFHxS and PFOS, Concentration Trends

Note: A logarithmic scale was used for the vertical axis. Values below LOR were replaced by half of the LOR value (0.005 or 0.0005 µg/L) for the purpose of graphical representation.

7.1.3.2 Source Area South

A summary of the PFOA and the Sum of PFHxS and PFOS concentrations for the monitoring period and the historical concentration ranges for the Source Area South monitoring locations are presented in Table 7-4, with the Sum of PFHxS and PFOS concentrations plotted in Figure 7-2.

Table 7-4 Source Area South PFOS, Sum of PFHxS and PFOS, and PFOA Concentrations

Location ID	Analyte	Historical range	OMP Monitoring Event	
		Min – Max (µg/L)	Nov 2022 (µg/L)	Jun 2023 (µg/L)
MW103D	PFOS	2.61 - 13.00	3.03	2.00
	PFHxS and PFOS	5.11– 16.00	5.92	4.35
	PFOA	0.06 – 0.15	0.09	0.06
MW113	PFOS	0.050 – 0.39	0.08	0.04
	PFHxS and PFOS	0.27 – 0.71	0.28	0.17
	PFOA	<0.01 – 0.01	0.01	<0.01
MW115	PFOS	0.046 – 15.20	14.6	8.66
	PFHxS and PFOS	0.17 – 20.60	19.5	11.7
	PFOA	0.12 – 0.77	0.70	0.42
MW122	PFOS	0.15 – 0.39	0.30	0.24
	PFHxS and PFOS	1.66 – 3.41	2.27	1.09
	PFOA	0.12 – 0.29	0.21	0.06
MW126	PFOS	0.25 – 2.45	0.34	0.30
	PFHxS and PFOS	0.31 – 3.62	0.52	0.44
	PFOA	0.05 – 0.20	0.08	0.10
MW135	PFOS	<0.01 – 0.012	<0.01	<0.01
	PFHxS and PFOS	<0.01 – 0.012	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01
MW142	PFOS	4.56 – 66.90	21.5	10.70
	PFHxS and PFOS	5.64 – 66.50	22.8	12.59
	PFOA	0.12 - 0.78	0.36	0.22
MW143	PFOS	2.70 – 8.93	6.73	4.70
	PFHxS and PFOS	3.36 – 9.48	7.18	5.10
	PFOA	0.30 - 0.58	0.76	0.52
MW144S	PFOS	4.00 – 10.40	13.00	6.90
	PFHxS and PFOS	4.6 – 13.30	15.70	9.67
	PFOA	0.55 - 0.96	0.96	0.88
MW310	PFOS	0.32 – 5.74	4.15	2.02
	PFHxS and PFOS	1.83 – 43.4	31.40	13.10
	PFOA	0.07 – 0.70	0.54	0.31
MW311	PFOS	0.08 – 0.55	0.33	0.22
	PFHxS and PFOS	0.17– 0.94	0.52	0.33
	PFOA	0.03 – 0.08	0.02	0.01
MW315	PFOS	<0.01 – 0.10	0.01	<0.01
	PFHxS and PFOS	<0.01 – 0.12	0.01	<0.01
	PFOA	<0.001 – <0.01	<0.01	<0.01

New Maximum | New Minimum | New Exceedance

Note:
MW000 – multilevel well

The highest PFAS concentrations for the source area south were all reported in the November 2022 sampling event, with the highest PFOA concentration (0.96 µg/L) reported at MW144S, the highest Sum of PFHxS and PFOS concentration (31.4 µg/L) reported at MW310 and the highest PFOS concentration (21.5 µg/L) reported at MW142.

New maximum concentrations of PFOS (13 µg/L) and Sum of PFHxS and PFOS (15.70 µg/L) were reported at MW144S in November 2022 and did not represent a magnitude of order increase. A new maximum PFOA concentration was reported at MW143 (0.76 µg/L) in November 2022.

New minimum concentrations for PFOS and Sum of PFHxS and PFOS (MW103D and MW113) and PFOA (MW122) were reported in June 2023.

PFAS concentrations were generally reported at lower concentrations in the June 2023 sampling event in comparison with November 2022.

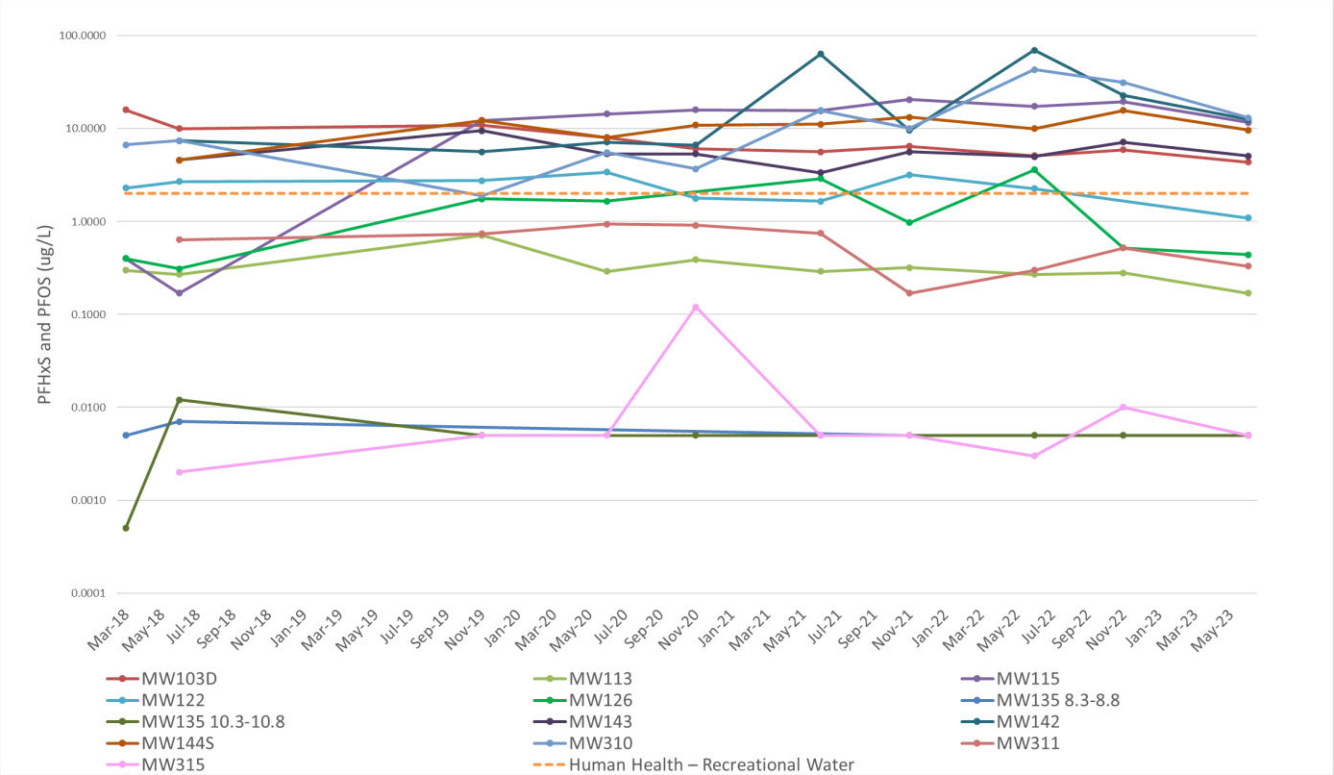


Figure 7-2 Source Area South Sum of PFHxS and PFOS, Concentration Trends

Note: A logarithmic scale was used for the vertical axis. Values below LOR were replaced by the half the LOR value (0.005 or 0.0005 µg/L) for the purpose of graphical representation.

7.1.4 Offsite Pathways and Receptors

The offsite pathways and receptors are presented in Figure 2, Appendix A and include:

- Pathway 1, groundwater flow to the east of the Source Area North;
- Pathway 2, groundwater flow along the drainage channel to the east of Source Area South; and
- Receptor A, located along the coastline.

7.1.4.1 Pathway 1

A summary of the PFOA and the Sum of PFHxS and PFOS concentrations for the monitoring period and the historical concentration ranges for the Pathway 1 monitoring locations are presented in Table 7-5 and the concentrations are presented in Figure 7-3. Note that locations MW151S, MW152S, MW153S and MW155S present the same concentrations over time (below LOR) in Figure 7-3.

Table 7-5 Pathway 1 Area PFOS, Sum of PFHxS and PFOS, and PFOA Concentrations

Location ID	Analyte	Historical range	OMP Monitoring	
		Min – Max (µg/L)	Nov 2022 (µg/L)	Jun 2023 (µg/L)
MW137	PFOS	0.001 – 0.015	<0.01	0.06
	PFHxS and PFOS	<0.001 – 0.017	<0.01	0.07
	PFOA	<0.001 – 0.001	<0.01	<0.01
MW151S	PFOS	<0.001 – <0.01	<0.01	<0.01
	PFHxS and PFOS	<0.001 - <0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01
MW152S	PFOS	<0.001 - <0.01	<0.01	<0.01
	PFHxS and PFOS	<0.001 - <0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01
MW153S	PFOS	<0.001 - <0.01	<0.01	<0.01
	PFHxS and PFOS	<0.001 - <0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01
MW154S	PFOS	0.22 – 1.12	0.85	0.74
	PFHxS and PFOS	0.28 – 1.99	2.00	1.72
	PFOA	0.02 - 0.09	0.08	0.07
MW155S	PFOS	<0.001 - <0.01	<0.01	<0.01
	PFHxS and PFOS	<0.001 - <0.01	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01
New Maximum	New Minimum		New Exceedance	

Note:
MW000 – multilevel well

The highest PFAS concentrations for Pathway 1 were reported at MW154S for both the November 2022 and June 2023 sampling events. A new maximum and recreational criteria exceedance of Sum of PFHxS and PFOS (2.00 µg/L) was reported at MW154S in November 2022. New maximum concentrations of PFOS (0.06 µg/L) and Sum of PFHxS and PFOS (0.07 µg/L) were reported at MW137 (south-east of site) in June 2023. All other locations reported PFAS concentrations below the LOR and adopted assessment criteria.

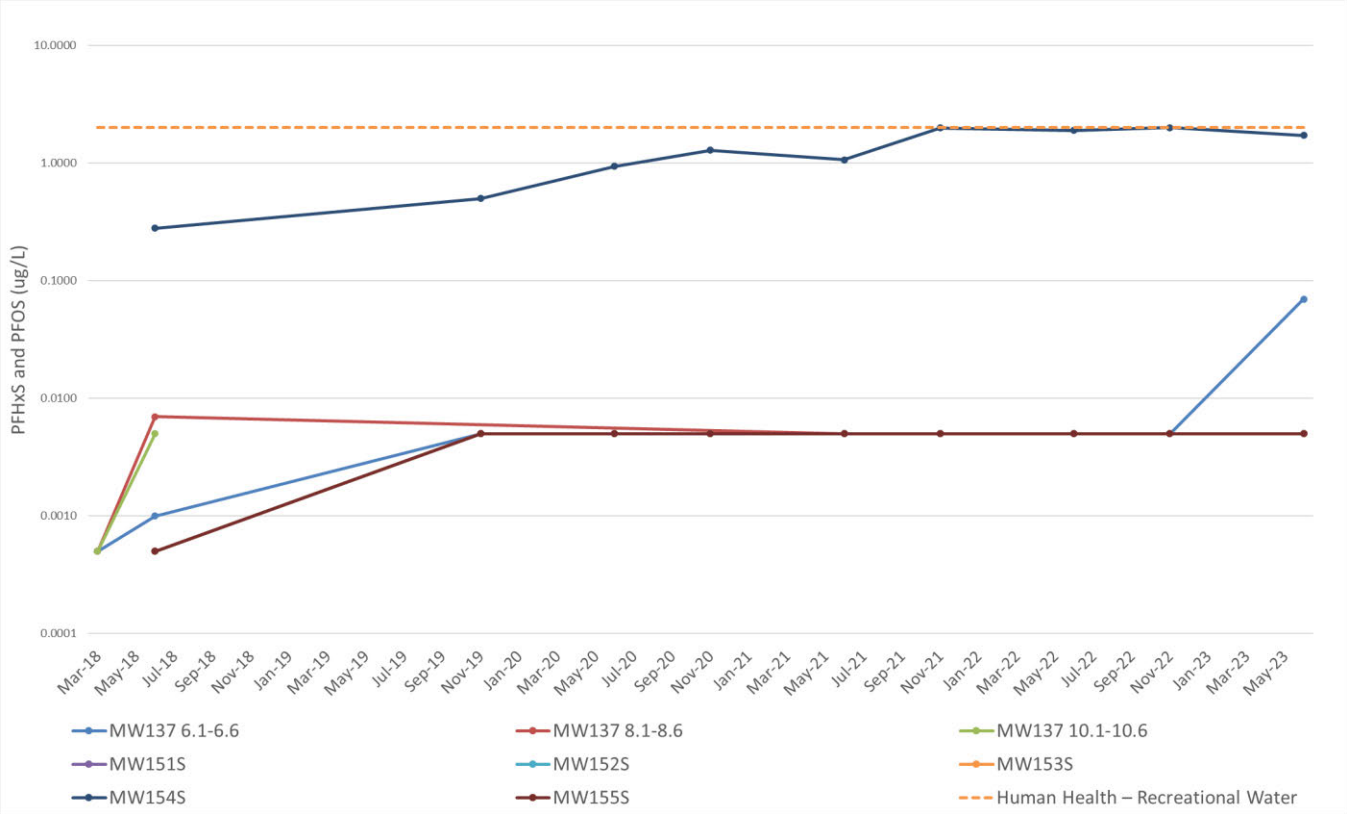


Figure 7-3 Pathway 1 Sum of PFHxS and PFOS, Concentration trends

Note: A logarithmic scale was used for the vertical axis. Values below LOR were replaced by half the LOR value (0.005 or 0.0005 µg/L) for the purpose of graphical representation.

7.1.4.2 Pathway 2

A summary of the PFOA and the Sum of PFHxS and PFOS concentrations for the monitoring period and the historical concentration ranges for the Pathway 2 monitoring locations are presented in Table 7-6, with the Sum of PFHxS and PFOS concentrations plotted in Figure 7-4.

Table 7-6 Pathway 2 PFOS, Sum of PFHxS and PFOS, and PFOA Concentrations

Location ID	Analyte	Historical range	OMP Monitoring	
		Min – Max (µg/L)	Nov 2022 (µg/L)	Jun 2023 (µg/L)
MW022	PFOS	1.6 – 4.14	2.39	3.34
	PFHxS and PFOS	3.0 – 6.49	2.75	3.89
	PFOA	0.32 – 0.81	0.18	0.21
MW118D	PFOS	10.20 – 18.00	10.90	8.62
	PFHxS and PFOS	12.6 – 35.3	13.00	10.30
	PFOA	0.88 – 1.9	0.70	0.58
MW133	PFOS	0.008 – 0.12	0.05	0.03
	PFHxS and PFOS	<0.001 - 0.16	0.05	0.03
	PFOA	<0.001 – 0.006	<0.01	<0.01

New Maximum | New Minimum | New Exceedance

Note:
MW000 – multilevel well

The highest PFAS concentrations were reported in MW118D for both sampling events. In the June 2023 sampling event new minimum concentrations of PFOS (8.62 µg/L), Sum of PFHxS and PFOS (10.30 µg/L) and PFOA (0.58 µg/L) were reported at MW118D. MW022 reported new minimum concentrations in November 2022 for Sum of PFHxS and PFOS (2.75 µg/L) and PFOA (0.18 µg/L).

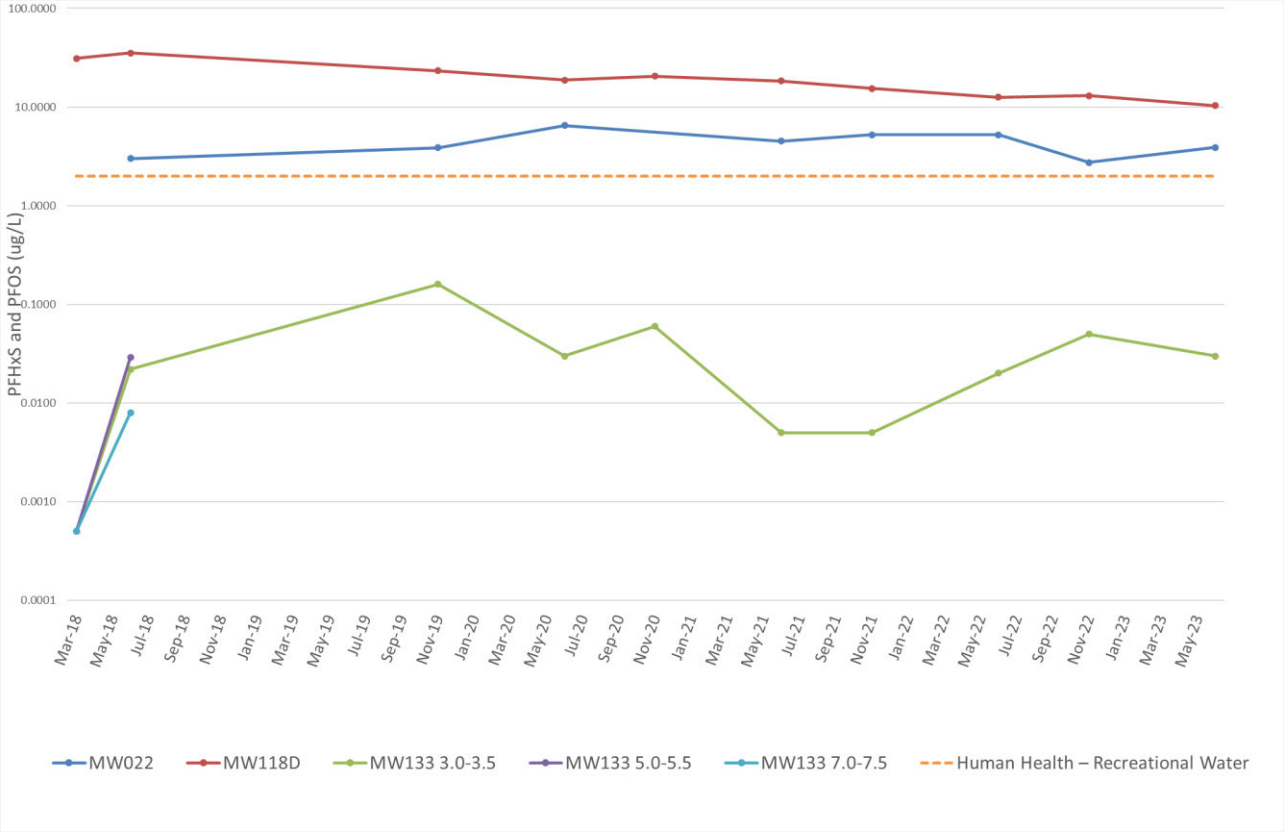


Figure 7-4 Pathway 2 Sum of PFHxS and PFOS, Concentration Trends

Note: A logarithmic scale was used for the vertical axis. Values below LOR were replaced by half the LOR value (0.005 µg/L) for the purpose of graphical representation.

7.1.4.3 Receptor A

A summary of the PFOA and the Sum of PFHxS and PFOS concentrations for the monitoring period and the historical concentration ranges for the Receptor A monitoring locations are presented in Table 7-7, with the Sum of PFHxS and PFOS concentrations plotted in Figure 7-5.

Table 7-7 Receptor A PFOS, Sum of PFHxS and PFOS, and PFOA Concentrations

Location ID	Analyte	Historical range	OMP Monitoring	
		Min – Max (µg/L)	Nov 2022 (µg/L)	Jun 2023 (µg/L)
MW128	PFOS	<0.001 - 0.03	<0.01	<0.01
	PFHxS and PFOS	<0.001 – 0.03	<0.01	<0.01
	PFOA	<0.001 – 0.001	<0.01	<0.01
MW129	PFOS	<0.001 – 0.064	<0.01	<0.01
	PFHxS and PFOS	<0.001 – 0.067	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01
MW130	PFOS	<0.01 – 0.32	<0.01	<0.01
	PFHxS and PFOS	<0.001 – 0.38	<0.01	<0.01
	PFOA	<0.001 – 0.002	<0.01	<0.01
MW131	PFOS	<0.001 – 0.02	<0.01	<0.01
	PFHxS and PFOS	<0.001 – 0.02	<0.01	<0.01
	PFOA	<0.001 - <0.01	<0.01	<0.01
MW132	PFOS	<0.001 – 0.004	<0.01	<0.01
	PFHxS and PFOS	<0.001 – 0.19	0.17	0.12
	PFOA	<0.01 – 0.025	<0.01	<0.01

New Maximum | New Minimum | New Exceedance

Notes:
MW000 – multilevel well

All wells reported PFAS concentrations below LOR for both sampling events with the exception of the Sum of PFHxS and PFOS concentrations being reported above the LOR at MW132.

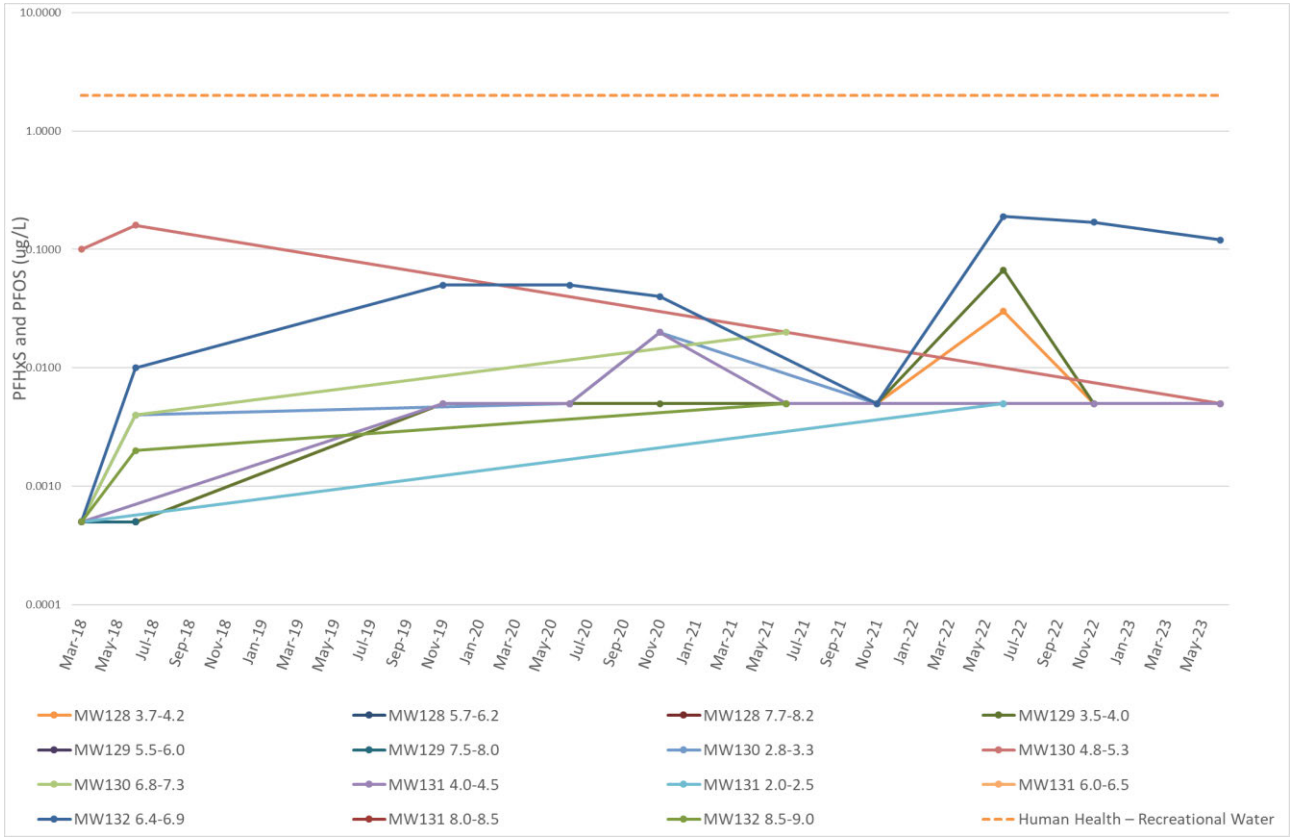


Figure 7-5 Receptor A Sum of PFHxS and PFOS, Concentration Trends

Note: A logarithmic scale was used for the vertical axis. Values below LOR were replaced by half the LOR value (0.005 or 0.0005 µg/L) for the purpose of graphical representation.

7.2 Seepage Water

7.2.1 Seepage Water Physicochemical parameters

Seepage water physicochemical parameters recorded during the November 2022 and June 2023 monitoring events are summarised in Table 7-8 and provided within the factual reports in Appendix C.

Table 7-8 Seepage water Physicochemical Parameters

Parameter	November 2022	June 2023
DO	3.45 mg/L (OTH101) – 4.37 mg/L (OTH104) *Aerobic conditions.*	3.46 mg/L (OTH101) – 9.36 mg/L (OTH102) *Aerobic conditions.*
EC	54,368 µS/cm (OTH102) – 55,494 µS/cm (OTH101)	54,785 µS/cm (OTH104) – 57,485 µS/cm (OTH105)
pH	8.06 (OTH101) – 8.19 (OTH103) *Alkaline conditions.*	7.78 (OTH102) – 8.15 (OTH106) *Alkaline conditions.*
ORP*	136.5 mV (OTH104) – 176.6 mV (OTH102) *Oxidising conditions.*	197.6 mV (OTH103) – 237.3 mV (OTH104) *Oxidising conditions.*

Note: * corrected ORP values (i.e. field reading + 200mV)

7.2.2 Seepage Water Results summary

Seepage water is groundwater that is moving to the surface (with groundwater flow and tide effect mechanisms). Monitoring of seepage water is conducted to identify PFAS movement (if any) and potential impact from impacted groundwater beneath the source areas, to downgradient receptors. Here, receptors include sea life of the Exmouth Gulf, in particular prawns. Seepage water is sampled rather than surface water to identify the PFAS concentrations (if any) before dilution and dispersion with ocean water occurs.

Seepage water has been sampled during an outgoing tide since February 2018 to capture groundwater discharge concentrations. Detections of PFOS and the Sum of PFHxS and PFOS have historically been recorded at OTH102 and OTH105. No detections of PFOA or Sum of PFHxS and PFOS above the LOR were recorded during this monitoring period.

A summary of the PFOA and Sum of PFHxS and PFOS concentrations for the monitoring period and the historical concentration ranges for the seepage water monitoring locations are presented in Table 7-9. It is noted that the results are below the LOR and therefore the results have not been plotted.

Table 7-9 Seepage Water PFOS, Sum of PFHxS and PFOS, and PFOA Concentrations

Location ID	Analyte	Historical range	OMP Monitoring Event	
		Min – Max (µg/L)	Nov 2022 (µg/L)	Jun 2023 (µg/L)
OTH101	PFOS	<0.001 – <0.01	<0.01	<0.01
	PFHxS and PFOS	<0.001 – <0.01	<0.01	<0.01
	PFOA	<0.001 – <0.01	<0.01	<0.01
OTH102	PFOS	<0.001 – 0.01	<0.01	<0.01
	PFHxS and PFOS	<0.001 – 0.01	<0.01	<0.01
	PFOA	<0.001 – <0.01	<0.01	<0.01
OTH103	PFOS	<0.001 – <0.01	<0.01	<0.01
	PFHxS and PFOS	<0.001 – <0.01	<0.01	<0.01
	PFOA	<0.001 – <0.01	<0.01	<0.01
OTH104	PFOS	<0.001 – <0.01	<0.01	<0.01
	PFHxS and PFOS	<0.001 – <0.01	<0.01	<0.01
	PFOA	<0.001 – <0.01	<0.01	<0.01
OTH105	PFOS	<0.001 – 0.067	<0.01	<0.01
	PFHxS and PFOS	<0.001 – <0.01	<0.01	<0.01
	PFOA	<0.001 – <0.01	<0.01	<0.01
OTH106	PFOS	<0.001 – <0.01	<0.01	<0.01
	PFHxS and PFOS	<0.001 – <0.01	<0.01	<0.01
	PFOA	<0.001 – <0.01	<0.01	<0.01

New Maximum | New Minimum | New Exceedance

7.3 Surface Water

7.3.1 Surface Water Physicochemical parameters

Surface water physicochemical parameters recorded during the November 2022 and June 2023 monitoring events are summarised in Table 7-10 and provided within Table 5, Appendix D.

Table 7-10 Surface water Physicochemical Parameters

Parameter	November 2022	June 2023
DO	0 mg/L (SW181) *Anaerobic conditions.*	6.4 mg/L (SW181) *Aerobic conditions.*
EC	108,660 µS/cm (SW181)	56,781 µS/cm (SW181)
pH	8.15 (SW181) *Alkaline conditions.*	7.85 (SW181) *Alkaline conditions.*
ORP	183.4 mV (SW181) *Oxidising conditions.*	123.1 mV (SW181) *Oxidising conditions.*

Note: * corrected ORP values (i.e. field reading + 200mV)

7.3.2 Surface Water Results Summary

Surface water is sampled (when present) across the Pathway 2 and Receptor B Areas to assess PFAS concentrations in surface water.

A summary of the PFOA and Sum of PFHxS and PFOS concentrations for the monitoring period and the historical concentration ranges for the surface water monitoring locations are presented in Table 7-11. It is noted that all the sample locations with the exception of SW181 were dry during the monitoring events and therefore the results have not been plotted.

SW165, SW179, SW167, SW169, SW171 and SW173 have always been dry during monitoring events and therefore no surface water data is available for these monitoring locations.

Table 7-11 Surface Water PFOS, Sum of PFHxS and PFOS, and PFOA Concentrations

Location ID	Analyte	Historical range	OMP Monitoring Event	
		Min – Max (µg/L)	Nov 2022 (µg/L)	Jun 2023 (µg/L)
SW161	PFOS	<0.001 – 0.008	Dry	Dry
	PFHxS and PFOS	<0.001 – 0.008		
	PFOA	<0.001 - <0.01		
SW162	PFOS	<0.001 – 0.003	Dry	Dry
	PFHxS and PFOS	<0.001 – <0.01		
	PFOA	<0.001 - <0.01		
SW163	PFOS	<0.001 – 0.008	Dry	Dry
	PFHxS and PFOS	<0.001 – 0.008		
	PFOA	<0.001 - <0.01		
SW164	PFOS	0.02 – 0.13	Dry	Dry
	PFHxS and PFOS	0.02 – 0.20		
	PFOA	0.002 – 0.01		
SW181	PFOS	<0.01 - 0.005	<0.01	<0.01
	PFHxS and PFOS	<0.01 - 0.07	<0.01	<0.01
	PFOA	<0.001	<0.01	<0.01
New Maximum		New Minimum	New Exceedance	

7.4 Sediment

A summary of the PFOS, PFOA and Sum of PFHxS and PFOS concentrations for the monitoring period and the historical concentration ranges for the sediment sampling locations are presented in Table 7-12. It is noted that the results are predominantly below laboratory LOR and therefore the results have not been plotted.

Table 7-12 Sediment PFOS, Sum of PFHxS and PFOS, and PFOA Concentrations

Location ID	Analyte	Historical range	OMP Monitoring Event	
		Min – Max (mg/kg)	Nov 2022 (mg/kg)	Jun 2023 (mg/kg)
SS161	PFOS	<0.0001	<0.0002	<0.0002
	PFHxS and PFOS	<0.0001	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002
SS162	PFOS	<0.0001	<0.0002	<0.0002
	PFHxS and PFOS	<0.0001	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002
SD163	PFOS	<0.0001	<0.0002	<0.0002
	PFHxS and PFOS	<0.0001	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002
SS164	PFOS	0.0003 – 0.0345	0.0007	0.0005
	PFHxS and PFOS	0.0003 – 0.0347	0.0009	0.0005
	PFOA	<0.0001 – 0.0004	<0.0002	<0.0002
SS165	PFOS	<0.0002 – 0.0084	0.0012	0.0052
	PFHxS and PFOS	<0.0002 – 0.0091	0.0012	0.0052
	PFOA	<0.0002 - 0.0005	<0.0002	<0.0002
SS167	PFOS	<0.0002 – 0.0027	<0.0002	<0.0002
	PFHxS and PFOS	<0.0002 – 0.0027	<0.0002	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002
SS169	PFOS	<0.0001 – 0.0032	0.0009	<0.0002
	PFHxS and PFOS	<0.0001 – 0.0016	0.0009	<0.0002
	PFOA	<0.0001	<0.0002	<0.0002
SS171	PFOS	<0.0001 – 0.0056	<0.0002	0.0010
	PFHxS and PFOS	<0.0001 – 0.0056	<0.0002	0.0010
	PFOA	<0.0002	<0.0002	<0.0002
SS173	PFOS	<0.0002 – 0.0008	<0.0002	<0.0002
	PFHxS and PFOS	<0.0002 – 0.0008	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002
SS179	PFOS	<0.0002	<0.0002	<0.0002
	PFHxS and PFOS	<0.0002	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002
SD181	PFOS	<0.0002 -0.0006	<0.0002	<0.0002
	PFHxS and PFOS	<0.0002 -0.0006	<0.0002	<0.0002
	PFOA	<0.0002	<0.0002	<0.0002

New Maximum | New Minimum | New Exceedance

PFAS concentrations were reported above the LOR at SS164, SS165, SS169 and SS171 located along Pathway 2, during at least one event of the monitoring period. All the concentrations reported within the monitoring period were within the historical range.

8 Interpretive Analysis

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

Potential trends in concentrations, including Mann Kendall trend analysis, and PFAS movement are discussed in the following sections.

Trends in concentrations over time have been assessed using the Mann Kendall trend analysis. A minimum of four results per monitoring location are required to calculate a trend (i.e. increasing, stable or decreasing). The Mann Kendall trend analysis relies on three statistical metrics (GSI, 2012), as follow:

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

8.1 Source Areas

Groundwater flow direction, interpreted from Standing Water Level (SWL) data collected during monitoring events, indicates that groundwater is generally flowing from the site infrastructure towards the Indian Ocean (Exmouth Gulf), to the east.

Generally, the PFAS concentrations for the source area monitoring wells were consistent between each monitoring event and historical concentrations. The data from the monitoring wells onsite confirm the understanding of PFAS impacts and source areas identified during the DSI.

All wells across the source areas recorded PFOS concentrations above the LOR (therefore above the ecological Marine-99% criteria) in November 2022 and June 2023 except for MW134, MW145, MW147, and MW148, which are cross-gradient from the Source Area North, and MW135 (considered background) and MW315 (up-gradient) from the Source Area South.

PFOA was reported above the LOR during both November 2022 and June 2023 events in most source area wells, with exception of MW134, MW145, MW147, and MW148S in Source Area North, and MW135, MW315 and MW113 (June 2023) in Source Area South. However, there was no PFOA exceedance of the ecological Marine-99% or human health Recreational Use criteria.

The Sum of PFHxS and PFOS was reported above the adopted human health and ecological assessment criteria in several source area wells during both November 2022 and June 2023 events. Source Area South reported the highest Sum of PFHxS and PFOS concentrations, with wells MW103D, MW115, MW142, MW143, MW144S and MW310 consistently exceeding the Recreational Use criteria since commencement of monitoring. Source Area North reported the highest Sum of PFHxS and PFOS concentrations at MW105S located within the Fire Training Area which has consistently exceeded the Recreational Use criteria since commencement of monitoring.

Trends in PFAS concentrations (Mann Kendall trend analysis) have been calculated for each well that has sufficient temporal data (i.e., a minimum of four results). Groundwater monitoring data recorded between February 2018 and June 2023 was used for the assessment, with outputs presented in Appendix D. Groundwater monitoring well trends for PFOA and the Sum of PFHxS and PFOS are summarised in Table 8-1.

Table 8-1 Mann-Kendall Trend Analysis Summary – Source Areas North and South

Source Area	Location	PFOS Trend	Confidence Factor (%)	PFOA Trend	Confidence Factor (%)	Sum of PFHxS & PFOS Trend	Confidence Factor (%)
Source Area North	MW105S	No Trend	29	No Trend	89	No Trend	61
	MW108	No Trend	<1	No Trend	63	Possibly Increasing	91
	MW134	Possibly Decreasing	91	No Trend	84	No Trend	56
	MW145	No Trend	82	No Trend	82	No Trend	82
	MW147	No Trend	81	NA(1)	NA(1)	No Trend	81
	MW148S	No Trend	85	NA(1)	NA(1)	No Trend	85
	MW326	No Trend	90	No Trend	80	Increasing	96
Source Area South	MW103D	Decreasing	>99	Decreasing	96	Decreasing	>99
	MW113	No Trend	<1	Stable	23	Stable	85
	MW115	Increasing	96	Possibly Increasing	93	Increasing	95
	MW122	No Trend	88	Stable	17	Stable	65
	MW126	No Trend	25	No Trend	75	No Trend	25
	MW135	Possibly Decreasing	92	No Trend	82	No Trend	67
	MW142	No Trend	25	No Trend	17	No Trend	88
	MW143	No Trend	25	No Trend	17	Stable	<1
	MW144S	No Trend	75	No Trend	82	No Trend	65
	MW310	Increasing	95	Increasing	96	Possibly Increasing	93
	MW311	Stable	75	Stable	54	Stable	75
	MW315	No Trend	39	NA(1)	NA(1)	No Trend	<1

Note:

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

(2) Results <LOR have been replaced by 0 for the Mann Kendall trend analysis.

The results of the Mann-Kendall trend analysis for PFOA, PFOS and Sum of PFHxS, and PFOS reported a stable or no statistically significant trend for a majority of monitoring wells in both source areas. The following exceptions are noted at Source Area South:

- An increasing PFOS trend was observed at MW115 (Fire Extinguisher Training Area) and MW310 (Possible AFFF Storage and Training Area) in Source Area South. This may indicate the source area continue to contribute to PFAS concentrations observed in groundwater.
- An increasing PFOA trend was observed at MW310 (Possible AFFF Storage and Training Area). A possibly increasing PFOA trend was observed at MW115 (Fire Extinguisher Training Area). This may indicate PFAS continue to migrate with groundwater from the Fire Extinguisher Training Area.
- Increasing Sum of PFHxS and PFOS trends were observed at MW115 (Fire Extinguisher Training Area) and MW326 (Class IV Landfill). Possibly increasing Sum of PFHxS and PFOS trends were observed at MW108 (Fire Department Training Area) and MW310 (Possible AFFF storage and training area).
- Decreasing PFOS, PFOA and Sum of PFHxS and PFOS trends were observed at MW103D (Former Fire Training Area).

Evidence of PFAS concentrations depletion within the Former Fire Training Area is noted with decreasing trends observed at MW103D on the edge of the Source Area South for a third monitoring period in a row.

However further monitoring is required to confirm if the decreasing trends persist and are observed at other source area monitoring wells. MW134 and MW135 (background/up-gradient) are also showing possibly decreasing PFOS trends however this is related to the change in laboratory LOR between the DSI and the OMP (from 0.0001 to 0.01 µg/L).

Increasing trends at MW115 (Fire Extinguisher Training Area), MW310 (Possible AFFF storage and training area down-gradient of site) and MW326 (Class IV Landfill) were reported with high confidence. MW108 (Fire Department Training Area) reported possibly increasing Sum of PFOS and PFHxS trends. These are likely isolated trends and PFAS doesn't not appear to be increasing at surrounding/down-gradient locations.

Overall, the groundwater monitoring results for majority of monitoring wells do not suggest a significant change in the understanding of contamination or risk at these locations and the current monitoring network is considered adequate to monitor Source Areas. However, ongoing monitoring is recommended, particularly of the wells showing increasing trends in the Class IV landfill and Fire Extinguisher Training area.

8.2 Offsite Pathways and Receptors

The PFAS concentrations for the offsite Pathway and Receptor Area monitoring wells were generally consistent between each monitoring event and historical concentrations.

PFOS was recorded above the LOR (and therefore ecological criteria) at MW154S and MW137 (June 2023) within Pathway 1, and MW022, MW118D and MW133 within Pathway 2.

PFOA was reported above the LOR at MW154S within Pathway 1, and MW118D and MW022 within Pathway 2, however no guideline exceedances were reported.

Sum of PFHxS and PFOS concentrations were reported above the LOR during both events at MW154S and MW137 (June 2023 only) within Pathway 1, MW022, MW133 and MW118D within Pathway 2, and MW132 within Receptor A. The concentrations were below Recreational Use criteria with exception of wells MW022 and MW118D, situated within 100 m of the site boundary within Pathway 2.

Trends in PFAS concentrations (Mann-Kendall trend analysis) have been calculated for each well that has sufficient temporal data (i.e. a minimum of four results). Groundwater monitoring data recorded between February 2018 and June 2023 was used for the assessment, with outputs presented in Appendix D. Groundwater monitoring well trends for PFOA and the Sum of PFHxS and PFOS are summarised in Table 8-2.

Table 8-2 Mann-Kendall Trend Analysis Summary – Pathway Areas 1 and 2, and Receptor A

Source Area	Location	PFOS Trend	Confidence Factor (%)	PFOA Trend	Confidence Factor (%)	Sum of PFHxS & PFOS Trend	Confidence Factor (%)
Pathway 1	MW137	No Trend	31	No Trend	85	No Trend	53
	MW151S	NA(1)	NA(1)	NA(1)	NA(1)	NA(1)	NA(1)
	MW152S	NA(1)	NA(1)	NA(1)	NA(1)	NA(1)	NA(1)
	MW153S	NA(1)	NA(1)	NA(1)	NA(1)	NA(1)	NA(1)
	MW154S	Increasing	95	Increasing	98	Increasing	99
	MW155S	NA(1)	NA(1)	NA(1)	NA(1)	NA(1)	NA(1)
Pathway 2	MW022	No Trend	53	Stable	25	Stable	<1
	MW118D	Decreasing	>99	Decreasing	>99	Decreasing	>99
	MW133	Stable	22	Possibly Decreasing	95	No Trend	14
Receptor A	MW128	No Trend	20	NA(1)	NA(1)	No Trend	51
	MW129	No Trend	51	NA(1)	NA(1)	No Trend	51
	MW130	Decreasing	97	NA(1)	NA(1)	Decreasing	97
	MW131	Possibly Decreasing	91	NA(1)	NA(1)	No Trend	56
	MW132	No Trend	70	Decreasing	96	No Trend	80

Note: (1) Trend Not Analysed – no detection above the laboratory LOR. Can be considered "stable" for the purpose of trend analysis.
(2) Results <LOR have been replaced by 0 for the Mann Kendall trend analysis.

The results of the Mann-Kendall trend analysis for PFOA, PFOS and Sum of PFHxS and PFOS indicates that PFAS concentrations display a stable or no statistically significant trend, with the following exceptions:

- MW118D located along Pathway 2 indicated decreasing trends in PFOA, PFOS and Sum of PFHxS and PFOS. As the drainage channel has been dry throughout the monitoring period, it is suggestive that migration of PFAS with infiltration from surface water into groundwater was the main contribution at this location. Concentrations remain, however, above human health and ecological assessment criteria at this location.
- MW154S, located down-gradient of Source Area South within Pathway 1 reported increasing trends of PFOA, PFOS and Sum of PFHxS and PFOS during this monitoring period. The increasing trend is seen in the concentrations of Sum of PFHxS and PFOS plotted in Figure 7-3, where the concentration has shown to steadily increase since 2018, to 2.0 µg/L in November 2022 (Cardno, 2022d). It is noted that concentrations appear to have stabilised over the last three monitoring events and there is no downgradient evidence of PFAS migration.
- Decreasing trends were identified at MW130, MW131 and MW132 (Receptor A) with no concentrations above the LOR reported at MW130 and MW131 during this monitoring period and the 2022 OMR (Cardno, 2022d).

The 2022 OMR (Cardno, 2022d) reported that the increasing trends in PFAS seen at MW154S were likely associated with PFAS movement in groundwater. However, Mann Kendall trend analysis for MW132, positioned further downgradient, indicated no trend (i.e. considered stable) for PFOS and Sum of PFOS and PFHxS, while PFOA was indicated to be decreasing. The results of the 2023 OMR are consistent with this assessment, there is no further evidence of PFAS migration, the increase recorded at MW154S appears limited to the vicinity of this monitoring well.

All seepage water monitoring locations reported PFAS concentrations below the laboratory LOR during the OMP monitoring events indicating there is no detectable PFAS discharge from groundwater to the Exmouth Gulf.

PFAS concentrations reported at SW181 were below the LOR. SW181 is located at the eastern end of Pathway 2, at the discharge point of the main drainage channel from site into the Exmouth Gulf. All other surface water locations along Pathway 2 were found to be dry. Due to the ephemeral presence of surface

water in the drain (related to heavy rainfall events), and the results at SW181, it is interpreted that minimal PFAS migration (if any) from the site and discharge into the Exmouth Gulf would be occurring via surface water.

PFOS concentrations recorded above the LOR in sediment samples located along Pathway 2 are generally associated with SS164 and SS165 which are located the closest to the site, at the start of the drainage channel. The co-located surface water locations were dry during the monitoring period.

PFOS concentrations in sediment samples collected from SS161, SS162 and SD163 (Receptor B – Backwater Lagoon) have consistently been reported below the LOR since sampling commenced. PFOS concentrations at the co-located surface water locations have historically been reported below the 0.01 µg/L LOR when sampled.

No change in PFAS concentrations and distribution in relation to the main aquatic receptors has occurred since the commencement of the OMP.

9 Conceptual Site Model

The evaluation of analytical results within this report does not suggest the nature and extent of PFAS in groundwater, seepage water, surface water or sediment has significantly changed compared to that inferred from previous data.

The understanding of onsite source areas presented in the investigation phase (GHD, 2018) is supported by the OMP monitoring data presented in this report. The predominant stability in PFAS trends in groundwater at the pathway and receptor wells also suggest the risk profile of these locations do not appear to be changing significantly. Even though increasing trends have been observed, these are either within already identified source areas, or limited to one isolated location with no further evidence of PFAS migration at down-gradient locations.

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

The data presented in this report does not change the understanding of the Conceptual Site Model (CSM). Future monitoring will continue to contribute to an evaluation of any potential changes to the CSM understanding.

10 Discussion

10.1 OMP Management Response Triggers

The OMP (Defence, 2019) includes triggers and contingency actions to assess if a more active response is required to manage changes in PFAS contamination. None of the management response triggers were observed during the monitoring period as:

- PFAS was not detected at a location where it had not been previously detected (i.e. no first-time detections were reported during the monitoring period).
- The average and median PFAS concentrations for each Pathway/Receptor monitoring zones remained of the same order of magnitude as historical data.

Ongoing monitoring is considered to still be an appropriate management approach for the site.

10.2 Risk Profile

The Ecological Risk Assessment (ERA) (GHD, 2019) determined that:

- PFAS poses a low risk to lower trophic level terrestrial and marine aquatic organisms across the Management Area;
- PFAS poses a low risk with respect to the potential for bioaccumulation in avian food chains across the Management Area, including the terrestrial environments of the Base and Exmouth Gulf;
- PFAS poses a low risk with respect to the potential for bioaccumulation and biomagnification in marine mammals. While the PFAS concentrations estimated for fish in the nearshore environment of Exmouth Gulf (using beach seepage water PFAS concentrations) marginally exceeded the NEMP mammalian wildlife dietary guideline, the low rates of groundwater discharge into Exmouth Gulf and the resulting high levels of dilution and dispersion support the conclusion that the concentrations in fish will be less than estimated and that PFAS poses a low risk with respect to bioaccumulation and biomagnification; and
- PFAS poses a low risk to marine turtles that could potentially nest along the beaches of the Management Area.

It was concluded that the information gathered during the ERA supported the conclusion made in the DSI, that PFAS poses a low risk to recreational anglers with respect to bioaccumulation in commonly caught fish species, and that PFAS poses a low risk to the commercial prawn fisheries of the Exmouth Gulf Managed Prawn Fishery (EGMPF).

The data evaluated in this report does not indicate changes to the nature and extent of PFAS in groundwater, surface water and/or sediment which alter the CSM understanding.

Based on the current available data, including data collected as part of the implementation of the OMP, there is no change to the risk profile of the Management Area. Specifically, no change in PFAS concentrations and distribution in relation to the main aquatic receptors has occurred since the commencement of the OMP.

Any potential future changes in groundwater, surface water, and sediment PFAS concentrations will continue to be evaluated through monitoring and reporting.

10.3 Triggers for OMP Review

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

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

The November 2022 – October 2023 monitoring results did not identify a change in the risk profile for the Management Area or the requirement for further management actions. Nevertheless, the OMP is currently being reviewed to assess the adequacy of the monitoring network and frequency of monitoring events, considering the OMP data collected to date.

11 Conclusions

Groundwater, surface water and sediment sampling were completed between November 2022 and October 2023 in general accordance with the SAQP (Cardno, 2023c). Data from the DSI (GHD, 2018) and previous monitoring periods (2020-2022) is included and considered in this report to inform trends in PFAS concentrations over time.

Overall, the concentrations of PFAS across the media and locations sampled are consistent with historical data. It is noted that surface water was only sampled from one location during the November 2022 – October 2023 monitoring period due to lower-than-average rainfall.

Some new minimums or maximums in PFAS concentrations were noted, however all were within the same order of magnitude as historical data. No first-time detection or new exceedance of a guideline value occurred during the monitoring period.

The nature and extent of PFAS across all media assessed has not changed from the understanding presented in the investigation phases and the PMAP. Possible trends in groundwater (both decreasing and increasing depending on the location and PFAS type under review) are noted:

- An increasing trend for Sum of PFOS and PFHxS at Source Area North well MW326.
- Decreasing trends for PFOS, PFOA and Sum of PFOS and PFHxS at Source Area South well MW103D.
- Increasing trends for PFOS and Sum of PFOS and PFHxS at Source Area South well MW115.
- Increasing trends for PFOS and PFOA at Source Area South well MW310.
- Increasing trends for PFOS, PFOA and Sum of PFOS and PFHxS at Pathway 1 well MW154S.
- Decreasing trends for PFOS, PFOA and Sum of PFOS and PFHxS at Pathway 2 well MW118D.
- Decreasing trends for PFOS and Sum of PFOS and PFHxS at Receptor A well MW130.
- Decreasing trends for PFOA at Receptor A well MW132.

There was indication in the 2022 OMR that PFAS could be migrating with groundwater towards the east and the north-east, however, no evidence of discharge into the Exmouth Gulf is observed as no seepage water sample recorded concentrations above the LOR during the monitoring period and no first-time detection or new maxima were recorded in Receptor A monitoring wells. Furthermore, decreasing trends are observed in monitoring wells targeting Receptor A.

The November 2022 - October 2023 monitoring results did not identify a change in the CSM understanding or risk profile of the Management Area.

None of the management response triggers presented in the OMP were exceeded during the monitoring period. The current management approach (ongoing monitoring) is considered appropriate for the level of risk (low and acceptable) of the Management Area.

The OMP is currently being reviewed to assess the adequacy of the monitoring network and frequency of monitoring events, considering the OMP data collected to date.

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APPENDIX

A

FIGURES

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NORTH WEST CAPE

EXMOUTH

CAPE RANGE NATIONAL PARK

Legend

Management Area

Site Boundary

FIGURE 1

1:100,000 Scale at A3

Metres

0 1,500 3,000

Site Location

2023 ONGOING MONITORING REPORT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

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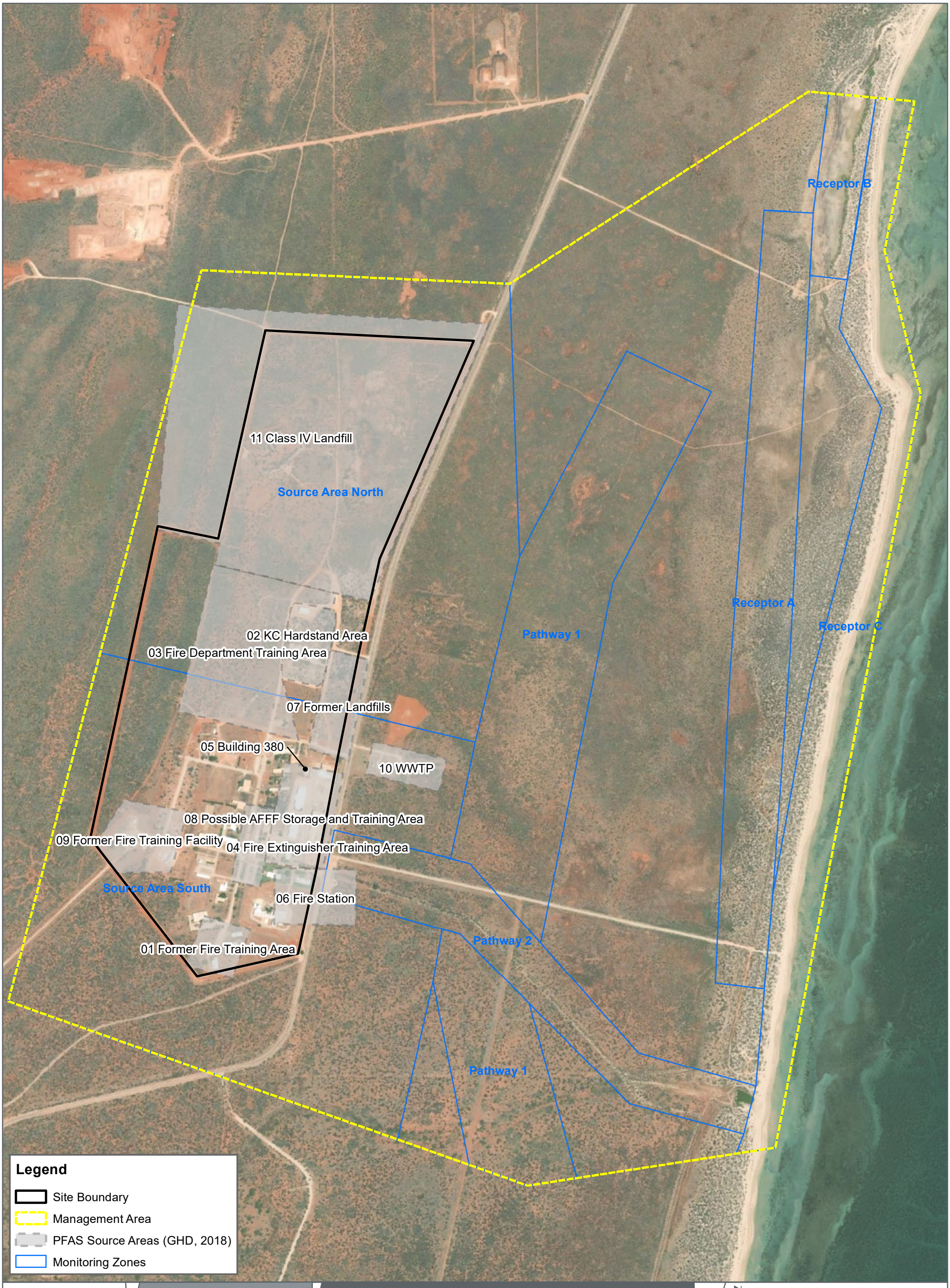


FIGURE 2

1:11,500 Scale at A3

Metres

0 250 500

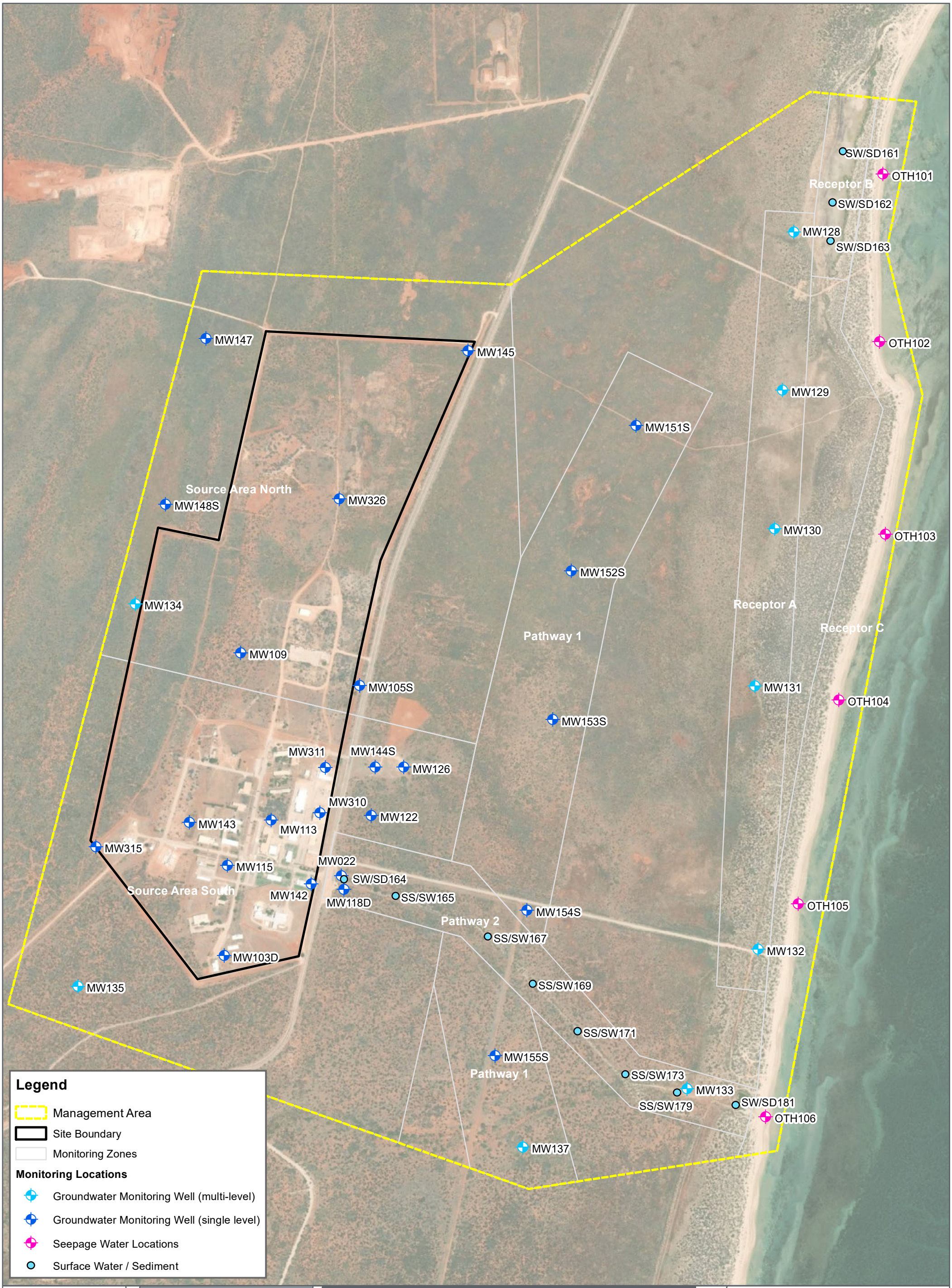
Management Area

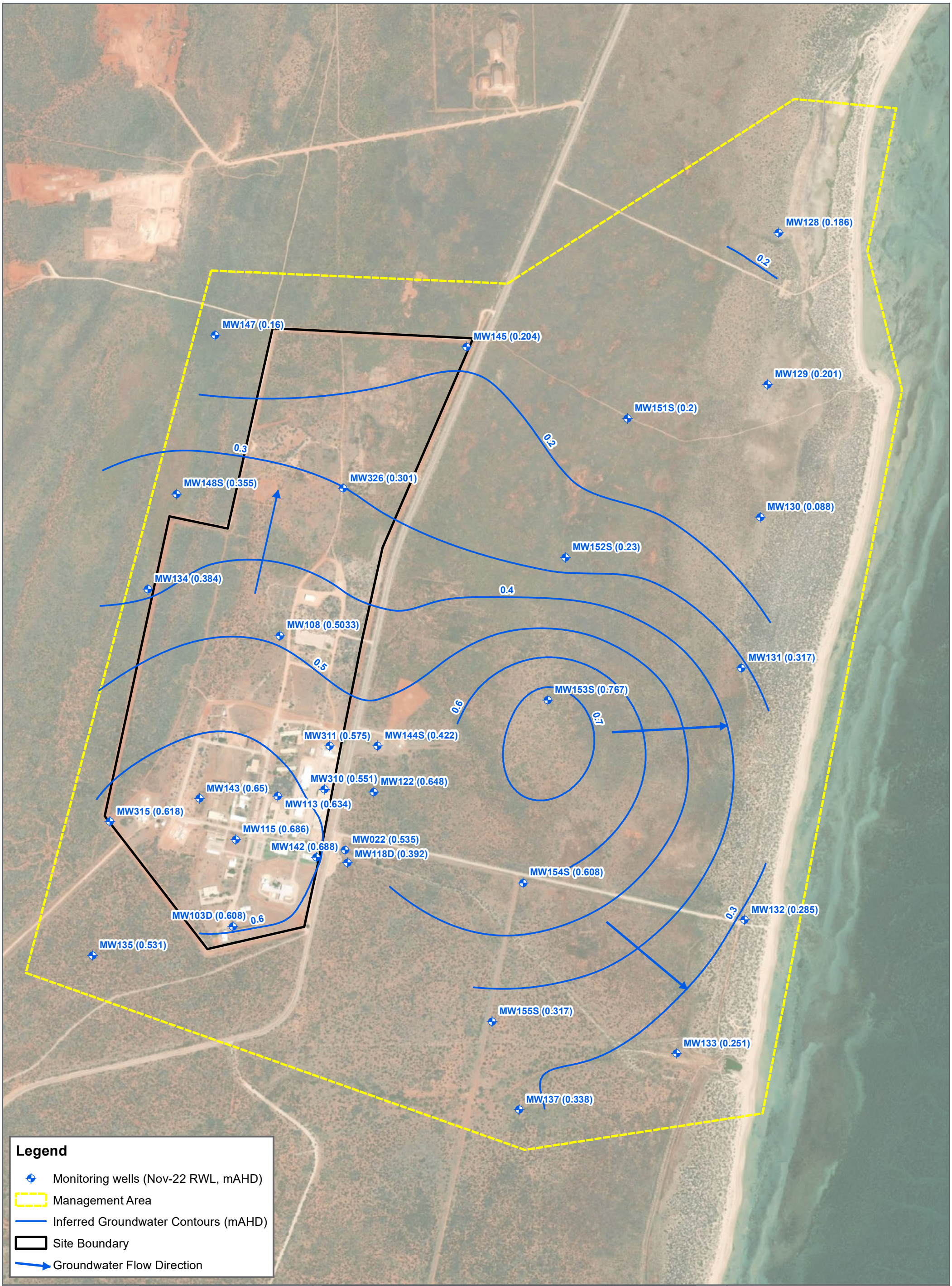
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HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

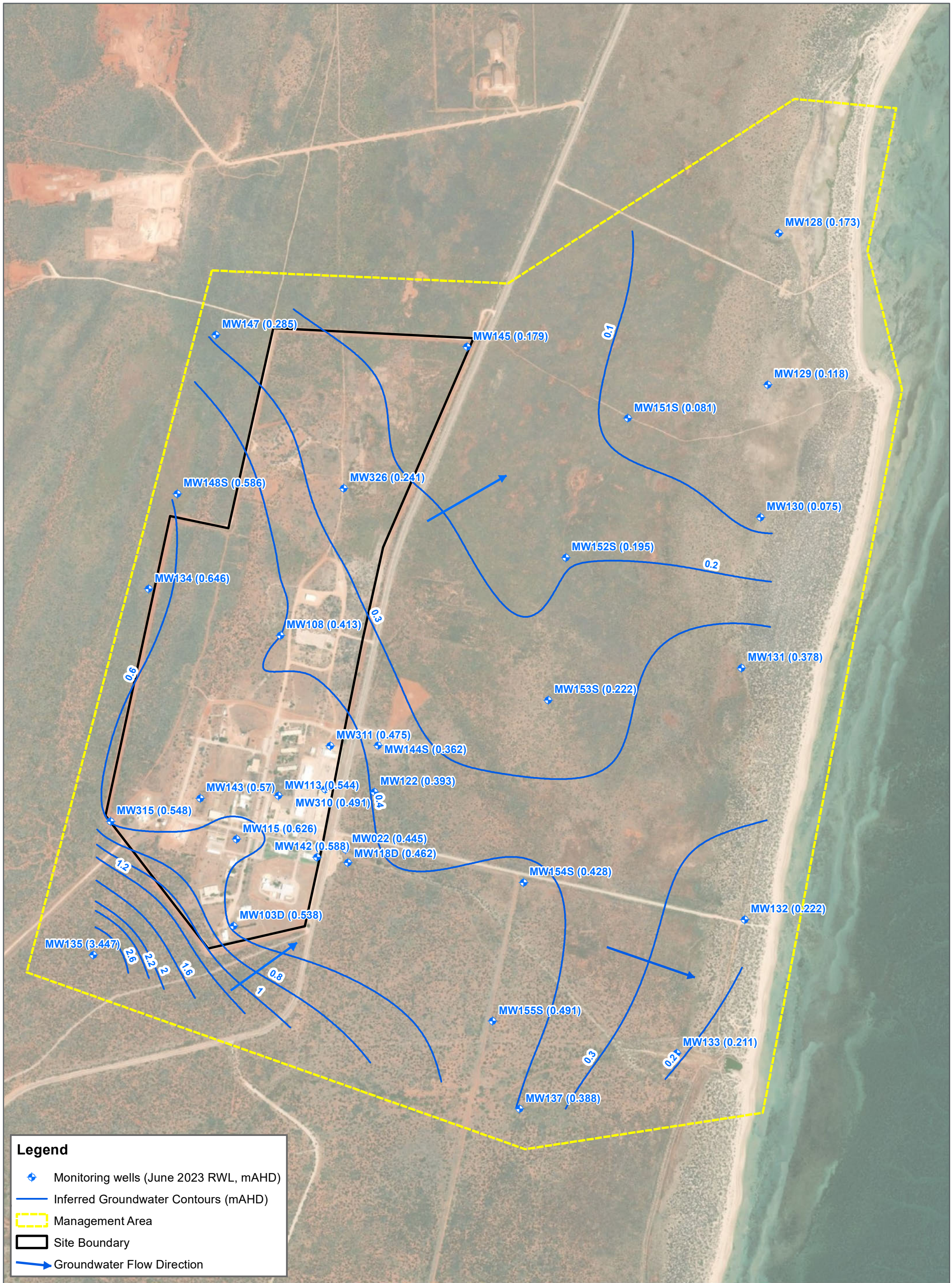
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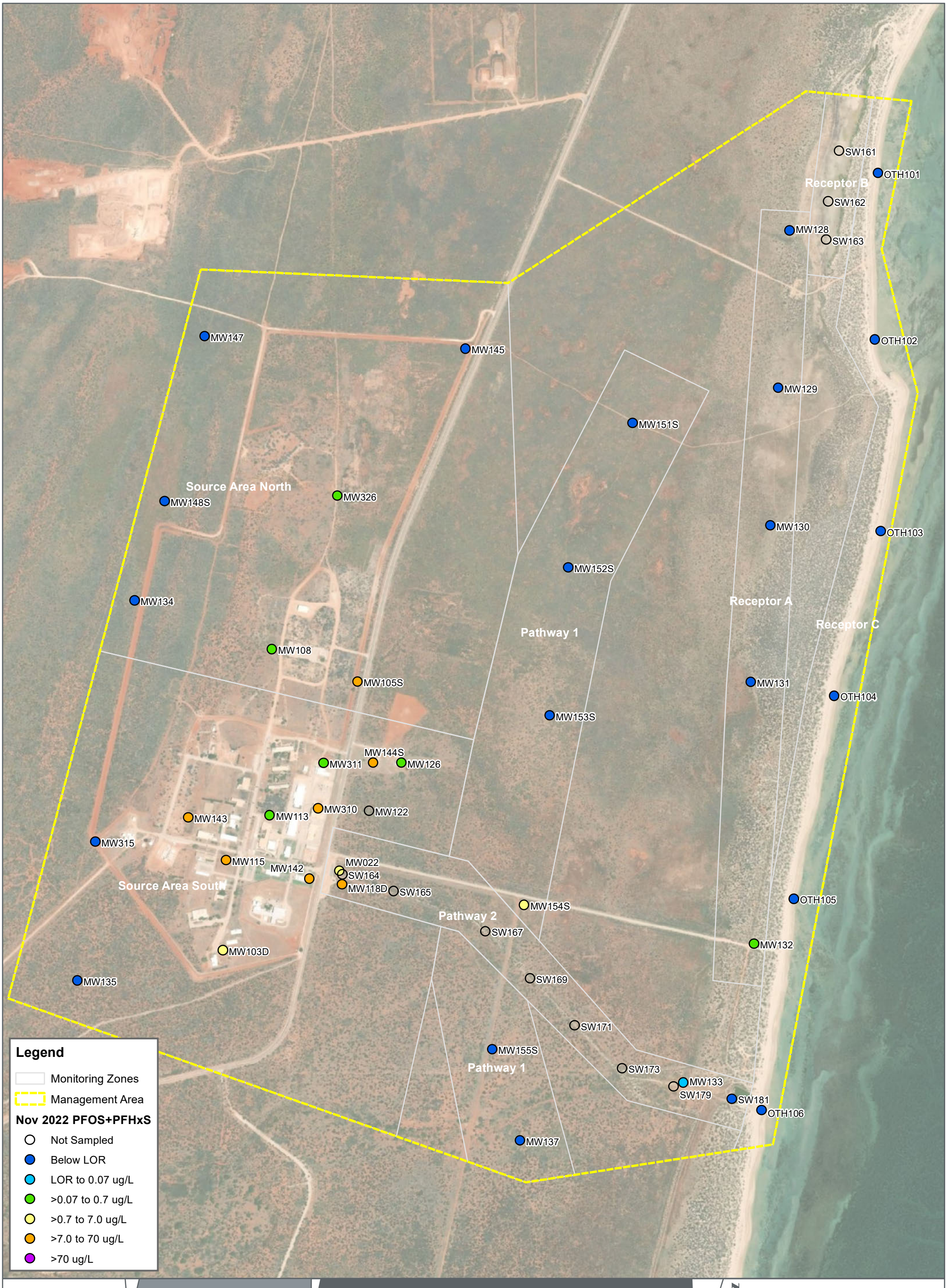
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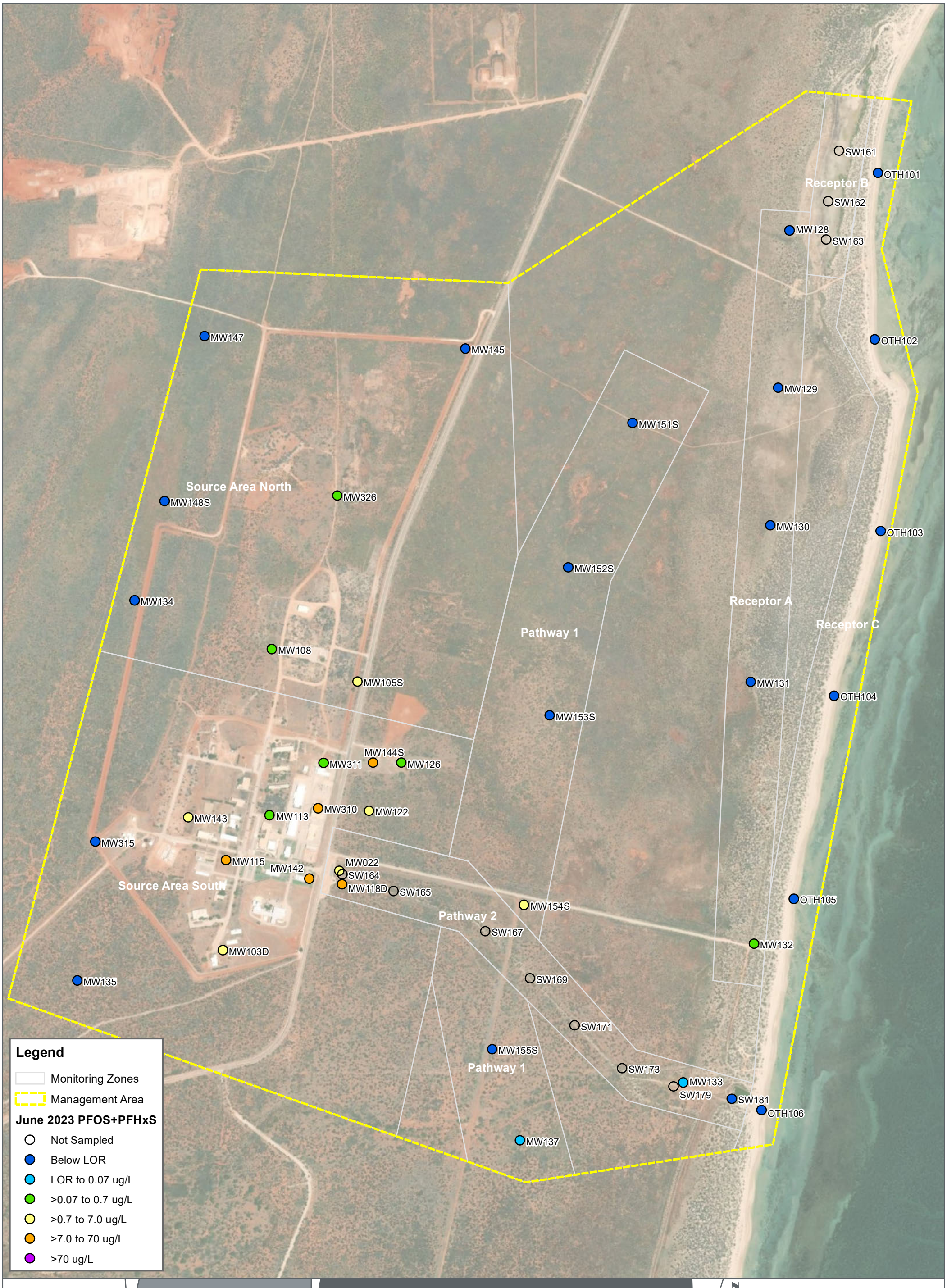
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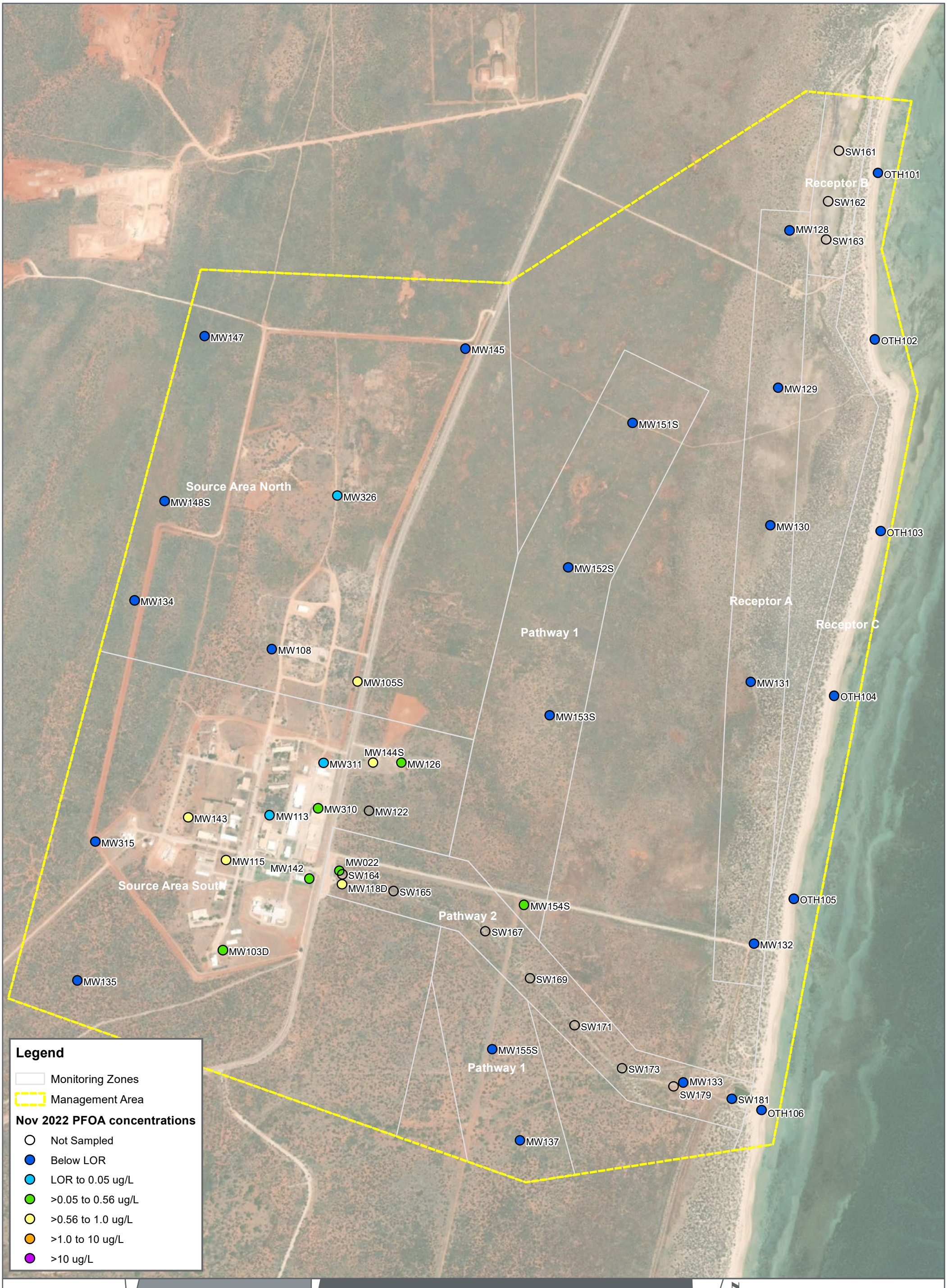

SW/SD161
OTH101
Receptor B
SW/SD162
MW128
SW/SD163
MW147
MW145
OTH102
MW129
MW151S
Source Area North
MW148S
MW326
MW130
OTH103
MW152S
MW134
Receptor A
Receptor C
Pathway 1
MW109
MW105S
MW131
OTH104
MW153S
MW311
MW144S
MW126
MW310
MW122
MW143
MW113
MW315
MW115
MW022
SW/SD164
Source Area South
MW142
MW118D
SS/SW165
MW154S
OTH105
Pathway 2
SS/SW167
MW132
MW103D
MW135
SS/SW169
SS/SW171
MW155S
Pathway 1
SS/SW173
MW133
SS/SW179
SW/SD181
OTH106
MW137
Legend
Management Area
Site Boundary
Monitoring Zones
Monitoring Locations
Groundwater Monitoring Well (multi-level)
Groundwater Monitoring Well (single level)
Seepage Water Locations
Surface Water / Sediment
FIGURE 3
1:11,500Scale at A3
Metres
0
250
500
Monitoring Locations
2023 ONGOING MONITORING REPORT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE
N
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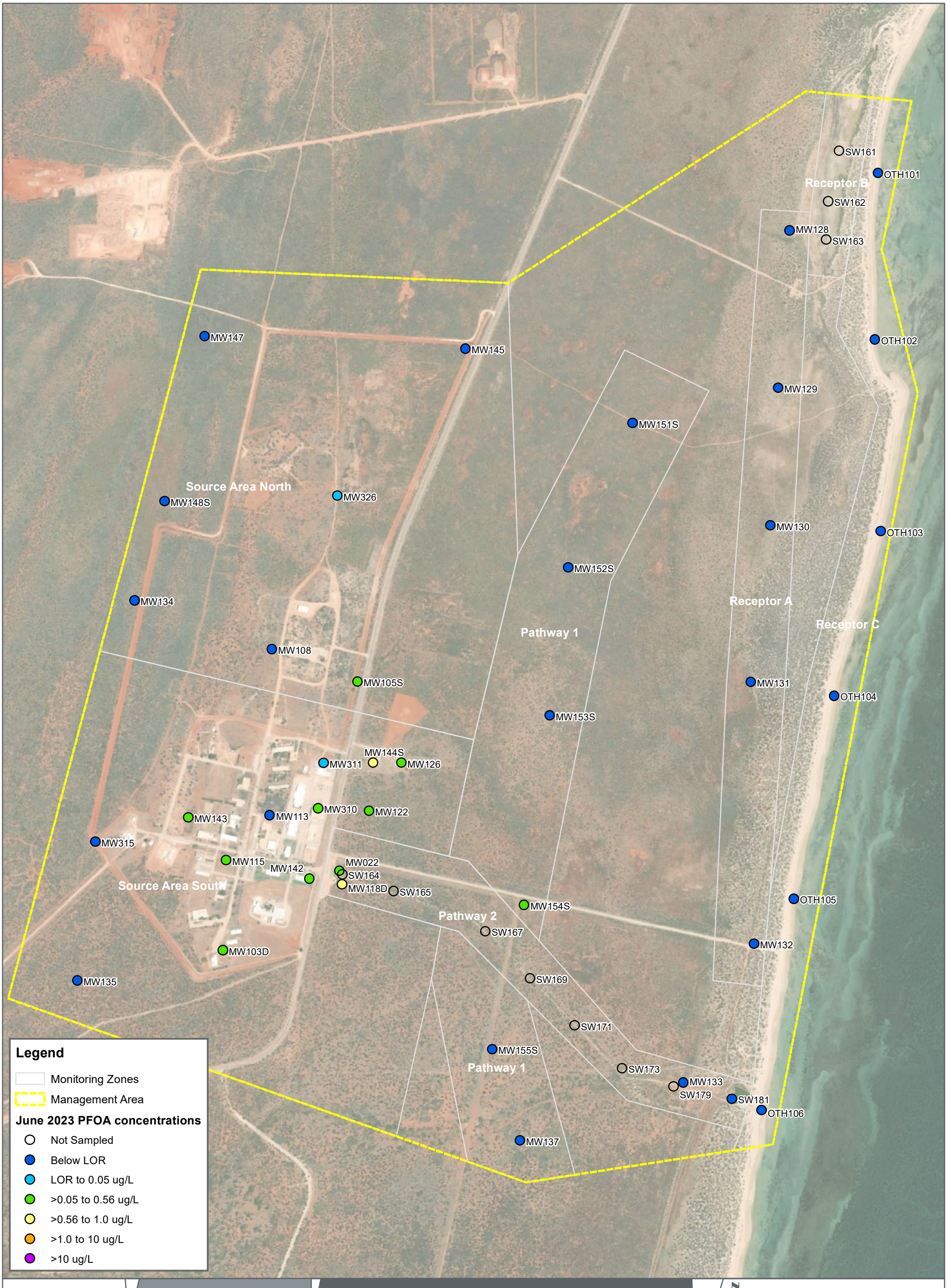

MW128 (0.186)
0.2
MW147 (0.16)
MW145 (0.204)
MW129 (0.201)
MW151S (0.2)
0.2
0.3
MW148S (0.355)
MW326 (0.301)
MW130 (0.088)
MW152S (0.23)
MW134 (0.384)
0.4
MW108 (0.5033)
0.5
MW131 (0.317)
MW153S (0.767)
0.6
1.0
MW311 (0.575)
MW144S (0.422)
MW310 (0.551)
MW122 (0.648)
MW143 (0.65)
MW113 (0.634)
MW315 (0.618)
MW115 (0.686)
MW022 (0.535)
MW142 (0.688)
MW118D (0.392)
MW154S (0.608)
MW103D (0.608)
0.6
0.3
MW132 (0.285)
MW135 (0.531)
MW155S (0.317)
MW133 (0.251)
MW137 (0.338)
Legend
Monitoring wells (Nov-22 RWL, mAHD)
Management Area
Inferred Groundwater Contours (mAHD)
Site Boundary
Groundwater Flow Direction
FIGURE 4
1:12,000 Scale at A3
Metres
0
250
500
Nov-22 Inferred Groundwater Contours
2023 ONGOING MONITORING REPORT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE
N
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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-004_GroundwaterContoursNov-22 01.mxd
Aerial Imagery Supplied by Google Earth


MW128 (0.173)
MW147 (0.285)
MW145 (0.179)
0.1
MW129 (0.118)
MW151S (0.081)
MW148S (0.586)
MW326 (0.241)
MW130 (0.075)
MW152S (0.195)
0.2
MW134 (0.646)
MW108 (0.413)
0.3
MW131 (0.378)
0.6
MW153S (0.222)
MW311 (0.475)
MW144S (0.362)
MW143 (0.57)
MW113 (0.544)
MW122 (0.393)
MW310 (0.491)
0.4
MW315 (0.548)
MW115 (0.626)
MW022 (0.445)
MW142 (0.588)
MW118D (0.462)
1.2
MW154S (0.428)
MW132 (0.222)
MW103D (0.538)
MW135 (3.447)
2.6
2.2
2
1.6
0.8
1
MW155S (0.491)
MW133 (0.211)
0.3
0.2
MW137 (0.388)
Legend
Monitoring wells (June 2023 RWL, mAHD)
Inferred Groundwater Contours (mAHD)
Management Area
Site Boundary
Groundwater Flow Direction
FIGURE 5
1:12,000 Scale at A3
Metres
0
250
500
Jun-23 Inferred Groundwater Contours
2023 ONGOING MONITORING REPORT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE
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Cardno
Map Produced by Cardno WA
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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-005_GroundwaterContoursJun-23 01.mxd
Aerial Imagery Supplied by Google Earth


SW161
OTH101
Receptor B
SW162
MW128
SW163
MW147
MW145
OTH102
MW129
MW151S
Source Area North
MW148S
MW326
MW130
OTH103
MW152S
MW134
Receptor A
Receptor C
Pathway 1
MW108
MW105S
MW131
OTH104
MW153S
MW144S
MW311
MW126
MW143
MW113
MW310
MW122
MW315
MW115
MW142
MW022
SW164
MW118D
SW165
Source Area South
MW154S
OTH105
Pathway 2
SW167
MW132
MW103D
MW135
SW169
SW171
MW155S
Pathway 1
SW173
MW133
SW179
SW181
OTH106
MW137
Legend
Monitoring Zones
Management Area
Nov 2022 PFOS+PFHxS
Not Sampled
Below LOR
LOR to 0.07 ug/L
>0.07 to 0.7 ug/L
>0.7 to 7.0 ug/L
>7.0 to 70 ug/L
>70 ug/L
FIGURE 6
1:11,500 Scale at A3
Metres
0
250
500
PFOS+PFHxS concentrations - Nov-22
2023 ONGOING MONITORING REPORT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
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Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-006_PFOS+PFHxS_Nov22 01.mxd
Aerial Imagery Supplied by Google Earth


SW161
OTH101
Receptor B
SW162
MW128
SW163
MW147
MW145
OTH102
MW129
MW151S
Source Area North
MW148S
MW326
MW130
OTH103
MW152S
MW134
Receptor A
Receptor C
Pathway 1
MW108
MW105S
MW131
OTH104
MW153S
MW144S
MW311
MW126
MW143
MW113
MW310
MW122
MW315
MW115
MW142
MW022
SW164
MW118D
SW165
Source Area South
MW154S
OTH105
Pathway 2
SW167
MW132
MW103D
MW135
SW169
SW171
MW155S
Pathway 1
SW173
MW133
SW179
SW181
OTH106
MW137
Legend
Monitoring Zones
Management Area
June 2023 PFOS+PFHxS
Not Sampled
Below LOR
LOR to 0.07 ug/L
>0.07 to 0.7 ug/L
>0.7 to 7.0 ug/L
>7.0 to 70 ug/L
>70 ug/L
FIGURE 7
1:11,500 Scale at A3
Metres
0
250
500
PFOS+PFHxS concentrations - Jun-23
2023 ONGOING MONITORING REPORT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE
N
Cardno
Map Produced by Cardno WA
Date: 2024-06-26 | Project: DEF19009
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-007_PFOS+PFHxS_Jun23 01.mxd
Aerial Imagery Supplied by Google Earth


SW161
OTH101
Receptor B
SW162
MW128
SW163
MW147
MW145
OTH102
MW129
MW151S
Source Area North
MW148S
MW326
MW130
OTH103
MW152S
MW134
Receptor A
Receptor C
Pathway 1
MW108
MW105S
MW131
OTH104
MW153S
MW144S
MW311
MW126
MW143
MW113
MW310
MW122
MW315
MW115
MW142
MW022
SW164
MW118D
SW165
Source Area South
MW154S
OTH105
Pathway 2
SW167
MW132
MW103D
MW135
SW169
SW171
MW155S
Pathway 1
SW173
MW133
SW179
SW181
OTH106
MW137
Legend
Monitoring Zones
Management Area
Nov 2022 PFOA concentrations
Not Sampled
Below LOR
LOR to 0.05 ug/L
>0.05 to 0.56 ug/L
>0.56 to 1.0 ug/L
>1.0 to 10 ug/L
>10 ug/L
FIGURE 8
1:11,500 Scale at A3
Metres
0
250
500
PFOA concentrations - Nov-22
2023 ONGOING MONITORING REPORT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE
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Aerial Imagery Supplied by Google Earth


SW161
OTH101
Receptor B
SW162
MW128
SW163
MW147
MW145
OTH102
MW129
MW151S
Source Area North
MW148S
MW326
MW130
OTH103
MW152S
MW134
Receptor A
Receptor C
Pathway 1
MW108
MW105S
MW131
OTH104
MW153S
MW144S
MW311
MW126
MW143
MW113
MW310
MW122
MW315
MW115
MW142
MW022
SW164
MW118D
SW165
Source Area South
MW154S
OTH105
Pathway 2
SW167
MW132
MW103D
MW135
SW169
SW171
MW155S
Pathway 1
SW173
MW133
SW179
SW181
OTH106
MW137
Legend
Monitoring Zones
Management Area
June 2023 PFOA concentrations
Not Sampled
Below LOR
LOR to 0.05 ug/L
>0.05 to 0.56 ug/L
>0.56 to 1.0 ug/L
>1.0 to 10 ug/L
>10 ug/L
FIGURE 9
1:11,500 Scale at A3
Metres
0
250
500
PFOA concentrations - Jun-23
2023 ONGOING MONITORING REPORT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE
N
Cardno
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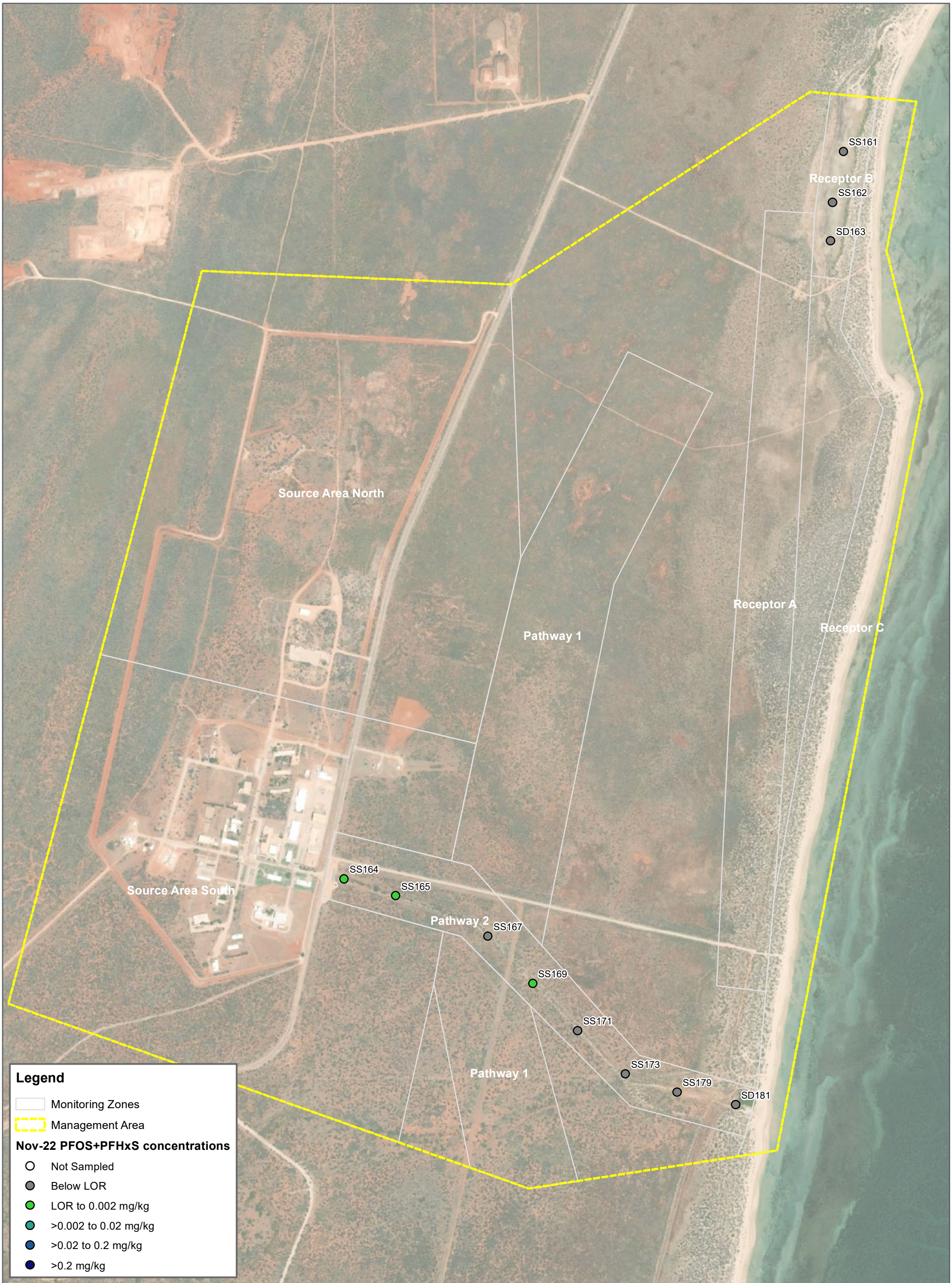


FIGURE 10

1:11,500 Scale at A3

Metres

0 250 500

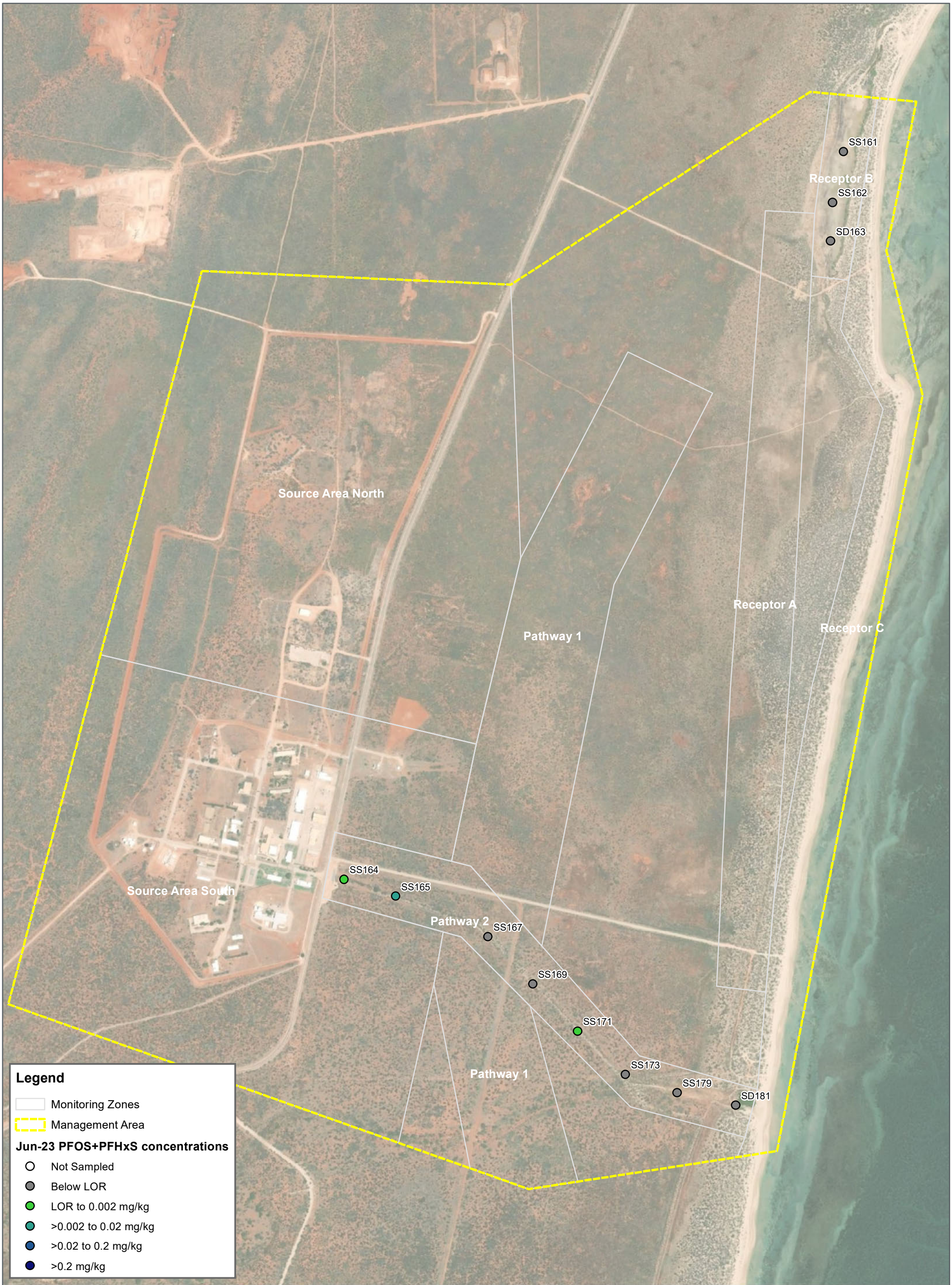
Sediment concentrations - Nov-22

2023 ONGOING MONITORING REPORT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

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Aerial Imagery Supplied by Google Earth


SS161
Receptor B
SS162
SD163
Source Area North
Pathway 1
Receptor A
Receptor C
SS164
SS165
Source Area South
Pathway 2
SS167
SS169
SS171
SS173
SS179
SD181
Pathway 1
Legend
Monitoring Zones
Management Area
Jun-23 PFOS+PFHxS concentrations
Not Sampled
Below LOR
LOR to 0.002 mg/kg
>0.002 to 0.02 mg/kg
>0.02 to 0.2 mg/kg
>0.2 mg/kg
FIGURE 11
1:11,500 Scale at A3
Metres
0
250
500
Sediment concentrations - Jun-23
2023 ONGOING MONITORING REPORT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE
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Aerial Imagery Supplied by Google Earth

APPENDIX

B

SAQP

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

Naval Communication Station Harold Holt B

Prepared for

Department of Defence

1 June 2023

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Appendix B Full PFAS Analytical Suite

1 Introduction

Cardno have been engaged by the Australian Department of Defence ('Defence' or 'Client') to prepare a Sampling and Analysis Quality Plan (SAQP) as part of the Ongoing Monitoring Plan (OMP), the purpose of which to monitor trends in the extent and concentrations of per- and poly-fluoroalkyl substances (PFAS) impacts identified on and around the Naval Communication Station Harold E Holt - Area B (HEH-B), Exmouth, Western Australia (Figure 1, Appendix A).

The OMP SAQP applies to not only HEH-B, but also the surrounding areas that, together with the Base, make up the "Management Area" (Figure 2, Appendix A). For the purposes of this report:

> "the site" was defined as Harold E Holt – Area B (Figure 1, Appendix A).

> "the Management Area" was defined as comprising the site, plus the land extending to Exmouth Gulf (to the east and north-east) (Figure 2, Appendix A).

The site is located on Commonwealth Land and is regulated under Commonwealth environmental legislation. The OMP outlines the rationale and scope for the monitoring of the concentrations and extent of PFAS in groundwater, seepage water, surface water and sediment originating from the site. The monitoring frequency aligns with the climate of the Management Area, which features the highest volume of rainfall typically between January and July and lower rainfall between September and December. An additional wet season sampling event ('First Flush') will be undertaken near the start of the wet season. Only surface water and sediment will be obtained in this event to attempt to obtain first flush samples. Groundwater and seepage water will not be sampled.

1.1 Purpose & Objectives

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

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

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

1.2 Previous Reports

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

> Department of Defence, May 2019, Naval Communication Station Harold E Holt – Area B *PFAS Management Area Plan*.

> Department of Defence, May 2019, Naval Communication Station Harold E Holt – Area B *PFAS Ongoing Monitoring Plan*.

> GHD Pty Ltd, December 2018, reference: 3135526, *Naval Communication Station Harold E Holt – Area B PFAS Investigations Detailed Site Investigation Report*.

> GHD Pty Ltd, May 2019, reference: 3135526, *Harold E Holt B Ecological Risk Assessment*.

> Cardno, April 2020, *PFAS OMP Biannual Monitoring Factual Report, 2019 Post-Winter, HEH-B*.

> Cardno, July 2020, *PFAS OMP First Flush Sampling Event Factual Report, May 2020, HEH-B*.

> Cardno, February 2021, *PFAS OMP Biannual Monitoring Factual Report, 2020 Post-summer, HEH-B*.

> Cardno, February 2021, *PFAS OMP Biannual Monitoring Factual Report, 2020 Post-winter, HEH-B*.

- Cardno, May 2021, *PFAS OMP First Flush Sampling Event Factual Report, March 2021, HEH-B*.
- Cardno, June 2021, *2020 Annual Interpretive Report, HEH-B*.
- Cardno, August 2021, *PFAS OMP Biannual Monitoring Factual Report, June 2021, HEH-B*.
- Cardno, April 2022, *PFAS OMP Biannual Monitoring Factual Report, November 2021, HEH-B*.
- Cardno, now Stantec, September 2022, *PFAS OMP First Flush Sampling Event Factual Report, May 2022, HEH-B*.
- Cardno, now Stantec, October 2022, *PFAS OMP Biannual Monitoring Factual Report, June 2022, HEH-B*.
- Cardno, now Stantec, February 2023, *PFAS OMP Biannual Monitoring Factual Report, November 2022, HEH-B*.
- Cardno, now Stantec, April 2023, *Draft 2021 Annual Interpretive Report*, *HEH-B.*

1.3 Responsible Parties

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

Table 1-1 Responsible Parties

Role	Responsibilities
Department of Defence – Directorate of PFAS Remediation (DPFASR) – Environment & Engineering Branch	▪ Implement this OMP. ▪ Engage suitably qualified environmental consultants/contractors to carry out the works specified in the OMP
HEHB – Base Support Manager/ Site Manager and Environment and Sustainability Manager	▪ Review and approve all necessary permits required for implementation of the works outlined in the OMP.
Environmental Consultant	▪ Obtain necessary permits from HEH-B to implement the works outlined in the OMP. ▪ Liaise with State regulators (e.g. Department of Biodiversity, Conservation and Attractions) to arrange sampling of off-site waterways, as required. ▪ Undertake the monitoring activities outlined in this SAQP. ▪ Produce a monitoring report that summarises the data and findings of each monitoring event and is consistent with the requirements of this SAQP. ▪ Produce an annual interpretive report including recommendations for any potential changes in the location and frequency of sampling which may be incorporated in the revision of the OMP. ▪ Upload analytical data from each monitoring event to the relevant Defence ESdat database.

1.4 Relevant Guidelines

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

- National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure (as amended 2013)* (ASC NEPM).
- Heads of Environmental Protection Authority's Australia and New Zealand (HEPA), January 2020, *PFAS National Environmental Management Plan (NEMP) 2.0*.
- Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils, Part 1 - Non-volatile and semi-volatile compounds*.
- Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling*.

- Australian and New Zealand Guidelines, 2018. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.*
- Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.
- U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process (EPA QA/G-4)*.
- USEPA, 2002, *Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8).*
- Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*[1].
- National Health and Medical Research Council (NHMR), August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.

1.5 Standards of Assessment and Limitations

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

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

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

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

2 Site Description and Management Areas

HEH-B is located approximately 1,250 km north of Perth, two kilometres north of Exmouth and covers an area of 2,020 hectares (ha). HEH-B was established in 1967 and is host to a High Frequency (HF) transmitter and associated administration facilities.

The site is situated at the end of the North West Cape of WA, at the northern edge of Exmouth. The majority of the buildings and associated infrastructure and support services are located in the northern portion of the site and include:

- HF transmitter.
- Base administration facilities.
- Service facilities including vehicle maintenance workshop.
- Former recreational and living quarters.
- Waste water treatment plant (WWTP).
- Water treatment plant (WTP).
- Firefighting services and training area (current and former).
- Landfill areas including Class IV landfill and asbestos landfill.
- Lease areas for non-military use including Sea Breeze Resort (no longer in active use).
- Other activities include former fuel storage and distribution, in above and below ground tanks and chemical storage (including paints and solvents).

2.1 Site Definition and Planning

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

Table 2-1 Site Identification Details

Details	Description
Site Address	Murat Rd, North West Cape, WA 6707
Land Description	Harold E Holt Area B
Owner	Commonwealth of Australia
Title Details	Lot 43 on Plan P209471 and Lot 78 on Plan P211955
Planning Zone / Land use	Public Purposes – Government Services
Local Government Authority (LGA)	Shire of Exmouth
Boundary corner coordinate (1) **(Eastings and Northings in GDA94, Zone 50)**	▪ North-west corner: 199,167 mE, 7,576,901 mN ▪ North-east corner: 205,188 mE, 7,577,210 mN ▪ South-west corner: 204,428 mE, 7,572,508 mN ▪ South-east corner: 199,212 mE, 7,574,561 mN

(1) As determined by Cardno

2.2 Surrounding Land Uses and Zoning

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

Table 2-2 Surrounding Land Uses

Direction	Land Use
North	Vacant crown land (open space)
West	Vacant crown land (open space); Ningaloo Marine Park further to the west
East	Exmouth Gulf; commercial prawn fishing
South	Exmouth Township

3 Environmental Setting

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

Table 3-1 Key Site Details

Setting	Description
Climate	The region has a hot, semi-arid climate, with a wet and dry season. Rainfall occurs generally between January and July with monsoonal showers between January and Late April. August to December is generally dry. The highest volume of rainfall typically occurs during the month of June.
Topography	Elevation across HEH-B typically range between 1 and 20 meters relative to the Australian Height Datum (m AHD). A natural ridge line runs north/south along the western boundary of the site, with the south-west portion of the site (specifically the water tower) being higher than the surrounding area.
Geology	**Regional Geology** The site is underlain by the geological units of the Northwest Cape range primarily comprising carbonate sediments. The Cape Range Group consists in: ▪ Trealla Limestone: permeable, hard and tightly jointed limestone beneath unconsolidated Quaternary deposits. Contains both karst areas and areas of recrystallization. ▪ Tulki Limestone: relatively permeable, hard and tightly jointed. Encountered at depths of 50 to 100 m below ground level (mbgl). Karst features such as caves occur within the recrystallised limestone. ▪ Mandu Limestone: low permeability limestone encountered at greater than 150 mbgl. ▪ The Birdrong Sandstone which underlies the Cape Range Group, comprising a fine to coarse grained silty sandstone. **Site Specific Geology** Previous environmental investigations have reported superficial colluvium, comprising poorly sorted clay, silt, sand and gravel. Logs indicated between one and six meters of red silty sand at the surface, below which the sand becomes more dense and weakly cemented in places with coral limestone or shell fragments.
Acid Sulfate Soil	A review of the Acid Sulfate Soils (ASS) risk mapping, available on the WA Atlas online database indicates that the area encompassing the site is classified as having no known ASS disturbance risk. The coastline to the east of the Base is mapped as having a high to moderate risk of ASS occurring.
Hydrology	HEH-B has a local ridge line along the western boundary of the site. A network of man-made, concrete lined drainage channels traverses the site, generally following the natural topography and exiting the site to the east beyond Murat Road. The majority of surface water run-off from the site therefore ultimately discharges to the coastline. However, a portion goes to the WWTP located on east of the site. The area to the east of the site, inland from the coastline, was observed to drain slowly after heavy rainfall. Areas of standing water were observed in low lying areas. Local surface water flow (including rainfall runoff) is expected to follow the local topography until it is either intersected by stormwater drainage systems on site, infiltrates the sub-surface, or collects at the backwater lagoon east of the site.
Hydrogeology	The Quaternary and Tertiary-aged sediments are hydraulically interconnected and together form the major, unconfined aquifer of the area. The superficial Quaternary layers (dunes, colluvium, alluvium) are considered to be no more than 20 m in thickness. Groundwater in the Quaternary units is considered to be perched and discontinuous. The coastal dunes may also contain relatively fresh groundwater but of limited extent (lenses). ▪ **Groundwater Occurrence/Quality** – The site consists of the following multi-layered aquifer system comprising of the following:

Setting	Description
	– Exmouth North – Carnarvon Cape Range Limestone (unconfined) – Exmouth North Saline Resource – Birdrong Recharge of the aquifers occurs through direct recharge from rainfall infiltration, and indirect recharge along drainage lines from occasional sea water flooding and stormwater runoff. Hydraulic conductivities in the aquifer are likely to be highly heterogeneous and depend on the permeability of the overlying colluvium in the Quaternary sediments, and the degree of fracturing and connectivity of fractures in the deeper limestone. Groundwater salinity in the region is a result of the relationship between rainfall recharge, extraction, groundwater through flow and the intrusion of a salt water lens into the aquifer. The interface between the low and high salinity groundwater is considered to be diffuse and approximately 1 to 20 meters in thickness. Anecdotal advice suggests the presence of a freshwater body overlying the saline wedge. ▪ **Depth to Groundwater** – Groundwater has been recorded beneath the site at levels of between ~0.3 and ~1 mAHD. ▪ **Groundwater Flow Direction** – Groundwater on the Cape Range is likely to flow in a radial pattern from the range heights towards both east and west coasts. Groundwater flow in the Exmouth area is generally reported to the east towards the coast with some localised variability reported in some areas. including HEH-B where groundwater flow was observed to be in the north/north-westerly direction. ▪ **Groundwater Use** –Several unregistered extraction bores are understood to be present at residential properties within the township of Exmouth, located approximately 4 km south of the site. – DWER groundwater database indicates two extraction licences (with one bore each) allocated to two properties approximately 480 m northwest of the northern HEH-B boundary. Seven registered groundwater bores were shown to be present approximately 7.2 km northwest of the northern site boundary. – A borefield, comprising 16 potable water supply bores, is located approximately two to three kilometres south west of HEH-B. Groundwater is extracted from the Cape Range aquifer and pumped via underground pipelines to a water treatment plant. ▪ **Protective Drinking Water Source Area (PDSA**) – The site is not located within a PDSA, The Exmouth Water Reserve drinking water source protection review Area, a Priority 1 area, is located approximately 870 m southwest of the site at its closest point. Priority 1 areas are usually undeveloped and under State management. ▪ **Receiving Surface Water Body** – Beneath most of the site, groundwater is generally moving in an easterly direction towards the Exmouth Gulf. Groundwater is known to be influenced by tidal variations. Previous investigations reported a low hydraulic gradient for the site.
Environmental Sensitive Areas	The site occurs within an area that is included on the Register of the National Estate because of its natural heritage value, under the Australian Heritage Council Act 2003 of the Commonwealth. ▪ The Cape Range Subterranean Waterways wetlands occurs across the site. ▪ The Cape Range National Park is located approximately 7 km to the southwest of the site at its closest point. ▪ The Bundegi Conservation Reserve is adjacent to the northeast of the site. ▪ The Ningaloo Coast, a World Heritage listed site is located within 10km of the site. The Ningaloo Coast is also listed on the National Heritage Property register.
Wetlands	The site occurs within the Cape Range subterranean Waterways wetland, listed under the Directory of Important Wetlands.
Further information can be found in the DSI report (GHD 2018) and OMP Factual and Interpretive Reports.	

4 Source Areas and Risk

The site has been subject of numerous PFAS investigation reports prior to the implementation of the PFAS OMP, including:

- Coffey 2011, *limited Groundwater Monitoring Event Report - Naval Communication Harold E Holt: Area A and Area B*,
- Aurecon 2016, *limited Groundwater Monitoring Event Report - Naval Communication Harold E Holt: Area A and Area B*.
- Golders 2016, *PFAS Environmental Management Program category 2 Property Data Gap Assessment - Harold E Holt Area B*.
- A Preliminary Site Investigation and Sampling Analytical and Quality Plan (GHD 2018 PFAS Site Investigations Naval Communication Station Harold E Holt – *Preliminary Site Investigation and Sampling Analytical and Quality Plan*);
- A Detailed Site Investigation (GHD December 2018, reference: 3135526, Naval Communication Station Harold E Holt – Area B *PFAS Investigations Detailed Site Investigation Report*).
- An Ecological Risk Assessment (ERA) (GHD 2019).

4.1 Source Areas

There are 11 Source Areas where PFAS was detected in soil or groundwater. These are considered to be the most impacted areas and include (refer to Figure 2, Appendix A):

- Area 01 – Former Fire Training Area
- Area 02 – KC Hardstand – Fire Extinguisher Training Area
- Area 03 – Former Fire Training Area (pre-1992, WA0028)
- Area 04 – Former Fire Extinguisher Training Area
- Area 05 – Building 380 (Warehouse)
- Area 06 – Operational Fire Station
- Area 07 – Former Landfills
- Area 08 – Possible former fire training and AFFF Storage Area (Pre-1992)
- Area 09 – Former Fire Fighting Facility / Water Treatment Plant
- Area 10 – Wastewater Treatment Plant (WWTP)
- Area 11 – Class IV Landfill (WA0029)

PFAS concentrations in surface soils were highest in the source areas. The concentrations of PFAS did not exceed the screening criteria for protection of human health but exceeded the ecological screening criteria in a number of investigation areas (GHD, 2018).

It is likely that the concrete/asphalt of the KC hard stand (Area 02) and the fire station driveway (Area 06) are acting as ongoing sources of PFAS to sub surface soils and groundwater via leachate.

Estimates indicated that the greatest mass of PFAS remains in the soil and groundwater in the former fire training areas (Areas 08 and 05, and Area 01).

5 Data Quality Objectives

Development of data quality objectives (DQOs) for the OMP SAQP is based on guidance presented in the ASC NEPM (NEPC 2013) and are consistent with 'Naval Communication Station Harold E Holt Area B PFAS Ongoing Monitoring Plan' (2019). The DQO process comprises the following seven steps:

- Step 1: State the problem
- Step 2: Identify the decision/principal study question(s)
- Step 3: Identify the Inputs into the Decision
- Step 4: Study Boundaries
- Step 5: Decision rules
- Step 6: Tolerable limits on decision errors
- Step 7: Optimisation of the data collection process

The DQOs are detailed in Table 5-1.

Table 5-1 Data Quality Objectives

Data Quality Step	Description
State the Problem	The DSI (GHD 2018) identified PFAS in groundwater, surface water and sediment within the Management Area at concentrations exceeding the relevant assessment levels. The DSI together with the subsequent preliminary ERA (GHD, 2019) reported that the presence of PFAS on and in the areas surrounding the Base were of low risk to receptors. Whilst the findings of the Preliminary ERA (GHD, 2019) recognised that an adverse ecological impact is unlikely, a robust dataset is required to assess trends in the nature, extent and magnitude of PFAS concentrations within sediment, surface water and groundwater. **Groundwater and seepage water** At least one groundwater sample from each of the 11 areas investigated during the DSI (GHD, 2018) reported PFOS plus PFHxS exceedances both the human health guidelines (drinking water and recreational use), with the exception of Area 02 and Area 04 which exceeded only the drinking water guideline. PFOS was detected in the majority of groundwater samples both on and east of the Base with some localised elevated PFAS concentrations in groundwater. As the regional groundwater flow is generally toward the east, it is likely that there will be some discharge of groundwater as seepage water to the Exmouth Gulf, especially after periods of rainfall. **Surface Water** PFAS was detected in surface water east (down gradient) of the Base in the backwater lagoon area at concentrations exceeding the ecological screening criterion. Surface water at HEH-B is predominantly ephemeral and the significance of PFAS exceedances of the relevant assessment criterion can be expected to be more related to its discharge to receiving surface water and impact on the aquatic ecosystems in these waters. **Sediment** The PFAS concentration in sediment samples did not exceed the assessment criteria relevant to ecological or human health risks. Sediment can however be mobilised into surface drains and can migrate off-site to Exmouth Gulf. PFAS sorbed to sediments are also prone to dissolution in surface waters. There are currently no Australian endorsed assessment levels for PFAS in sediment. Whilst the findings of the Preliminary ERA (GHD, 2019) recognised that an adverse ecological impact is unlikely, a robust dataset is required to assess trends in the nature, extent and magnitude of PFAS concentrations within sediment, surface water and groundwater to validate/improve the understanding of the CSM in relation to spatial and temporal variability of PFAS concentrations within the Management Area and associated receptors.

Data Quality Step	Description
Identify the decision/principal study question(s)	This OMP is to provide further data to assess the following principal study questions: ▪ What are the changes and trends in the nature, extent and magnitude of PFAS concentrations in the groundwater, surface water and sediment within the Management Area? ▪ Has the nature, extent and magnitude of PFAS concentrations changed significantly to warrant a revision of the level of risk? ▪ Has the nature, extent and magnitude of PFAS concentrations changed significantly to warrant refinement of any existing management measures?
Identify the Inputs into the Decision	The following inputs are required to resolve the principal study questions outlined in Step 2: ▪ PFAS concentrations in groundwater, surface water and sediment from previous and future monitoring events. ▪ Field data (i.e. groundwater levels, physico-chemical parameters) on groundwater, surface water and sediment from previous and future monitoring events. ▪ An appropriate statistical evaluation of the data (e.g. using Mann-Kendall or similar analysis) including short- and long-term trends, in particular for surface water and groundwater concentrations. ▪ Comparison of data sets to relevant endorsed assessment levels (refer to Section 7).
Study Boundaries	Ongoing monitoring will generally be undertaken within the boundaries of the Management Area (Figure 2, Appendix A) at the groundwater, surface water, seepage and sediment monitoring locations outlined in Sections 6.3.1 and 6.4.1. Monitoring will be undertaken every sixth months, with one monitoring event post-summer (June) and one post-winter (November). An additional surface water and sediment monitoring event will take place following the first flush immediately (or as close as possible) following the first heavy rainfall event of the wet season. Section 6 provides further detail on the monitoring frequency.
Develop a Decision Rule	▪ The analytical and field data will be used to assess changes to the nature, extent and magnitude of PFAS in surface water, sediment and groundwater and to provide supporting data for assessment of management actions, where relevant. ▪ Trends in PFAS concentrations, including an assessment of temporal and spatial changes, will be assessed using an appropriate statistical analysis approach (e.g. using Mann- Kendall, GWSdat or similar analysis), with a specified level of confidence based upon the number of monitoring rounds completed. ▪ The analytical data will be compared to the relevant assessment levels (presented in Section 0) and/or historic concentrations (i.e. maximum concentration) recorded during prior monitoring rounds [i.e. during the DSI (GHD 2018)] to evaluate changes in the risk profile and whether revision of the OMP, ERA or implemented management measures is warranted. Where exceedances of adopted assessment criteria levels (presented in Section 0) or new detections are reported, further interrogation of data will be undertaken to the extent relevant to assess the risk profile and location. A summary of the key decision rules as detailed below: 1. Have the analytical data collected as part of the monitoring program met the DQI (refer Table 5-2.below)? If yes, then the data can be used to answer the decision rule below and the decision statements developed in Step 2. If no, then an assessment of the need to collect additional data will be required. 2. Do PFAS concentrations exceed the investigation criteria? If no, then the contamination would be considered not to pose an unacceptable risk. Where results exceed the adopted investigation criteria, this may not necessarily indicate an unacceptable level of risk. Further risk assessment, and potentially additional investigations, will be required to determine the potential for unacceptable impacts. 3. Has PFAS been detected in any of the off-site bores previously not detected? If yes, do PFAS concentrations reported indicate an increasing trend and/or exceed historic maximum concentrations? Do results indicate a potential risk to associated receptors (e.g. local ecosystems) including associated risks that PFAS may present towards human receptors. Further risk assessment, and potentially additional investigations, will be required to determine the potential for unacceptable impacts.

Data Quality Step	Description
	4. Has PFAS been detected in onsite drainage channels and offsite seepage water within the management areas? If yes, do PFAS concentrations reported indicate an increasing trend or exceed historic maximum concentrations? Do results indicate a potential risk to receptors and changes to the risk profile? Further risk assessment, and potentially additional investigations, will be required to determine the potential for unacceptable impacts. The Annual Interpretive Report will review the results obtained against these triggers/decisions and the management response triggers and contingencies listed in the OMP (Section 4.3).
Specify Limits on Decision Error	The potential for significant decision errors will be minimised by completing a robust QA/QC program in accordance with DER and NEPM guideline requirements. Standard operating procedures will be closely followed in the field to ensure accurate and representative data acquisition. DQIs will be applied to assess usability of data prior to making decisions, based on precision, accuracy, representativeness, comparability and completeness. The acceptable limit on decision error is 95% compliance with the applied DQIs (see Table 5-2). If any of the DQIs are not met, further assessment will be necessary to evaluate the significance of the non- conformance and any corrective actions. The Annual Interpretive Report will review the results obtained against these triggers/decisions.
Optimise the Design for Obtaining the Data	The design of the OMP has been made in consideration of historical activities at the site, historical investigations (and findings i.e. PSI, DSI and ERA), in the context of developing responses to the principal study questions outlined in Step 2 and to meet the DQOs ensuring that a representation of the current site condition can be achieved. The OMP scope is outlined in Section 6. The available data will be reviewed and evaluated to determine if the frequency of monitoring should increase or decrease to provide better understanding of PFAS concentration fluctuations and potential risks to receptors. As additional information is gathered during the course of this investigation/monitoring, it may be beneficial for the proposed scope of works to be altered from the initial design. Changes to the proposed monitoring, if considered necessary, will be made based on risk profile reviews and updated CSM and in consultation with the Client Other factors that will optimise the design for obtaining data will include the use of laboratories that are NATA accredited for PFAS analysis and ensure laboratory LORs are suitable to meet the relevant adopted assessment levels (where possible), experienced field scientist(s), robust field and laboratory quality assurance/quality control protocols are adopted and Field and analytical data are collected in accordance with the PFAS NEMP (HEPA 2020), ASC NEPM (NEPC 2013) and the assessment of contaminated sites (DWER 2021).

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

Table 5-2 Data Quality Indicators

Data Quality Indicator	Detail
QA Documentation	Provision of appropriate work plans, DQI and DQO defined for the site and all QA/QC aspects documented.
Bias	A measure of the potential distortion in an analysis which can result in errors in one direction (e.g. one laboratory consistently higher results or consistent poor spiked matrix recovery). Bias will be assessed with reference to the analysis of spiked matrix samples (NEPC 1999b).
Representativeness	A qualitative measure of the confidence that data is representative of each medium present on the site. Use of appropriate and documented sampling methods, sampling handling, preservation and transport and holding times.
Precision:	A quantitative measure of data variability or reproducibility, measured by the calculation of %RPD values for duplicate samples (i.e. measure of agreement). Precision in DQI is considered an important assessment in an environmental study (USEPA, 2002, Guidance on Environmental Data Verification and Data Validation). It can be measured as follows: ▪ Percentage of the mean of the measurement such as Relative Percent Difference (i.e. %RPD). The %RPD will be calculated for the field and secondary duplicate (i.e. inter and intra-laboratory analysis); and ▪ Use of similar analytical method and instrument (e.g. for inter-laboratory assessment). The %RPD will be considered as acceptable if the values are: **Magnitude of result** / **Acceptable RPD range** <10 x limited of reporting (LOR) / No limits 10 – 20 x LOR / 0% - 50% >20 x LOR / 0% - 20% ▪ Should there be a result that is greater than acceptable RPD range, then a “review should be conducted of the cause (e.g. instrument calibration, appropriateness of method used)” (NEPC, 2013). For the purpose of this OMP, field and secondary duplicates should be collected at a rate of 1 in 10 samples (HEPA 2020 and GHD, 2018).
Accuracy	A quantitative measure of the closeness of data to a ‘true value’, measured by the analysis of spike, blank and laboratory control samples (LCS). The LCS consists of a standard reference material or a matrix of known concentration. For the purpose of assessing accuracy it is required that at least one LCS for each process batch [2] be analysed (NEPC, 2013).
Comparability	A qualitative measure of the confidence that data may be considered to be equivalent for each sampling and analytical event. By use of standard procedures, comparable methods, qualified personnel, and review of sample integrity.
Completeness	A measure of the amount of usable data (expressed as a percentage - %) from a data collection activity, based on completeness of test program, overall QA/QC completeness and validity of data set.

[2] The NEPM Schedule B3 – *Guideline on Laboratory Analysis of Potentially Contaminated Soil* defines a laboratory process batch to consist of up to “*20 samples that are similar in term of matrix and test procedure, and are processed as one unit for the QC purposes*” (NEPC, 2013).

6 Ongoing Monitoring Program

6.1 OMP SAQP History

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

Table 6-1 OMP SAQP History

SAQP Version	Date	Report Section	Changes	Justification
Rev 2	22/11/2019	all	Minor edits	Defence comments
Rev 3	18/06/2020	7	Update of assessment criteria and reference to HEPA (2020). Well ID update as per DCARM update	New guideline (HEPA, 2020) DCARM update
Rev 4	17/05/2021	6.3	Table 'Wells construction details' added.	Defence review
		6	Methodology tables updates	
Rev 5	14/06/2021	-	Correct typos and minor updates throughout	Defence Review
Rev 6	01/11/2022	-	Methodologies & guidelines updates	Defence Review, revised guideline documents
Rev 7	27/02/2023	6, 7	Replacement of MW109 (inaccessible) by MW108. Minor methodology and formatting updates Removed reference to soil guidelines for sediment assessment.	Defence Review
Rev 8	01/06/2023	-	Formatting and minor updates	Defence review and SAQP update

6.2 Management Area Description

The OMP includes sampling and analysis not only from the site, but also from a number of surrounding (off-site) waterways, groundwater bores and seepage locations. The site and these surrounding areas are collectively referred to as the "Management Area". The Management Area boundaries are presented on Figure 2, Appendix A.

The 'Management Area' includes:

- The source areas (as described in Section 4.1)
- Land to the east and north-east of the site (down-gradient) to the coastline and including the backwater lagoon area.
- The drainage channel south-east of the site.

The Management Area excludes the Base supply borefield located to the south-west of the site (up hydraulic gradient) as previous investigation did not report PFAS detect from any of the samples collected from potable supply bores and post treatment samples (GHD 2018 & 2019).

6.3 Groundwater Monitoring

6.3.1 Groundwater Monitoring Network

The groundwater monitoring network, sampled as part of the DSI (GHD 2018), includes 94 single level monitoring wells and 10 multilevel wells. The network of on- and off-site groundwater monitoring locations is summarised in Table 6-2 and Table 6-3.

Table 6-2 HEH-B Groundwater Monitoring Network (single-level)

Area	Average screen interval (mBGL)	Monitoring Well / Bore ID
Source South	2.5 – 12.5	MW315, MW316, MW317, MW318, MW302, MW303, MW304, MW305, MW306, MW307, MW308, MW309, MW310, MW311, MW313, MW314, MW101, MW102, MW103D, MW103S, MW112, MW113, MW114D, MW114S, MW115, MW116, MW117, MW119, MW120D, MW120S, MW122, MW123, MW124, MW125D, MW125S, MW126, MW127, MW138, MW139, MW141, MW142, MW143, MW144D, MW144S, MW150
Source North	3.0 – 10.0	MW319, MW328, MW330, MW321, MW322, MW327, MW325, MW323, MW320, MW326, MW331, MW332, MW333, MW334, MW335, MW336, MW104, MW105D, MW105S, MW106D, MW106_S, MW107, MW108, MW109, MW110, MW111 MW140, MW145, MW146, MW147, MW148S
Pathway 1	1.0 14.5	MW151D, MW151S, MW152D, MW152S, MW153D, MW153S, MW154D, MW154S, MW155D, MW155S, MW156D, MW156S
Pathway 2	3.5 – 11.5	MW118D, MW118S, MW121,

Table 6-3 HEHB Groundwater Monitoring Network (multi-level)

Well ID	Screen interval (mBGL)	Time Sampled	DSI (2018) Concentration Range		
			Sum of PFHxS + PFOS (µg/L)	PFOS (µg/L)	PFOA (µg/L)
MW128	1.7 – 2.2	0	-	-	-
	3.7 – 4.2	2	ND	<0.0002 – **0.001**	ND
	5.7 – 6.2	2	ND – 0.002	<0.0002 – **0.002**	ND
	7.7 – 8.2	2	ND	<0.0002	0.001
MW129	1.5 – 2.0	0	-	-	-
	3.5 – 4.0	2	ND	<0.0002	ND
	5.5 – 6.0	2	ND	<0.0002	ND
	7.5 – 8.0	2	ND	<0.0002	ND
MW130	2.9 – 3.4	2	0.005 – 0.013	**0.004** – **0.011**	ND
	4.9 – 5.4	2	0.052 – 0.232	**0.048** – **0.16**	ND – 0.002
	6.9 – 7.4	2	0.005 – 0.007	**0.003** – **0.004**	ND
MW131	2.0 – 2.5	2	ND – 0.004	<0.0002 – **0.004**	ND
	4.0 – 4.5	2	ND	<0.0002	ND
	6.0 – 6.5	2	0.001 – 0.002	**0.001** – **0.002**	ND
	8.0 – 8.5	2	ND	<0.0002	ND
MW132	4.4 – 4.9	0	-	-	-
	6.4 – 6.9	2	0.015 – 0.034	<0.0002 – **0.002**	0.008 – 0.025
	8.5 – 9.0	2	ND - 0.004	<0.0002 – **0.004**	0.002 – 0.014
MW133	1.0 – 1.5	0	-	-	-
	3.0 – 3.5	2	0.03 – 0.038	**0.020** – **0.029**	0.002 – 0.004

Well ID	Screen interval (mBGL)	Time Sampled	DSI (2018) Concentration Range		
			Sum of PFHxS + PFOS (µg/L)	PFOS (µg/L)	PFOA (µg/L)
	5.0 – 5.5	2	0.034 – 0.042	**0.020** – **0.030**	0.004
	7.0 – 7.5	2	0.022 – 0.031	**0.008** – **0.020**	ND – 0.001
MW134	4.6 – 5.1	0	-	-	-
	6.6 – 7.1	2	ND	<0.0002	ND
	8.6 – 9.1	2	0.002 – 0.003	**0.002** – **0.003**	ND – 0.001
MW135	8.3 – 8.8	2	ND – 0.008	<0.0002 – **0.007**	ND
	10.3 – 10.8	2	0.007 – 0.016	**0.005** – **0.012**	ND – 0.001
MW136	4.5 – 5.0	0	-	-	-
	6.5 – 7.0	2	ND – 0.006	<0.0002 – **0.006**	ND
	8.5 – 9.0	2	0.008 – 0.01	**0.006** – **0.007**	ND – 0.001
	10.5 – 11.0	2	0.006 – 0.012	**0.004** – **0.009**	ND – 0.001
MW137	4.1 – 4.6	0	-	-	-
	6.1 – 6.6	2	ND - 0.001	<0.0002 – **0.001**	ND
	8.1 – 8.6	2	0.008 – 0.015	**0.007** – **0.015**	ND
	10.1 – 10.6	2	0.006 – 0.017	**0.005** – **0.013**	ND – 0.001

Notes:

1. ND = Non-Detections (<LOR)
2. - = not sampled
3. **Bold** = exceeds adopted assessment criteria (99% species protection level for fresh and marine water).

It is proposed to monitor a representative sub-set of the monitoring wells as part of the OMP. The groundwater wells and bores selected for monitoring are presented in Table 6-4, along with the rationale for the selection, and are shown on Figure 3, Appendix A. For the multilevel monitoring wells, only the shallowest (non-dry) screened intervals will be sampled. Seepage water sample locations were chosen to assess the inferred groundwater discharge zone along the coast and are shown on Figure 3, Appendix A.

Table 6-4 OMP Groundwater and Seepage Water Monitoring Locations

Area	Monitoring Well / Bore ID	Rationale (OMP, 2019)
On-site – Source South	MW103D, MW113, MW115, MW142, MW143, MW310, MW311, MW315	Monitoring of these wells will provide a confirmation of overall PFAS impact identified in the DSI (GHD, 2018).
Off-site – Source South	MW122, MW126, MW135, MW144S	Assessment of overall changes in PFAS concentration in the source areas to provide temporal data on depletion of the source zone.
On-site – Source North	MW105S, MW108, MW145, MW326	Monitoring of these wells will provide a confirmation of overall PFAS impact identified in the DSI (GHD, 2018).
Off-site – Source North	MW134, MW147, MW148S	Assessment of overall changes in PFAS concentration in the source areas to provide temporal data on depletion of the source zone.
Off-site - Pathway 1	MW137, MW151S, MW152S, MW153S, MW154S, MW155S	Monitoring of these wells will provide a confirmation of overall PFAS impact identified in the DSI (GHD, 2018).
Off-site - Pathway 2	MW022, MW118D, MW133	Assessment of changes in PFAS concentration and distribution in the main migration pathways. This will also allow for early detection of significant changes in migration so contingencies can be put in place.
Off-site - Receptor A	MW128, MW129, MW130, MW131, MW132	Monitoring of these wells will provide a confirmation of overall PFAS impact identified in the DSI (GHD, 2018). Assessment of changes in PFAS concentration and distribution in the main aquatic receptors.
Off-site - Receptor C	**Seepage water:** OTH101, OTH102, OTH103, OTH104, OTH105, OTH106	Assessment of changes in PFAS concentration and distribution in the main aquatic receptors.

Notes:

1. *Source: Defence, PFAS Investigation and Management Branch, May 2019, reference: Naval Communication Station Harold E Holt Area B PFAS Ongoing Monitoring Plan*

Construction details for the groundwater wells monitored as part of the OMP are provided in Table 6-5.

Table 6-5 OMP Groundwater Monitoring Wells Construction Details

Well ID	Date drilled	Easting[1]	Northing[1]	RL TOC (mAHD)	Depth (mbgl)	Screen interval (mbgl)
MW022	2005	203690.76	7576790.86	6.675	7	4.0 – 7.0
MW103D	2018	203329.431	7576537.142	9.3778	15	11.0 – 15.0
MW105S	2018	203735.824	7577382.464	3.8438	4	2.0 – 4.0
MW108	2018	203458.683	7577485.194	4.4433	6.7	1.7 – 6.7
MW113	2018	203468.605	7576960.375	6.6842	9.5	4.5 – 9.5
MW115	2018	203334.105	7576817.814	7.7258	10.3	5.3 – 10.3
MW118D	2018	203698.84	7576749.01	6.2622	11.5	7.5 – 11.5
MW122	2018	203779.883	7576980.204	5.0782	8.5	3.8 – 8.5
MW126	2018	203878.437	7577131.909	4.8325	8.5	4.5 – 8.5
MW128	2018	205064.572	7578814.858	2.5408	2.2	1.7 – 2.2
				2.5435	4.2	3.7 – 4.2
				2.5435	6.2	5.7 – 6.2
				2.5402	8.2	7.7 – 8.2
MW129	2018	205037.92	7578323.165	2.5409	2	1.5 – 2.0
				2.5311	4	3.5 – 4.0
				2.5360	6	5.5 – 6.0
				2.5329	8	7.5 – 8.0
MW130	2018	205021.909	7577893.294	2.3879	3.4	2.9 – 3.4
				2.4364	5.4	4.9 – 5.4
				2.4665	7.4	6.9 – 7.4
MW131	2018	204969.244	7577404.156	2.8798	2.5	2.0 – 2.5
				2.8774	4.5	4.0 – 4.5
				2.8901	6.5	6.0 – 6.5
				2.8750	8.5	8.0 – 8.5
MW132	2018	204993.966	7576588.225	5.4103	4.9	4.4 – 4.9
				5.4349	6.9	6.4 – 6.9
				5.4383	9.0	8.5 – 9.0
MW133	2018	204781.097	7576151.267	2.1554	1.5	1.0 – 1.5
				2.1505	3.5	3.0 – 3.5
				2.1642	5.5	5.0 – 5.5
				2.1639	7.5	7.0 – 7.5
MW134	2018	203032.294	7577623.013	6.5431	5.1	4.6 – 5.1
				6.5343	7.1	6.6 – 7.1
				6.5308	9.1	8.6 – 9.1
MW135	2018	202874.901	7576434.208	9.3010	10.8	10.3 – 10.8
				9.2988	8.8	8.3 – 8.8
MW137	2018	204272.302	7575960.642	5.3829	10.6	10.1 – 10.6

Well ID	Date drilled	Easting[1]	Northing[1]	RL TOC (mAHD)	Depth (mbgl)	Screen interval (mbgl)
				5.3964	4.6	4.1 – 4.6
				5.3984	6.6	6.1 – 6.6
				5.3907	8.6	8.1 – 8.6
MW142	2018	203597.027	7576765.258	7.5281	10.5	4.5 – 10.5
MW143	2018	203213.083	7576948.347	10.5204	13	7.0 – 13.0
MW144S	2018	203789.728	7577130.423	6.0715	8	2.0 – 8.0
MW145	2018	204055.272	7578427.366	3.8644	6.9	0.9 – 6.9
MW147	2018	203236.792	7578450.511	5.51	8.5	4.5 – 8.5
MW148S	2018	203120.357	7577933.916	5.7648	9	3.0 – 9.0
MW151S	2018	204583.686	7578205.221	3.4	5	1.0 – 5.0
MW152S*		204389.713	7577750.926	3.4103	6.5	2.5 – 6.5
MW153S	2018	204340.792	7577288.126	4.7872	6	2.0 – 6.0
MW154S	2018	204271.556	7576695.5	3.8177	6	2.0 – 6.0
MW155S	2018	204179.752	7576243.764	5.0072	8.5	2.5 – 8.5
MW310	2011	203619.44	7576985.36	5.401	6.5	3.5 – 6.5
MW311	2011	203631.98	7577127.96	4.205	5.5	2.5 – 5.5
MW315	1995	202923.01	7576867.54	8.018	9.5	6.5 – 9.5
MW326*		203662.07	7577961.15	2.611		

Note: * No bore log available

6.3.2 Monitoring Frequency

All groundwater monitoring locations listed in Table 6-4 will be sampled every six months for the three years initial implementation period. Sampling will be undertaken post-summer (June) and post-winter (November) to record the concentration and extent of PFAS and determine any seasonal fluctuations or trends.

6.3.3 Groundwater and Seepage Sampling Methodology

Groundwater sampling methodology are detailed in the following sections.

6.3.3.1 Groundwater Monitoring Wells and Seepage Water

Groundwater monitoring will be undertaken by no purge HydraSleeve® method for the single-level wells, while the multilevel wells will be sampled with a peristaltic pump and seepage water sampling will be conducted through methodology consistent with the 2018 DSI, as detailed in Table 6-6.

Table 6-6 Groundwater Monitoring Wells – Sampling Method

Activity	Details
Well Gauging	Standing Water Level (SWL) will be gauged using an interface probe. All wells will be measured against a specified mark at the top of the well casing. Wells along the coastline will be gauged during the same tidal period.
Groundwater Field Parameters	For the single level wells, the field parameters will be recorded via a water quality meter from the HydraSleeves® or hand bailed water. For the multilevel wells, the field parameters will be recorded with a flow through cell during purging. The following field parameters will be recorded: ▪ pH. ▪ electrical conductivity (EC).

Activity	Details
	▪ oxidation reduction potential (ORP). ▪ Dissolved oxygen (DO). ▪ Temperature. Once field parameters have stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) stabilised parameters' measurement will be recorded on field data records. All field instruments (e.g. water quality meter) will be calibrated by the equipment supplier and daily readings of reference solutions (bump tests) completed to optimise the accuracy of the measurements taken.
Deployment and Retrieval of HydraSleeves® (single level well sample collection)	HydraSleeves® will be deployed with top weight sample collection to begin at the lowest point. HydraSleeves® sampling devices will be left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. Samples will be collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples will be discharged immediately (minimise changes in chemistry) via discharge tube. Following sampling, HydraSleeves® will be deployed in preparation for the next OMP monitoring event using the same string for consistency (same depth of sampling i.e. within screen depth).
Peristaltic pump (multi-level well sample collection)	The shallowest (non-dry) well will be sampled at each location using Teflon-free dedicated and disposable high-density polyethylene (HDPE) tubing coupled to a peristaltic pump system. The groundwater will be purged at a low flow rate of 0.2 L/min. SWL and field parameters will be monitored during purging and post sample collection to ensure limited drawdown effects. The groundwater will be sampled when the field parameters have stabilised.
Alternative sampling methodology (hand bailing)	Disposable HDPE hand bailers, attached to a polypropylene string, will be used in the event that the water column isn't sufficient to fill the HydraSleeve®. Purging of the well (i.e. removal of 3x well volume) will be undertaken prior to sampling to ensure that a sample representative of the aquifer is taken. Field parameters will be regularly recorded during the bailer purge to confirm field parameter stability is achieved.
Seepage Water Sampling	Sampling will be carried out within a two-hour period; one hour each side of the low tide. Sampling protocol will involve a shallow excavation in the beach sand; just above where inundation by wave action is occurring. In-situ water parameters will be measured from water seeping into the excavation using a calibrated water quality meter following purging (using a dedicated syringe or jug). Sampling containers will be lowered into the exposed seepage water and filled.
Field Records	Field records will include the following information: ▪ Sampling time, date and name of the sampler. ▪ Weather conditions. ▪ Sample Collection method. ▪ Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised. ▪ Calibration and daily bump tests records. All sample documentation including field notebooks, reporting records, COC and equipment calibration certificates and procedures will be retained within project files.
Decontamination procedure	Dedicated HydraSleeves® and single use nitrile gloves will be used at each groundwater bore thus removing the need for decontamination. All re-usable sampling equipment will be thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample bottle will be pre-labelled by the laboratory with a unique barcode and then scanned into a mobile application to generate the CoC.

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

Notes:

1. Cardno notes that the seepage water sampling method detailed in the SAQP is not consistent with the OMP as per Defence directions (via email RE: Justification of time and costs for seepage and multi-level well sampling [SEC=UNCLASSIFIED] dated 11 November 2019).

6.4 Surface Water and Sediment Monitoring

6.4.1 Monitoring Locations

Several surface water and sediment locations were sampled as part of the DSI (GHD 2018) on and off-site including:

> The on-site drainage channels (11).

> The off-site drainage channel to the Exmouth Gulf (18).

> The Backwater Lagoon (3).

It is proposed to monitor a representative sub-set of the surface water and sediment locations as part of the OMP. The locations selected for monitoring are presented in Table 6-7 along with the rationale for the selection, and are highlighted on Figure 3, Appendix A.

Table 6-7 OMP Surface Water and Sediment Monitoring Locations

Area	Surface water Sampling Location ID	Sediment Sampling Location ID	Rationale (GHD, 2019b)
Off-site - Pathway 2	SW164, SW181, SW165, SW167, SW169, SW171, SW173, SW179	SS164, SD181, SS165, SS167, SS169, SS171, SS173, SS179	Confirmation of the presence of PFAS in the main drainage channel from the Base which discharges in to Exmouth Gulf. Monitoring of these locations will provide an indication of any change in the nature or magnitude of PFAS in surface waters and sediments, and will help in determining changes attributable to seasonal fluctuations. First flush monitoring to assess the potential increase in PFAS surface water and sediment concentrations following first flush rainfall and subsequent timeframe for attenuation to 'long-term average' concentrations
Off-site - Receptor B	SW161, SW162, SW163	SS161, SS162, SD163	Confirmation of the presence of PFAS in the Backwater Lagoon.

Source: Defence, PFAS Investigation and Management Branch, May 2019, reference: Naval Communication Station Harold E Holt Area B PFAS Ongoing Monitoring Plan

6.4.2 Surface Water and Sediment Monitoring Frequency

The surface water and sediment monitoring locations listed in Section 6.4.1 will be sampled three times per year, as follows:

- Post-summer (June) and post-winter (November) to record the concentration and extent of PFAS and determine any seasonal fluctuations or trends. This monitoring frequency aligns with the climate of the Management Area, which features the highest volume of rainfall typically between January and July and lower rainfall between September and December. This sampling should be conducted in conjunction with the groundwater/seepage monitoring described in Section 6.3
- An additional monitoring event will be conducted immediately (or as close as possible) following the first heavy rainfall event of the wet season in January or February, involving sampling of surface water and sediment locations described in Table 6-7. This would serve to assess the potential increase in PFAS surface water concentrations following 'first flush' rainfall and subsequent timeframe for attenuation to 'long-term average' concentrations.

6.4.3 Surface Water Sampling Methodology

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

Table 6-8 Surface Water Monitoring

Item	Details
Field parameters	Surface water physiochemical parameters (i.e. pH, electrical conductivity (EC), oxidation reduction potential (ORP), dissolved oxygen (DO), and temperature) will be recorded at the time of sampling using a pre-calibrated water quality meter. Field observations such as odours or sheen presence must also be recorded on field sampling sheets.

Item	Details
Sampling Method	Surface water samples will be collected directly into sample containers using a 'Grab' (manual) sample method via a long-handled sampling device. Where depth permits, the sample container should be positioned at least 10 cm below the surface water level and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films. Samples will be decanted into the laboratory supplied sample containers. Samples will be collected in accordance with Australian/New Zealand Standards (AS/NZS 5667.1:1998) '*Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*'.
Sample Collection	Water samples will be placed directly into appropriately labelled, laboratory supplied sample bottles and packed in chilled containers for delivery to the laboratory under Chain of Custody documentation.
Decontamination	All re-usable sampling equipment will be thoroughly washed using PFAS-free detergent, then double rinsed with clean water before the sample collection. Single-use nitrile gloves will be worn during sampling.
Sample identification, preservation, transport and holding times.	Each sample will be labelled with the sample location, date, project identification number and sampler's initials. Samples will be contained in appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times will be undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate). ▪ All holding times will comply with the requirements set out in Australian Standard AS/NZS 5567.1:1998.
Field Records	Field records will include the following information: ▪ Sampling time, date and name of the sampler. ▪ Weather conditions. ▪ Sample Collection method. ▪ Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised. ▪ Calibration and daily bump tests records. All sample documentation including field notebooks, reporting records, COC and equipment calibration certificates and procedures will be retained within project files.
Laboratory Testing	Surface water samples will be analysed for the following: ▪ Full PFAS analytical suite (see Appendix B). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride sulfate, alkalinity and ionic balance)
Laboratory Testing – Quality Control	Surface water QC samples will be collected at the following frequencies as detailed in the SAQP: ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples should be sent to a secondary laboratory. ▪ Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)].
Laboratory Accreditation and Limits of Reporting	All surface water analysis will be undertaken by laboratories accredited by the NATA. ▪ Primary analysis will be undertaken by ALS Global Laboratories (Perth) ▪ Secondary analysis will be undertaken by Eurofins ARL (Perth). Laboratory LORs will be suitable to meet the relevant adopted assessment levels (0.01 µg/L).

6.4.4 Sediment Sampling Methodologies

The methodology for sediment sampling is detailed in Table 6-9.

Table 6-9 Sediment Investigation Methodology

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

7 Assessment Criteria

7.1 Groundwater and Surface Water

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

Table 7-1 Criteria for Groundwater and Surface Water

Location	Adopted Assessment Criteria	
Groundwater	**Human Health**	**Ecological**
On-site and Off-site	**Recreational Use:** ▪ PFOS + PFHxS – 2.0 µg/L ▪ PFOA – 10 µg/L	**99% species protection level for fresh and marine water:** ▪ PFOS – Laboratory LOR* ▪ PFOA – 19 µg/L
Surface Water	**Human Health**	**Ecological**
Off-site	**Non potable use of groundwater (NPUG) and Recreational Use:** ▪ PFOS + PFHxS – 2.0 µg/L ▪ PFOA – 10 µg/L.	**99% species protection level for fresh and marine water:** ▪ PFOS – Laboratory LOR* ▪ PFOA – 19 µg/L

*The criterion of 0.00023 µg/L is lower than the laboratory level of reporting (LOR) and is somewhat impractical. However, the PFAS NEMP 2020 allows for the adoption of the laboratory LOR as a screening level rather than a quantified measurement.

7.2 Sediment

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

8 Reporting

8.1 Factual Reporting

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

- Introduction
- Scope of work completed.
- Description of sampling methodologies used.
- Field observations (e.g. condition of monitoring wells, description of purged water) and water quality parameter measurements.
- Summary of any changes to the monitoring network condition that may affect data integrity, or require rectification works, and recommendations for repair, replacement of decommissioning of a location
- Evaluation of the applicability of adopted assessment levels.
- Review of the suitability of the data for assessment purposes (QA/QC evaluation).
- Summary tables presenting gauged groundwater and surface water levels.
- Presentation of inferred groundwater contours and inferred groundwater flow direction in a figure.
- Summary tables of analytical results in comparison to adopted assessment levels.
- Graphs showing historical concentrations of PFOS, PFOA and PFOS plus PFHxS.
- Laboratory reports, Chain of Custody (CoC) documentation, field sampling records, data validation and QA/QC details, equipment calibration certificates and other relevant documentation.

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

8.2 Interpretive Reporting

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

- The factual information described in Section 8.1.
- Evidence of compliance with the requirements of the SAQP and meeting stated objectives of the OMP.
- Relevant figures depicting sampling locations and site-specific hydrogeological features.
- Laboratory results and analysis including comparison with relevant screening criteria as identified in each OMP.
- Assessment and commentary on appropriate Quality Assurance/ Quality Control (QA/QC) procedures.
- Assessment against the management response triggers and contingencies detailed in the OMP.
- A discussion of analytical results in relation to the following:
  - Trends in PFAS concentrations, including an assessment of temporal changes and/or changes to the extent of PFAS impacts. Trends should be assessed using an appropriate statistical analysis approach (e.g. using Mann-Kendall or similar analysis), with a specified level of confidence based upon the number of monitoring rounds completed.
  - Consideration, based on data trends, as to whether any of the existing remediation / management measures should be re-assessed, with a view to potential modification, supplementation or cessation.
  - Assessment of whether changes to the CSM and/or risk assessment are required.
  - Whether recalibration or changes to the groundwater model are required to provide a better understanding of the potential future extent of PFAS impact in groundwater.

> Based on the data obtained, an assessment of the OMP sampling requirements with a view to establishing whether:
  - The number of locations monitored could be reduced, such as where PFAS concentrations are stable and are considered to present a low risk to receptors.
  - Additional monitoring locations are required, including the installation of new monitoring wells or sampling of additional existing wells (and/or private bores) to provide better understanding of the nature, extent or magnitude of PFAS impacts in a particular portion of the Management Area.
  - The frequency of monitoring should increase or decrease to provide better understanding of PFAS concentration fluctuations and potential risks to receptors.
  - Monitoring of additional media should be included in the OMP. *For example, if monitoring of surface water demonstrates a trend of increasing PFAS concentrations, or if concentrations significantly greater than those recorded in previous investigations are recorded, then the requirement to conduct monitoring of aquatic biota should be considered (DoD, 2019).*

> An overview of remedial works or construction and maintenance activities undertaken in the management area during the reporting period, which may impact the CSM

> A statement as to whether the risk profile has changed overall, or for any specific location at the site, and a recommendation as to whether this should trigger an OMP and/or PMAP review, or other action.

9 References

General References

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2. Australian Standard AS 4482-1999 *Guide to the investigation and sampling of sites with potentially contaminated soils*, Part 2 – Volatile substances.
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30. Cardno, now Stantec, September 2022, *PFAS OMP First Flush Sampling Event Factual Report, May 2022, HEH-B*.

31. Cardno, now Stantec, October 2022, *PFAS OMP Biannual Monitoring Factual Report, June 2022, HEH-B*.
32. Cardno now Stantec, February 2023, *PFAS OMP Biannual Monitoring Factual Report, November 2023, HEH-B*.
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APPENDIX

A

Figures



FIGURE 1

1:100,000Scale at A3

Metres

0 1,500 3,000

Site Location

SAMPLING AND ANALYSIS QUALITY PLAN
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-02-27 | Project: DEF19009
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-001_RegionalLocation 02.mxd
Aerial Imagery Supplied by Google Earth

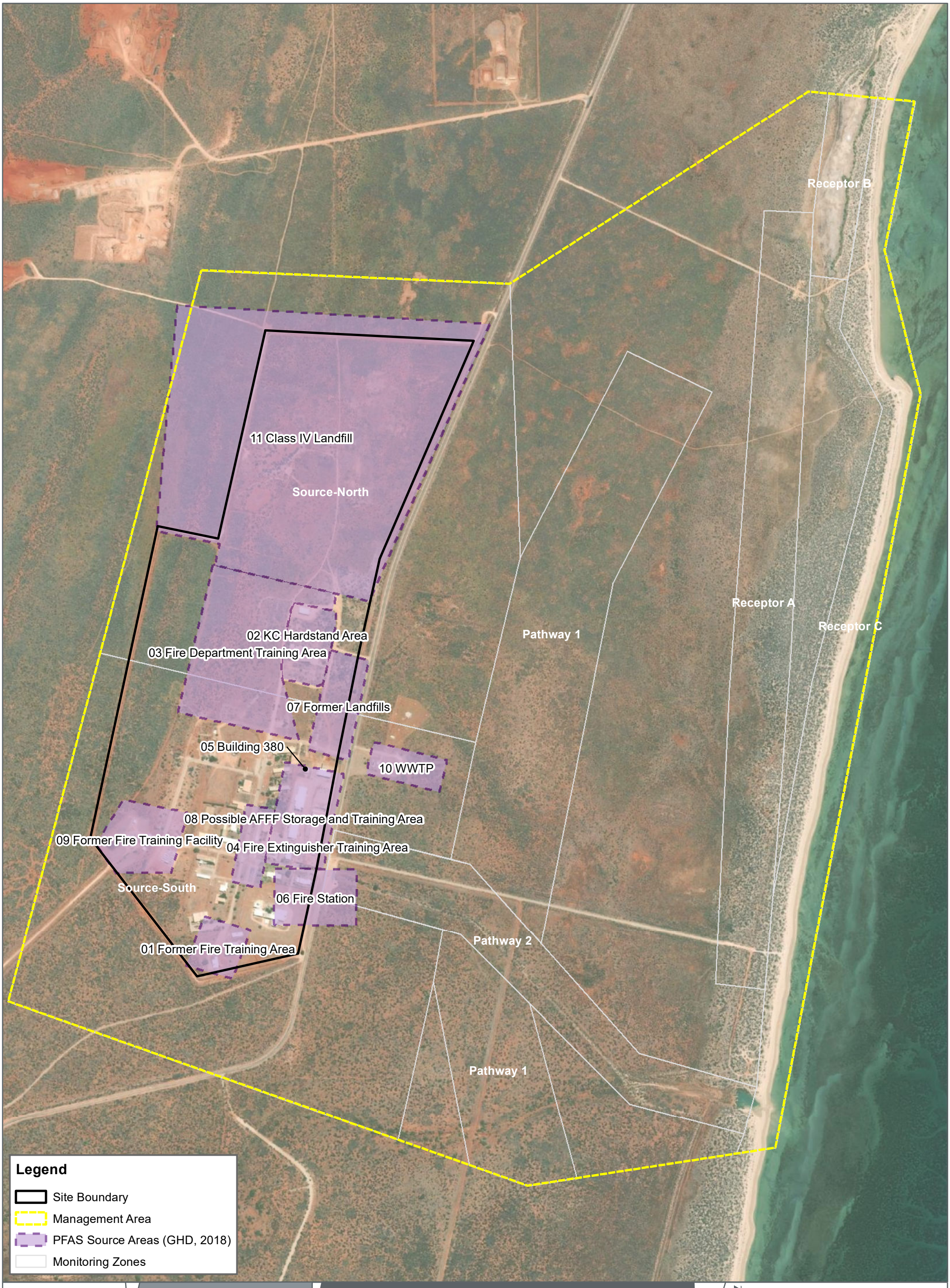


FIGURE 2

1:11,500 Scale at A3

Metres

0 250 500

Management Area

SAMPLING AND ANALYSIS QUALITY PLAN
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-02-27 | Project: DEF19009
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-002_ManagementAreas 02.mxd
Aerial Imagery Supplied by Google Earth

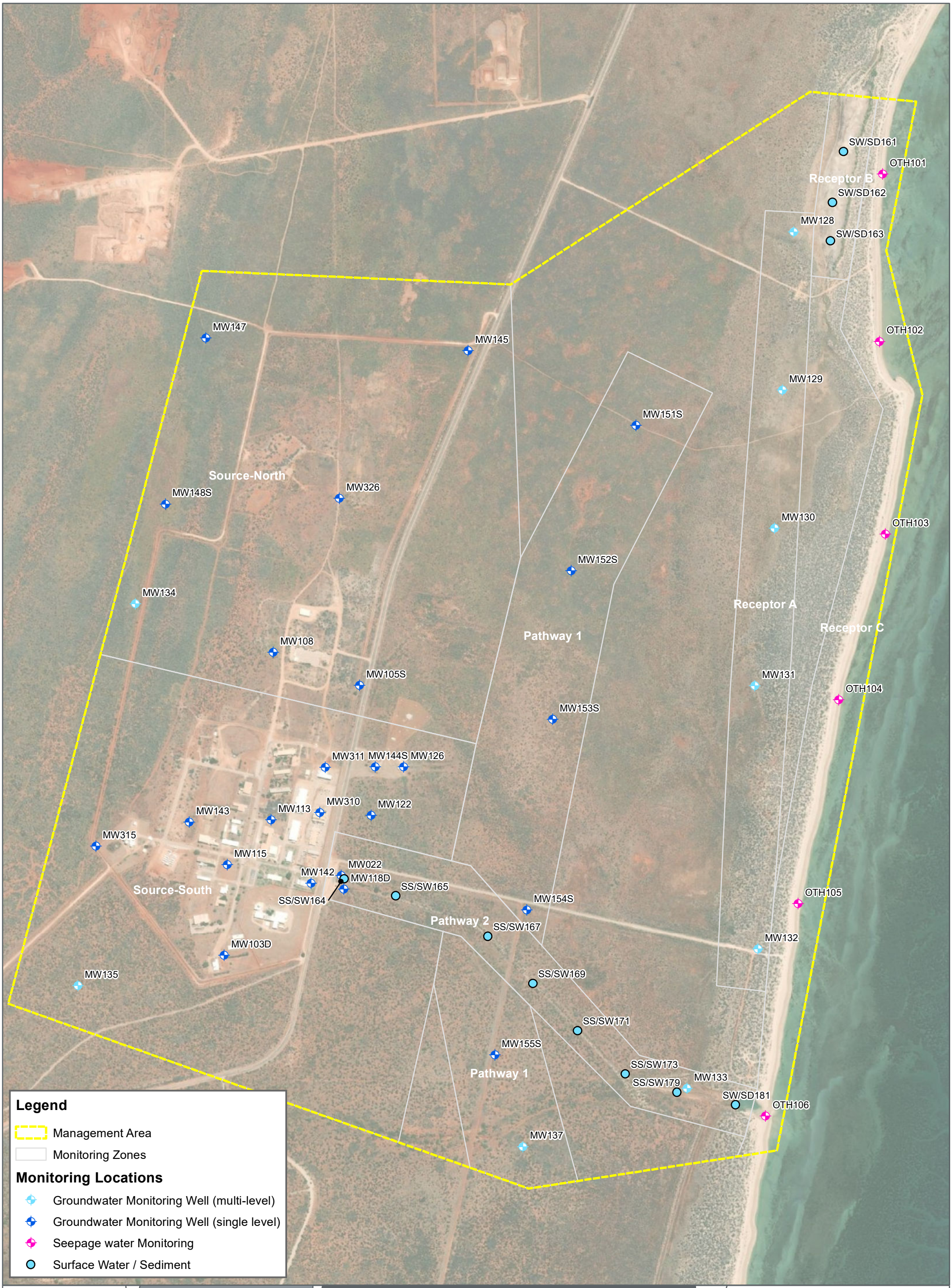


FIGURE 3

1:11,500 Scale at A3

Metres

0 250 500

Monitoring Locations

SAMPLING AND ANALYSIS QUALITY PLAN
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-02-27 | Project: DEF19009
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-003_MonitoringLocations 03.mxd
Aerial Imagery Supplied by Google Earth



APPENDIX

B

Full PFAS Analytical Suite

Full PFAS Analytical Suite

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

APPENDIX

C

FACTUAL REPORTS

Cardno

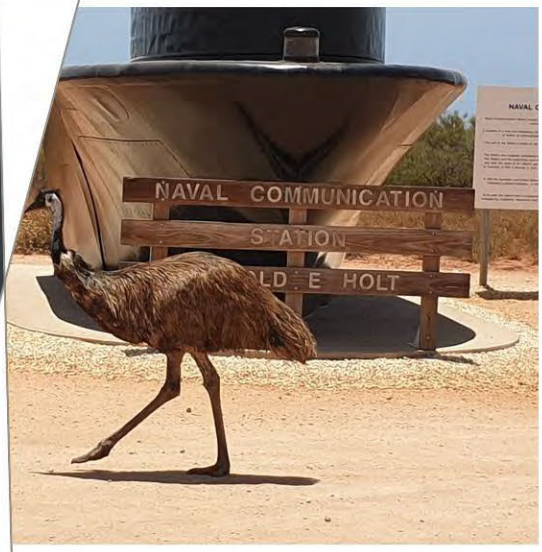
now

Stantec

PFAS OMP Biannual Monitoring Event Factual Report

November 2022

Naval Communication Station Harold E Holt Area B



Prepared for
Department of Defence

14 February 2023

Cardno

now

Stantec

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

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Chemical Names

DOC	Dissolved Organic Carbon
DO	Dissolved Oxygen
PFAS	Per- and Poly-fluoroalkyl Substances
PFHxS	Per-fluoro-hexane Sulphonate
PFOA	Per-fluoro-octanoic Acid
PFOS	Per-fluoro-octane Sulfonate
TDS	Total Dissolved Solids (salinity of water)
TSS	Total Suspended Solids

Technical Terms

AFFF	Aqueous Film-Forming Foam
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
AS	Australian Standard
BGL	Below Ground Level
COC	Chain of Custody
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
EC	Electrical Conductivity
EPA	Environment Protection Authority
ERA	Ecological Risk Assessment
ESA	Environmental Site Assessment
HIL	Health Investigation Level
HSL	Health Screening Level
LOR	Limit of Reporting
N/A	Not Applicable
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environmental Protection Measure
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
SAQP	Sampling and Analysis Quality Plan
SWL	Standing Water Level

Units

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

Site Specific

HEH-B	Naval Communication Station Harold E Holt Area B
OMP	Ongoing Monitoring Plan
WWTP	Waste water treatment plant

1 Introduction

1.1 Background

Cardno, now Stantec ("Cardno") was engaged by the Australian Department of Defence ("the Client") to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) biannual sampling event at the Naval Communication Station Harold E Holt - Area B ("HEH-B" or "the site"). The site is situated at the end of the North West Cape of Western Australia (WA), at the northern edge of Exmouth (Figure 1, Appendix A).

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

> Cardno, 1 November 2022, Reference: 304700525, '*PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) Naval Communication Station Harold Holt B' Rev 6*.

The SAQP was reviewed prior to the monitoring event and the following changes were made:

> The methodology for groundwater field parameters recording was updated.

For the purposes of this report:

> "the site" was defined as Harold E Holt – Area B.

> "the Management Area" was defined as comprising the site, plus the land extending to the Exmouth Gulf (to the east and north-east) (Figure 2, Appendix A).

1.2 Purpose & Objectives

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

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

The objectives of the report are:

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

> To provide confirmation of the current understanding of risk.

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

1.3 Relevant Guidelines

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

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

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

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

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

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

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

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

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

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

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

2 Scope of Work

Cardno carried out the tasks detailed in the following sections in order to satisfy the purpose and objectives of this assessment.

2.1 Groundwater Monitoring

Sampling of selected groundwater wells was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The groundwater wells monitored as part of the OMP are presented in Table 2-1, and are shown on Figure 4, Appendix A.

Table 2-1 Groundwater Monitoring Locations

Monitoring Area	Location ID	Number
On-site – Source South	MW310, MW311, MW315, MW103D, MW113, MW115, MW142, MW143	8
Off-site – Source South	MW135, MW122, MW126, MW144S	4
On-site – Source North	MW326, MW105S, MW109, MW145	4
Off-site – Source North	MW134, MW147, MW148S	3
Off-site - Pathway 1	MW151S, MW152S, MW153S, MW154S, MW137, MW155S	6
Off-site - Pathway 2	MW118D, MW133, MW022	3
Off-site - Receptor A	MW128, MW129, MW130, MW131, MW132	5

2.2 Seepage water Monitoring

Sampling of selected seepage water monitoring locations was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The seepage water locations monitored as part of the OMP are presented in Table 2-2 and are shown on Figure 4, Appendix A.

Table 2-2 Seepage water Monitoring Locations

Monitoring Area	Location ID	Number
Off-site - Receptor C	OTH101, OTH102, OTH103, OTH104, OTH105, OTH106	6

2.3 Surface water Monitoring

Sampling of selected surface water monitoring locations was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The surface water locations monitored as part of the OMP are presented in Table 2-3 and are shown on Figure 4, Appendix A.

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

Table 2-3 Surface water Monitoring Locations

Monitoring Area	Location ID	Number
Off-site - Pathway 2	SW164, SW181, SW165, SW167, SW169, SW171, SW173, SW179	8
Off-site - Receptor B	SW161, SW162, SW163	3

2.4 Sediment Monitoring

Sampling of selected sediment monitoring locations was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The sediment locations monitored as part of the OMP are presented in Table 2-4 and are shown on Figure 5, Appendix A.

Table 2-4 Sediment Monitoring Locations

Monitoring Area	Location ID	Number
Off-site - Pathway 2	SD164, SD181, SS165, SS167, SS169, SS171, SS173, SS179	8
Off-site - Receptor B	SD161, SD162, SD163	3
Note: 'SS' prefix indicates a shallow soil (dry) location, 'SD' prefix a sediment (wet) location		

2.5 Data Management

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

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

2.6 Deviations from the OMP SAQP

Deviations from the SAQP (Cardno, 2022) for the November 2022 monitoring event are presented in Table 2-5.

Table 2-5 Summary of deviations from the OMP SAQP

Location	Deviation	Comments
SW161, SW162, SW163, SW164, SW165	Not Sampled	These surface water monitoring locations were found dry. Limited impact on the OMP, sediment data collected at the co-located monitoring locations.
MW122	Not Analysed	No sample was analysed for this well due to the sample being misplaced in the field. Minimal impact – No data was collected for this well for the November 2022 monitoring round, however it is noted concentrations of Sum of PFOS and PFHxS recorded at MW122 have been consistent, with concentrations ranging from 1.66 µg/L to 3.41 µg/L. In addition to this, concentrations of Sum of PFOS and PFHxS have previously displayed a stable trend[1]. Data assessment and interpretation for MW122, which is located in source area south, can be drawn upon nearby wells (MW144S - 0.14 km, north; MW310 - 0.17 km, west and MW126 - 0.21 km, north-east) in the same source area screened at similar depths.
MW126	No Field Parameters Recorded	This monitoring well had no field parameters recorded due to the field parameters erased from the data collection mobile application. Limited impact on the OMP – No field parameters were collected for this monitoring round; however previous field data indicates the field parameters are consistent between monitoring rounds.

[1] Cardno, October 2022, draft PFAS OMP Annual Interpretive Report, HEH-B

Location	Deviation	Comments
MW109	Not Sampled	Monitoring well was inaccessible in dense bushland. No impact on the OMP as MW108 downgradient was sampled instead.
MW108	Sampled	Sampled instead of MW109 (inaccessible). Positive impact on the OMP, it is recommended that this monitoring well is adopted as alternative sampling location for MW109.

3 Methodology

3.1 Groundwater Sampling Methodology

Groundwater monitoring was undertaken applying the methods detailed in Table 3-1.

Table 3-1 Groundwater Sampling Method

Activity	Details
Well Gauging	Standing Water Level (SWL) were gauged using an interface probe. All wells were measured against a surveyed mark at the top of the well casing.
Groundwater Field Parameters	Groundwater field parameters were recorded prior to deployment of HydraSleeves® or pre-sample collection. The following field parameters were recorded using a water quality meter: ▪ pH. ▪ electrical conductivity (EC). ▪ oxidation reduction potential (ORP). ▪ Dissolved oxygen (DO). ▪ Temperature. Once field parameters have stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurement were recorded on field data records. All field instruments (e.g. water quality meter) were calibrated by the equipment supplier and bump tested daily to optimise the accuracy of the measurements taken. Calibration certificates and bump tests records are provided in Appendix D.
Deployment and Retrieval of HydraSleeves® (single level well sample collection)	HydraSleeves® were deployed with top weight sample collection to begin at the lowest point. HydraSleeve sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. Samples were collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples were discharged immediately (minimise changes in chemistry) via discharge tube. Following sampling, HydraSleeves® were deployed in preparation for the next OMP monitoring event using the same string for consistency between events (same depth of sampling i.e. within screen).
Peristaltic pump (multi-level well sample collection)	The shallowest (non-dry) wells were sampled at each multi-level well location using Teflon-free dedicated and disposable high-density polyethylene (HDPE) tubing coupled to a peristaltic pump system. The groundwater was purged at a low flow rate of 0.2 L/min. SWL and field parameters were measured during purging and post sample collection to ensure limited drawdown effects. The groundwater was sampled when the field parameters had stabilised.
Alternative sampling methodology (hand bailing)	Disposable HDPE hand bailers, attached to a polypropylene string, were used when the water column wasn't sufficient to fill the HydraSleeves®. Purging of the well (removal of 3x well volume) was undertaken prior to sampling to ensure that a sample representative of the aquifer is taken.

Activity	Details
Decontamination procedure	Dedicated HydraSleeves®/tubing were used at each groundwater bore thus removing the need for decontamination. All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample was labelled with the sample location, date, project identification number and sampler's initials. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under Chain of Custody (CoC) documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).
Laboratory Testing	Groundwater samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity, and ionic balance). The primary laboratory was ALS Global Laboratories (Perth), and the secondary laboratory (quality control) was Eurofins ARL (Perth). Both laboratories are NATA-accredited for the parameters tested. Copies of the NATA stamped laboratory reports and CoC documentation are included in Appendix C.
Laboratory Testing – Quality Control	Groundwater QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2022): ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples and sent to a secondary laboratory. ▪ Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)]. ▪ Field blank samples at 1 per day.

3.2 Seepage water Sampling Methodology

Seepage water monitoring procedure is detailed in Table 3-2.

Table 3-2 Seepage water Sampling Method

Activity	Details
Field parameters	The following field parameters were recorded using a water quality meter: ▪ pH. ▪ EC. ▪ ORP. ▪ DO. ▪ Temperature. Field observations such as water flow, odours or sheen presence were also recorded on field sampling sheets.
Sampling Method	Sampling was carried out in a two-hour period; one hour each side of the low tide. Sampling protocol involved a shallow excavation in the beach sand; just above where inundation by wave action is occurring. Sampling containers were be lowered into the exposed seepage water and filled.
Decontamination procedure	All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.

Activity	Details
Sample identification, preservation transport and holding times	Each sample was labelled with the sample location, date, project identification number and sampler's initials. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under CoC documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).
Laboratory Testing	Seepage water samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance).
Laboratory Testing – Quality Control	Seepage water QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2022): ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples and sent to a secondary laboratory. ▪ Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)]. ▪ Field blank samples at 1 per day.

3.3 Surface water Sampling Methodology

Surface water monitoring procedure is detailed in Table 3-3.

Table 3-3 Surface water Sampling Method

Activity	Details
Field parameters	The following field parameters were recorded using a water quality meter: ▪ pH. ▪ EC. ▪ ORP. ▪ DO. ▪ Temperature. Field observations such as water flow, odours or sheen presence were also recorded on field sampling sheets.
Sampling Method	Surface water samples were collected directly into sample containers using a 'Grab' (manual) sample method via a long handled sampling device. Where depth permits, the sample container was positioned at least 10 cm below the surface water level and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films.
Decontamination procedure	All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample was labelled with the sample location, date, project identification number and sampler's initials. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under CoC documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).

Activity	Details
Laboratory Testing	Surface water samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance).
Laboratory Testing – Quality Control	Surface water QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2022): ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples and sent to a secondary laboratory. ▪ Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)]. ▪ Field blank samples at 1 per day.

3.4 Sediment Sampling Methodology

Sediment sampling methodology is detailed in Table 3-4.

Table 3-4 Sediment Sampling Method

Activity	Details
Sample Collection	Sediment samples were collected at the sediment/water interface using hand tools (e.g. trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation. At each sampling location, the sediment sample was visually assessed, and observations (including physical description) recorded on field data sheets.
Field Records	The following information was recorded on the field data sheets: ▪ Sampling time, date, and name of the sampler. ▪ Weather conditions. ▪ Sample Collection method. ▪ Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Laboratory Testing	Sediment samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes).
Laboratory Testing – Quality Control	Sediment QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2022): ▪ Field duplicate (intra-laboratory) samples at 1 per 10 sediment samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 sediment samples and sent to a secondary laboratory. ▪ Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. trowel)]. ▪ Field blank samples at 1 per day.

3.5 Quality Control / Quality Assurance

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

> QA documentation.

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

A detailed review of these aspects has been undertaken, the results of which are presented in Appendix E.

The QA/QC review concluded that there are no significant systematic errors in the data collection process and therefore, the dataset used for the assessment is considered valid and complete.

3.6 Assessment Criteria

3.6.1 Groundwater, Seepage water and surface water

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

Table 3-5 Criteria for Groundwater, Seepage water and Surface water

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	µg/L		
Human Health – Recreational Water	2[1]	10	NHMRC 2019, HEPA 2020
Ecological – 99% species protection	0.00023[2]	19	HEPA 2020

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

3.6.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. Sediment results have been compared to available historical data for the purpose of this assessment.

4 Field Observations and Results

4.1 General Observations

No significant weather event or site activities that could have impacted the monitoring event or results obtained were noted during the November 2022 monitoring event. No rainfall occurred leading to or during the November 2022 monitoring event and the daily maximum temperatures varied between 31.4 and 35.7°C.

4.2 Groundwater

4.2.1 Summary of Field Observations

4.2.1.1 Physicochemical parameters

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the groundwater sampling program are presented in field sampling records, included in Appendix D. Groundwater condition was recorded to be aerobic (DO>0.5 mg/L), fresh to saline [TDS ranging from 312 (MW311) to 36,691 mg/L (MW128)], slightly acidic to near neutral [pH ranging from 5.89 (MW154S) to 7.92 (MW131)] and the average groundwater temperature was 28.3°C. Field parameters were generally consistent with the previous monitoring events.

4.2.1.2 Groundwater Elevation and Migration

Groundwater elevations ranged from 0.088 mAHD (MW130) to 0.767 mAHD (MW153S).

Groundwater flow direction was interpreted to be in a generally easterly direction towards the Exmouth Gulf for the eastern part of the Management Area and towards the north beneath the Base. This is similar to the inferred groundwater contours from the November 2021 monitoring event.

Groundwater elevation contours and flow direction are shown in Figure 3, Appendix A. Gauging records are presented in Appendix D.

4.2.2 Groundwater Laboratory Results

4.2.2.1 PFAS analytes

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

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	10[2]	0.96 (MW144S)	32	0
PFOS	MW022, MW103D, MW105S, MW108, MW113, MW115, MW118D, MW126, MW133, MW142, MW143, MW144S, MW154S, MW310, MW311, MW326	0.01[3]	14.6 (MW115)	32	16
Sum of PFOS and PFHxS	MW022, MW103D, MW105S, MW115, MW118D, MW142, MW143, MW144S, MW310	2[2]	31.4 (MW310)	32	9

Notes:

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

Findings are summarised as follows:

> There was no first-time detection of PFOA or Sum of PFOS and PFHxS or new exceedance of guideline values at the groundwater monitoring locations during the November 2022 monitoring event.

4.2.2.2 Non-PFAS analytes

Tabulated laboratory results for non-PFAS analytes are provided within Appendix B. Results were compared to historical range for each monitoring location. Total anions concentrations ranged from 3.93 (MW311) and 586 (MW128 and MW129) meq/L. Total cations concentrations ranged from 3.42 (MW311) and 676 (MW129) meq/L. Non-PFAS analytes concentrations were of the same order of magnitude as previous monitoring events.

4.3 Seepage water

4.3.1 Summary of Field Observations

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the seepage water sampling program are presented in field sampling records, included in Appendix D. Seepage water condition was recorded to be aerobic [DO ranging from 3.45 (OTH101) to 4.37 mg/L (OTH104)], saline [TDS ranging from 35,337 (OTH102) to 36,071 mg/L (OTH101)], near neutral [pH ranging from 8.06 (OTH101) to 8.19 (OTH103)] and the average seepage water temperature was 22.7°C. Field parameters were generally consistent with the previous monitoring events.

4.3.2 Laboratory Results

4.3.2.1 PFAS analytes

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

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

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	10[2]	<0.01	6	0
PFOS	-	0.01[3]	<0.01	6	0
Sum of PFOS and PFHxS	-	2[2]	<0.01	6	0

Notes:

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

Findings are summarised as follows:

> All six seepage water samples reported PFAS concentrations below the laboratory LOR.

> There was no first-time detection of PFOA or Sum of PFOS and PFHxS at the seepage water monitoring locations during the November 2022 monitoring event.

> No new exceedance of a guideline value was reported for any of the seepage water monitoring locations during the November 2022 monitoring event.

4.3.2.2 Non-PFAS analytes

Tabulated laboratory results for non-PFAS analytes are provided within Appendix B. Results were compared to historical range for each monitoring location. Total anions concentrations ranged from 598 (OTH106) and 610 (OTH103 and OTH 104) meq/L. Total cations concentrations ranged from 631 (OTH106) and 688

(OTH105) meq/L. Non-PFAS analytes concentrations were of the same order of magnitude as previous monitoring events.

4.4 Surface water

4.4.1 Summary of Field Observations

Surface water sampling was limited by all, but one (SW181) monitoring locations found dry. Only one surface water sample was collected during the November 2022 monitoring event.

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the surface water sampling program are presented in field sampling records, included in Appendix D. Field parameters for SW181 were generally consistent with the previous monitoring events for this location.

4.4.2 Laboratory Results

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

Findings are summarised as follows:

- There was no first-time detection of PFOA or Sum of PFOS and PFHxS at the surface water monitoring location sampled during the November 2022 monitoring event.
- No new exceedance of a guideline value was reported for the surface water monitoring location during the November 2022 monitoring event.
- SW181 reported all PFAS concentration below the laboratory LOR.

4.5 Sediment

4.5.1 Summary of Field Observations

Observations recorded during the sediment sampling program are provided in the field sampling records within Appendix D.

4.5.2 Laboratory Results

Tabulated analytical results including non-PFAS analytes are provided within Appendix B. Laboratory results have been compared to available historical data in order to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA were reported. Figure 5 in Appendix A presents the sediment monitoring locations. The laboratory reports are provided in Appendix C.

Findings are summarised as follows:

- No first-time detection of PFOA or the Sum of PFOS and PFHxS above the LOR was reported during the November 2022 monitoring event.

4.6 Changes to the Monitoring Network Condition

The following change to the monitoring network condition was noted during the November 2022 sampling event:

- MW109 has become inaccessible in overgrown bushland.

5 Summary and Conclusions

Cardno undertook the November 2022 groundwater, seepage water, surface water and sediment monitoring event at HEH-B as part of the PFAS OMP. Sampling and testing was undertaken at 32 monitoring wells, one (1) surface water monitoring location, six (6) seepage water monitoring locations and 11 sediment monitoring locations.

Groundwater levels were gauged in all wells before sampling. Groundwater flow direction was interpreted to be in a generally easterly direction towards the Exmouth Gulf for the eastern part of the Management Area and towards the north beneath the Base. This is similar to the inferred groundwater contours from the November 2021 monitoring event.

The groundwater laboratory results reported the following:

- Of the 32 samples that were tested, PFOS (16 samples) and Sum of PFOS and PFHxS (9 samples) reported concentrations that exceeded the HEPA (2020) ecological guideline value for 99% protection species and HEPA (2020) guideline value for recreational use respectively.
- There was no first-time detection of PFOA or Sum of PFOS and PFHxS or new exceedance of guideline values at the groundwater monitoring locations during the November 2022 monitoring event.

The seepage water laboratory results reported the following:

- All six samples that were tested reported PFAS concentrations below the laboratory LOR.
- No first-time detection of PFOA or Sum of PFOS and PFHxS, or new exceedance of guideline value were reported at any of the seepage water monitoring locations.

The surface water laboratory results reported the following:

- The surface water monitoring location sampled (SW181) reported all PFAS concentration below the laboratory LOR.
- There was no first-time detection of PFOA or Sum of PFOS and PFHxS at the surface water monitoring location sampled (SW181) during the November 2022 monitoring event.

The sediment laboratory results reported the following:

- No first-time detection of PFOA or the Sum of PFOS and PFHxS above the LOR was reported during the November 2022 monitoring event.

It is recommended that MW108 is adopted in the SAQP as an alternative monitoring location for MW109 (inaccessible).

The next OMP sampling event for HEH-B will be the First Flush 2023 monitoring event. An Annual Interpretive Report will be prepared for the July 2021 – June 2022 monitoring period.

6 References

General References

1. Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils*, Part 1 – Non-volatile and semi-volatile compounds.
2. *Contaminated Sites Act 2003*, Western Australia.
3. Department of Defence, May 2021, PFAS OMP Factual Report Guidance Version 0.2.
4. Department of Defence, July 2018 amended August 2019, *Contamination Management Manual*, Annex L *Guidance on Data Management*.
5. Department of the Environment and Energy (2017) in the National Greenhouse and Energy Reporting Scheme Measurement Technical Guidelines for the Estimation of Emissions by Facilities in Australia.
6. Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*.
7. Department of Water and Environment Regulation (DWER), 2018, Perth Groundwater Atlas, (https://maps.water.wa.gov.au/#/webmap/gwm).
8. Environmental Protection Agency (United States EPA), November 2002, Reference: EPA/240/R-02/004, '*Guidance on Environmental Data Verification and Data Validation'.*
9. The Heads of EPAs Australia and New Zealand (HEPA; 2020) PFAS National Environmental Management Plan (NEMP) 2.0, January 2020.
10. National Environment Protection Council (NEPC), 1999, National Environmental Protection (Assessment of Site Contamination) Measure (as amended), registered May 2013.
11. National Health and Medical Research Council (NHMRC) (2011, as updated 2018) National Water Quality Management Strategy Australian Drinking Water Guidelines 6, August 2018
12. NHMRC, August 2019, Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water.
13. Standards Australia/Standards New Zealand (1998) AS5667.1:1998 *'Water Quality – Sampling, Part 1: Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples'*.
14. U.S. Environmental Protection Agency (EPA), 2000, 'Guidance for the Data Quality Objectives Process (EPA QA/G-4)'.
15. USEPA, 2002, 'Guidance on Environmental Data Verification and Data Validation (EPA QA/G-8)'.

Site Specific References

16. Department of Defence, May 2019, Naval Communication Station Harold E Holt – Area B 'PFAS Management Area Plan.
17. Department of Defence, May 2019, Naval Communication Station Harold E Holt – Area B 'PFAS Ongoing Monitoring Plan'
18. GHD Pty Ltd, December 2018, reference: 3135526,'Naval Communication Station Harold E Holt – Area B PFAS Investigations Detailed Site Investigation Report'.
19. GHD Pty Ltd, May 2019, reference: 3135526, 'Harold E Holt B Ecological Risk Assessment'.
20. Cardno, April 2020, PFAS OMP Biannual Monitoring Factual Report, 2019 Post-Winter.
21. Cardno, November 2022, PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) Rev 6.
22. Cardno, July 2020, PFAS OMP First Flush Sampling Event Factual Report.
23. Cardno, February 2021, PFAS OMP Biannual Monitoring Factual Report, 2020 Post Summer, HEH-B
24. Cardno, February 2021, PFAS OMP Biannual Monitoring Factual Report, 2020 Post Winter, HEH-B
25. Cardno, May 2021, PFAS OMP First Flush Sampling Event Factual Report, March 2021, HEH-B
26. Cardno, November 2021, PFAS OMP 2020 Annual Interpretive Report, HEH-B

APPENDIX

A

FIGURES

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FIGURE 1

1:100,000 Scale at A3

Metres

0 1,500 3,000

Site Location

NOVEMBER 2022 BIANNUAL MONITORING EVENT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-02-14 | Project: DEF19009
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-001_RegionalLocation 01.mxd
Aerial Imagery Supplied by Google Earth

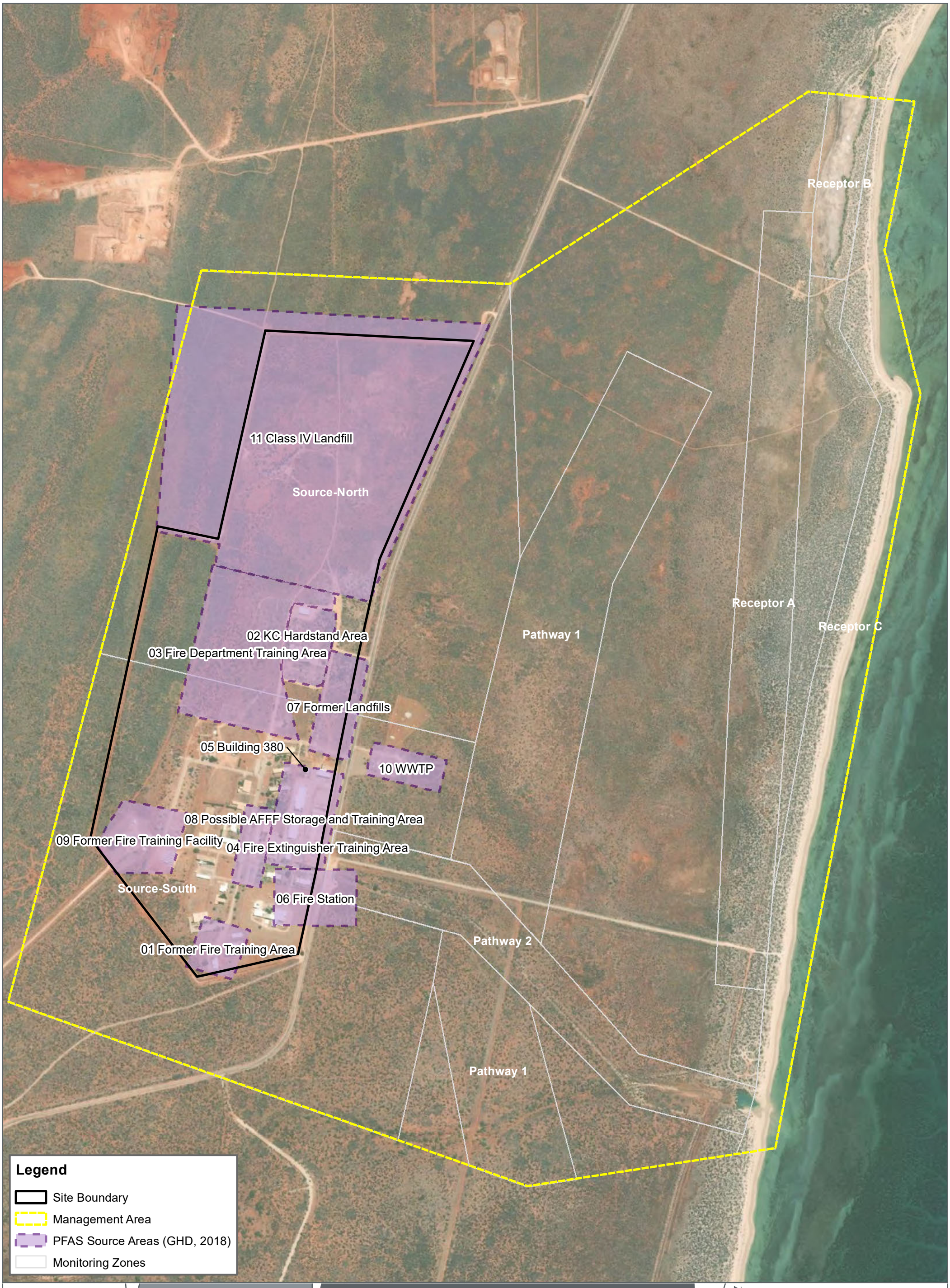


FIGURE 2

1:11,500 Scale at A3

Metres

0 250 500

Management Area

NOVEMBER 2022 BIANNUAL MONITORING EVENT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-02-14 | Project: DEF19009
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-002_ManagementAreas 02.mxd
Aerial Imagery Supplied by Google Earth

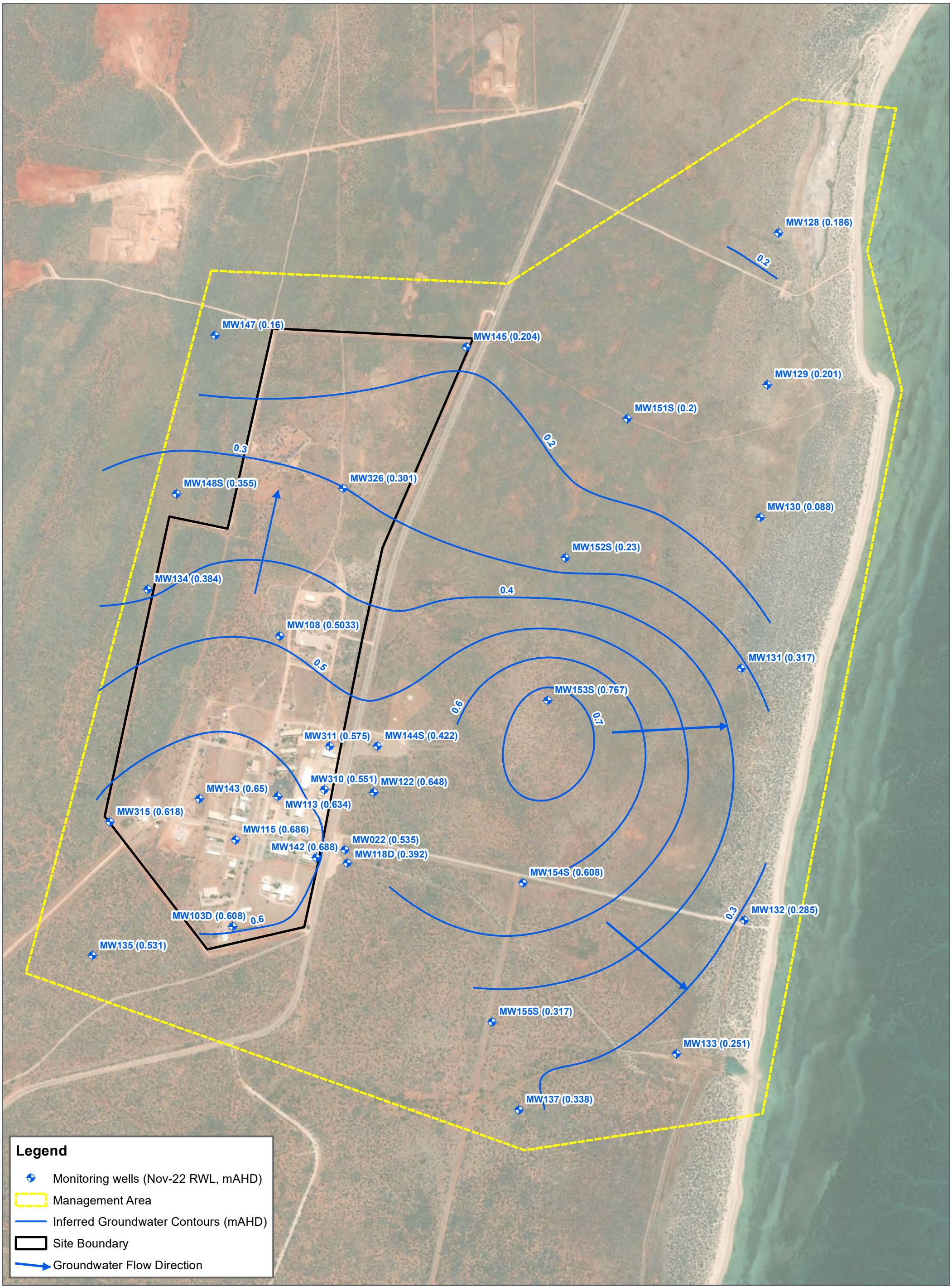


FIGURE 3

1:12,000 Scale at A3

Metres

0 250 500

Inferred Groundwater Contours

NOVEMBER 2022 BIANNUAL MONITORING EVENT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-02-14 | Project: DEF19009
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-003_GroundwaterContoursNov-22 01.mxd
Aerial Imagery Supplied by Google Earth

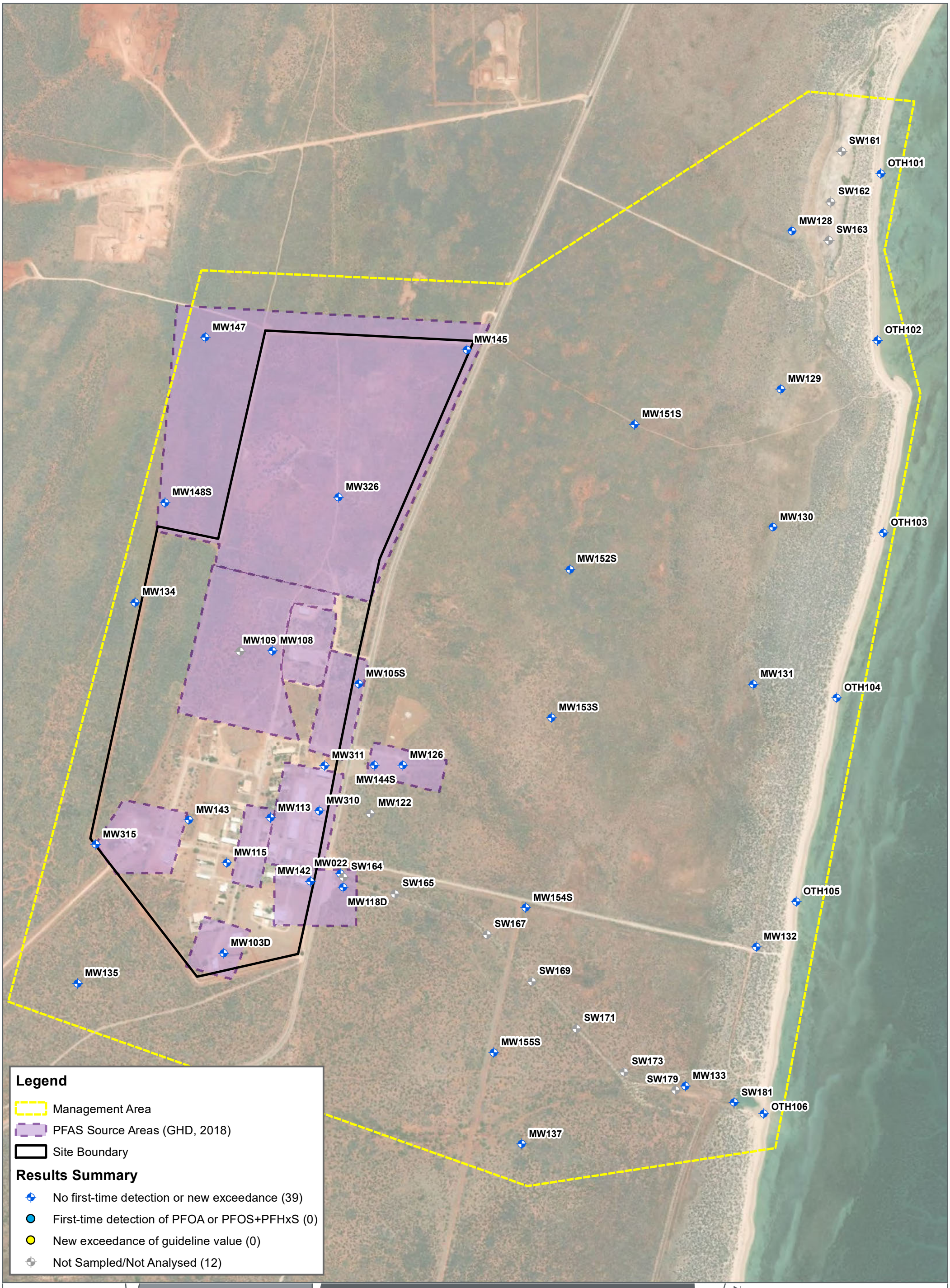


FIGURE 4

1:11,500 Scale at A3

Metres

0 250 500

Monitoring Locations & Results

NOVEMBER 2022 BIANNUAL MONITORING EVENT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-02-14 | Project: DEF19009
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-004_WResults_Nov22 02.mxd
Aerial Imagery Supplied by Google Earth

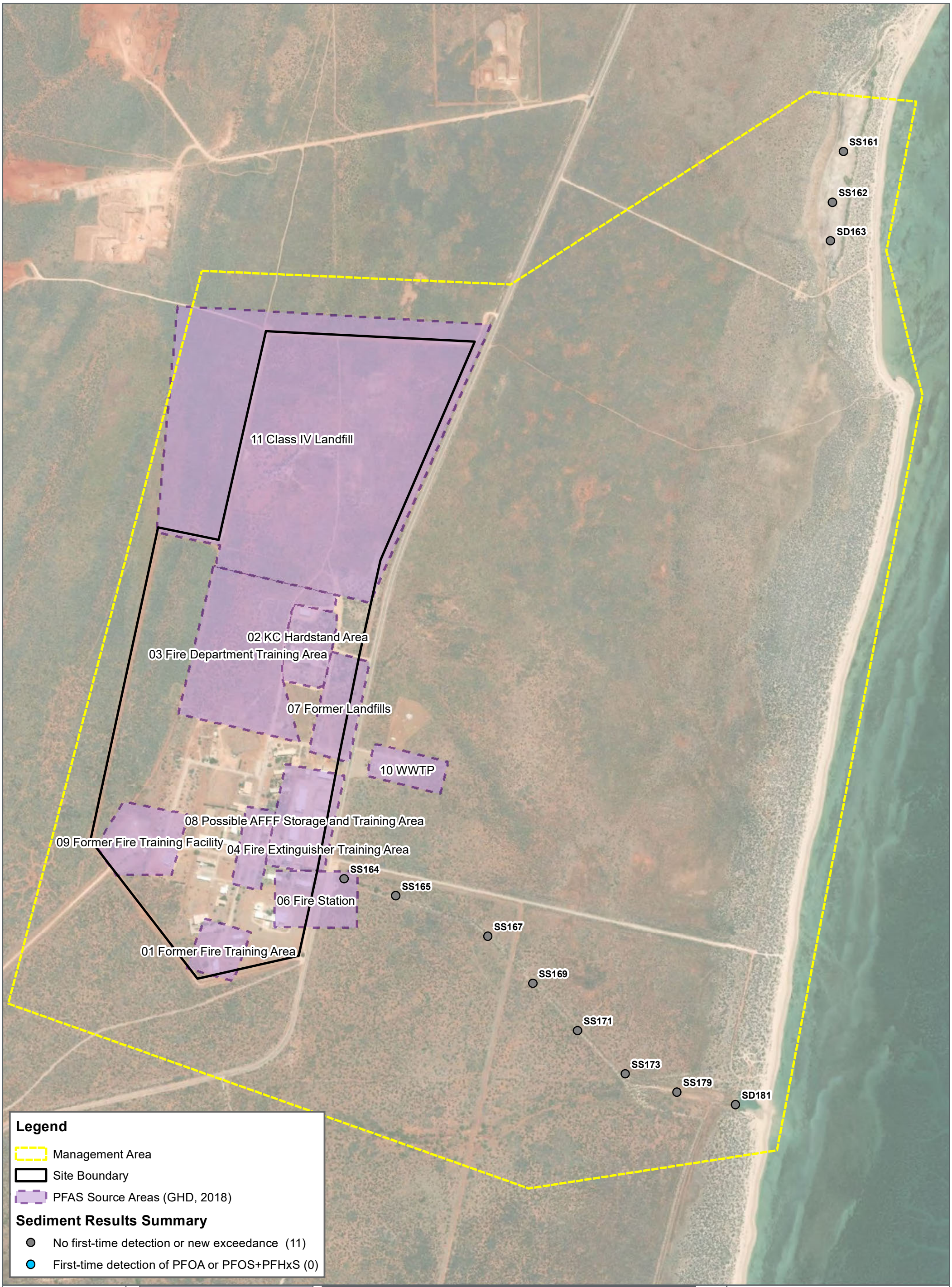


FIGURE 5

1:11,500 Scale at A3

Metres

0 250 500

Sediment Monitoring Locations & Results

NOVEMBER 2022 BIANNUAL MONITORING EVENT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-02-14 | Project: DEF19009
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-005_SResults_Nov22 01.mxd
Aerial Imagery Supplied by Google Earth

APPENDIX

B

DATA ASSESSMENT TABLES

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					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic Acids			
					Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01
PFAS NEMP 2020 Interim Marine 99%									0.00023*						19										
PFAS NEMP 2020 Recreational Water															**10**										
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																					
MW022	**21/11/2022**	**0082_MW022_221121**	**Normal**	**EP2215715**	<0.02	0.02	0.36	0.02	2.39	<0.02	<0.1	0.12	0.12	0.17	0.18	0.24	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW103D	**21/11/2022**	**0082_MW103D_221121**	**Normal**	**EP2215715**	0.27	0.39	2.89	0.14	3.03	<0.02	0.1	0.31	0.76	0.10	0.09	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW105S	**21/11/2022**	**0082_MW105S_221121**	**Normal**	**EP2215643**	0.14	0.25	2.66	0.08	5.60	<0.02	0.4	0.61	1.03	0.99	0.76	0.16	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW108	**21/11/2022**	**0082_MW108_221121**	**Normal**	**EP2215643**	<0.02	<0.02	0.12	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW113	**21/11/2022**	**0082_MW113_221121**	**Normal**	**EP2215715**	0.02	0.02	0.20	<0.02	0.08	<0.02	<0.1	<0.02	0.03	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW115	**21/11/2022**	**0082_MW115_221121**	**Normal**	**EP2215715**	0.22	0.41	4.91	0.29	14.6	<0.02	1.4	3.46	3.16	1.49	0.70	0.06	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	6.15	<0.05	<0.05
MW118D	**21/11/2022**	**0082_MW118D_221121**	**Normal**	**EP2215715**	0.30	0.36	2.08	0.33	10.9	<0.02	0.4	0.87	1.12	0.40	0.70	0.14	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	4.05	0.13	<0.05
MW126	**21/11/2022**	**0082_MW126_221121**	**Normal**	**EP2215715**	<0.02	<0.02	0.18	<0.02	0.34	<0.02	0.3	0.90	0.82	0.23	0.08	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW128	**20/11/2022**	**0082_MW128_3.7-4.2_221120**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW129	**20/11/2022**	**0082_MW129_3.5-4.0_221120**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW130	**20/11/2022**	**0082_MW130_2.9-3.4_221120**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW131	**20/11/2022**	**0082_MW131_4.0-4.5_221120**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW132	**21/11/2022**	**0082_MW132_6.4-6.9_221121**	**Normal**	**EP2215643**	0.04	<0.02	0.17	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.14	<0.05	<0.05
MW133	**21/11/2022**	**0082_MW133_3-3.5_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW134	**21/11/2022**	**0082_MW134_6.6-7.1_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW135	**21/11/2022**	**0082_MW135_10.3-10.8_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW137	**21/11/2022**	**0082_MW137_6.1-6.6_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW142	**21/11/2022**	**0082_MW142_221121**	**Normal**	**EP2215715**	0.16	0.14	1.34	0.27	21.5	<0.02	0.7	1.36	1.07	0.47	0.36	0.09	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	4.00	<0.05	<0.05
MW143	**21/11/2022**	**0082_MW143_221121**	**Normal**	**EP2215715**	0.02	0.04	0.45	0.10	6.73	<0.02	0.6	1.14	1.06	0.88	0.76	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.32	<0.05	<0.05
MW144S	**21/11/2022**	**0082_MW144S_221121**	**Normal**	**EP2215643**	0.21	0.31	2.80	0.18	9.95	<0.02	0.9	2.32	2.22	1.89	0.96	0.32	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.59	0.06	<0.05
MW144S	**21/11/2022**	**0082_QC106_221121**	**Field Duplicate**	**EP2215643**	0.19	0.30	2.67	0.17	9.69	<0.02	0.9	2.26	2.11	1.82	0.92	0.31	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.64	0.07	<0.05
MW144S	**21/11/2022**	**0082_QC206_221120**	**Interlab Duplicate**	**945158**	0.19	0.24	2.7	0.15	13	<0.01	0.80	2.0	1.8	1.6	0.84	0.23	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.54	0.10	<0.01
MW145	**21/11/2022**	**0082_MW145_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW145	**21/11/2022**	**0082_QC104_221121**	**Field Duplicate**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW145	**21/11/2022**	**0082_QC204_221120**	**Interlab Duplicate**	**945158**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01
MW147	**21/11/2022**	**0082_MW147_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW148S	**21/11/2022**	**0082_MW148S_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW151S	**21/11/2022**	**0082_MW151S_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW152S	**21/11/2022**	**0082_MW152S_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW153S	**21/11/2022**	**0082_MW153S_221121**	**Normal**	**EP2215715**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW154S	**21/11/2022**	**0082_MW154S_221121**	**Normal**	**EP2215715**	0.21	0.25	1.15	0.06	0.85	<0.02	<0.1	0.26	0.28	0.11	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW155S	**21/11/2022**	**0082_MW155S_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW310	**21/11/2022**	**0082_MW310_221121**	**Normal**	**EP2215715**	4.25	6.58	27.3	0.46	4.15	<0.02	3.8	11.5	23.0	3.29	0.54	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.64	<0.05	<0.05
MW311	**21/11/2022**	**0082_MW311_221121**	**Normal**	**EP2215715**	<0.02	<0.02	0.17	<0.02	0.32	<0.02	<0.1	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW311	**21/11/2022**	**0082_QC105_221121**	**Field Duplicate**	**EP2215715**	<0.02	<0.02	0.19	<0.02	0.33	<0.02	<0.1	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW311	**21/11/2022**	**0082_QC205_221120**	**Interlab Duplicate**	**945158**	<0.01	<0.01	0.15	<0.01	0.09	<0.01	<0.05	0.02	0.02	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
MW315	**21/11/2022**	**0082_MW315_221121**	**Normal**	**EP2215715**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW315	**21/11/2022**	**0082_QC107_221121**	**Field Duplicate**	**EP2215715**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
MW315	**21/11/2022**	**0082_QC207_221120**	**Interlab Duplicate**	**945158**	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	<0.01
MW326	**21/11/2022**	**0082_MW326_221121**	**Normal**	**EP2215643**	0.03	<0.02	0.09	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
OTH101	**20/11/2022**	**0082_OTH101_221120**	**Normal**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
OTH102	**20/11/2022**	**0082_OTH102_221120**	**Normal**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
OTH102	**20/11/2022**	**0082_QC102_221120**	**Field Duplicate**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
OTH102	**20/11/2022**	**0082_QC202_221120**	**Interlab Duplicate**	**945158**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01
OTH103	**20/11/2022**	**0082_OTH103_221120**	**Normal**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
OTH104	**20/11/2022**	**0082_OTH104_221120**	**Normal**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
OTH105	**20/11/2022**	**0082_OTH105_221120**	**Normal**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
OTH106	**20/11/2022**	**0082_OTH106_221120**	**Normal**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
SW181	**20/11/2022**	**0082_QC103_221120**	**Field Duplicate**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05
SW181	**20/11/2022**	**0082_QC203_221120**	**Interlab Duplicate**	**945158**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01
SW181	**20/11/2022**	**0082_SW181_221120**	**Normal**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

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

Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted based on typical current laboratory limit of reporting (HEPA, 2020)

	PFAS - Perfluoroalkyl Sulfonamides							PFAS			Metals				Inorganics								
	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L
LOR - Limit of Reporting	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01	1	1	1	1	1	1	1	1	0.01	0.01	1	0.01	1
PFAS NEMP 2020 Interim Marine 99%																							
PFAS NEMP 2020 Recreational Water								**2**															

Location Code	Date	Field ID	Sample Type	Lab Report No.																					
MW022	**21/11/2022**	**0082_MW022_221121**	**Normal**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**2.75**	3.34	3.62	38	27	17	34	<1	311	<1	311	6.90	6.03	14	6.71	14
MW103D	**21/11/2022**	**0082_MW103D_221121**	**Normal**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.92**	7.55	8.08	210	122	24	540	<1	177	<1	177	42.4	44.6	1,260	2.56	159
MW105S	**21/11/2022**	**0082_MW105S_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**8.26**	12.2	12.7	16	56	70	951	<1	1,390	<1	1,390	53.9	48.6	636	5.22	394
MW108	**21/11/2022**	**0082_MW108_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	0.14	0.14	54	94	102	2,260	<1	541	<1	541	112	111	2,940	0.19	866
MW113	**21/11/2022**	**0082_MW113_221121**	**Normal**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.28	0.34	0.36	18	24	41	602	<1	613	<1	613	34.1	30.1	644	6.19	176
MW115	**21/11/2022**	**0082_MW115_221121**	**Normal**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**19.5**	36.1	36.8	76	86	70	654	<1	389	<1	389	41.5	41.1	942	0.46	343
MW118D	**21/11/2022**	**0082_MW118D_221121**	**Normal**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**13.0**	21.0	21.8	16	26	55	800	14	532	<1	546	39.4	39.1	906	0.33	141
MW126	**21/11/2022**	**0082_MW126_221121**	**Normal**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.52	2.85	2.87	34	20	17	93	<1	209	<1	209	8.39	7.82	111	3.50	52
MW128	**20/11/2022**	**0082_MW128_3.7-4.2_221120**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	488	1,440	618	11,600	<1	156	<1	156	586	663	18,600	6.21	2,780
MW129	**20/11/2022**	**0082_MW129_3.5-4.0_221120**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	493	1,480	628	11,800	<1	156	<1	156	586	676	18,600	7.10	2,800
MW130	**20/11/2022**	**0082_MW130_2.9-3.4_221120**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	467	1,310	553	10,500	<1	175	<1	175	545	602	17,300	4.98	2,560
MW131	**20/11/2022**	**0082_MW131_4.0-4.5_221120**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	30	26	50	627	<1	254	<1	254	32.9	32.2	943	1.13	60
MW132	**21/11/2022**	**0082_MW132_6.4-6.9_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.17	0.35	0.35	416	1,100	461	8,820	<1	274	<1	274	467	507	14,700	4.08	2,250
MW133	**21/11/2022**	**0082_MW133_3-3.5_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.05	0.05	466	1,190	504	9,730	<1	298	<1	298	499	557	15,700	5.50	2,420
MW134	**21/11/2022**	**0082_MW134_6.6-7.1_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	523	904	324	8,160	<1	276	<1	276	419	464	13,400	5.08	1,700
MW135	**21/11/2022**	**0082_MW135_10.3-10.8_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	122	362	175	4,500	<1	612	<1	612	217	236	5,750	4.19	2,050
MW137	**21/11/2022**	**0082_MW137_6.1-6.6_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	236	472	139	3,600	<1	296	<1	296	208	211	6,510	0.76	867
MW142	**21/11/2022**	**0082_MW142_221121**	**Normal**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**22.8**	31.0	31.5	168	138	59	778	<1	361	<1	361	51.1	55.1	1,410	3.73	199
MW143	**21/11/2022**	**0082_MW143_221121**	**Normal**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**7.18**	13.0	13.1	10	8	30	150	4	398	<1	402	10.1	8.45	58	8.82	20
MW144S	**21/11/2022**	**0082_MW144S_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**12.8**	21.9	22.7	10	7	20	417	3	548	<1	551	22.6	19.7	325	6.82	117
MW144S	**21/11/2022**	**0082_QC106_221121**	**Field Duplicate**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**12.4**	21.3	22.0													
MW144S	**21/11/2022**	**0082_QC206_221120**	**Interlab Duplicate**	**945158**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**15.7**	23.57	24.27													
MW145	**21/11/2022**	**0082_MW145_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	539	1,130	502	10,400	<1	307	<1	307	519	585	16,300	6.02	2,530
MW145	**21/11/2022**	**0082_QC104_221121**	**Field Duplicate**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
MW145	**21/11/2022**	**0082_QC204_221120**	**Interlab Duplicate**	**945158**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
MW147	**21/11/2022**	**0082_MW147_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	462	778	283	6,430	<1	338	<1	338	369	374	11,700	0.66	1,550
MW148S	**21/11/2022**	**0082_MW148S_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	545	958	360	8,310	<1	306	<1	306	440	477	13,900	4.04	1,990
MW151S	**21/11/2022**	**0082_MW151S_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	519	1,380	584	11,000	<1	223	<1	223	568	633	18,100	5.36	2,570
MW152S	**21/11/2022**	**0082_MW152S_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	518	1,220	541	10,200	<1	193	<1	193	547	584	17,400	3.24	2,520
MW153S	**21/11/2022**	**0082_MW153S_221121**	**Normal**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	495	1,080	466	8,830	<1	327	<1	327	474	510	15,000	3.66	2,110
MW154S	**21/11/2022**	**0082_MW154S_221121**	**Normal**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.00	2.94	3.25	347	638	250	5,460	<1	518	<1	518	290	314	8,790	4.01	1,500
MW155S	**21/11/2022**	**0082_MW155S_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	345	562	182	4,570	<1	516	<1	516	241	267	7,360	5.05	1,120
MW310	**21/11/2022**	**0082_MW310_221121**	**Normal**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**31.4**	78.5	85.5	24	41	48	574	<1	660	<1	660	32.8	30.8	489	3.15	278
MW311	**21/11/2022**	**0082_MW311_221121**	**Normal**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.49	0.53	0.53	12	7	13	44	<1	169	<1	169	3.93	3.42	16	6.95	5
MW311	**21/11/2022**	**0082_QC105_221121**	**Field Duplicate**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.52	0.56	0.56	12	7	13	44	<1	166	<1	166	3.87	3.42	16	6.18	5
MW311	**21/11/2022**	**0082_QC205_221120**	**Interlab Duplicate**	**945158**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.24	0.32	0.32													
MW315	**21/11/2022**	**0082_MW315_221121**	**Normal**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	1	2	22	305	41	721	<1	762	16.6	14.0	41	8.43	12
MW315	**21/11/2022**	**0082_QC107_221121**	**Field Duplicate**	**EP2215715**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	1	2	22	303	37	735	<1	772	16.8	14.0	42	9.17	8
MW315	**21/11/2022**	**0082_QC207_221120**	**Interlab Duplicate**	**945158**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.01	0.07	<0.1													
MW326	**21/11/2022**	**0082_MW326_221121**	**Normal**	**EP2215643**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	0.17	0.17	237	697	283	7,640	<1	652	<1	652	382	409	11,500	3.44	2,120
OTH101	**20/11/2022**	**0082_OTH101_221120**	**Normal**	**EP2215641**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	477	1,490	624	11,800	<1	136	<1	136	605	676	19,300	5.52	2,780
OTH102	**20/11/2022**	**0082_OTH102_221120**	**Normal**	**EP2215641**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	454	1,430	596	11,300	<1	132	<1	132	605	647	19,300	3.38	2,770
OTH102	**20/11/2022**	**0082_QC102_221120**	**Field Duplicate**	**EP2215641**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
OTH102	**20/11/2022**	**0082_QC202_221120**	**Interlab Duplicate**	**945158**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
OTH103	**20/11/2022**	**0082_OTH103_221120**	**Normal**	**EP2215641**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	466	1,460	613	11,700	<1	132	<1	132	610	668	19,500	4.49	2,780
OTH104	**20/11/2022**	**0082_OTH104_221120**	**Normal**	**EP2215641**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	469	1,480	618	11,700	<1	134	<1	134	610	670	19,500	4.68	2,750
OTH105	**20/11/2022**	**0082_OTH105_221120**	**Normal**	**EP2215641**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	487	1,530	641	12,000	<1	129	<1	129	605	688	19,300	6.49	2,770
OTH106	**20/11/2022**	**0082_OTH106_221120**	**Normal**	**EP2215641**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	447	1,400	580	11,000	<1	132	<1	132	598	631	19,100	2.67	2,720
SW181	**20/11/2022**	**0082_QC103_221120**	**Field Duplicate**	**EP2215641**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01													
SW181	**20/11/2022**	**0082_QC203_221120**	**Interlab Duplicate**	**945158**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
SW181	**20/11/2022**	**0082_SW181_221120**	**Normal**	**EP2215641**	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	947	3,400	1,210	26,500	<1	208	<1	208	1,320	1,510	42,100	6.89	5,960

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

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

Env Stds Comments
*Practical screening guideline of 0.01 µg/L adopted based on typical current laboratory limit of reporting (HEPA, 2020)

										PFAS - Perfluoroalkyl Carboxylic Acids									
							Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)
							mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting							0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Site ID	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																	
0082	**SD163**	**20/11/2022**	**0082_SD163_221120**	**Normal**	**EP2215642**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0082	**SD181**	**20/11/2022**	**0082_SD181_221120**	**Normal**	**EP2215642**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0082	**SS161**	**20/11/2022**	**0082_SD161_221120**	**Normal**	**EP2215642**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0082	**SS162**	**20/11/2022**	**0082_QC101_221120**	**Field Duplicate**	**EP2215642**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0082	**SS162**	**20/11/2022**	**0082_QC201_221120**	**Interlab Duplicate**	**945158**		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
0082	**SS162**	**20/11/2022**	**0082_SD162_221120**	**Normal**	**EP2215642**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0082	**SS164**	**21/11/2022**	**0082_QC108_221121**	**Field Duplicate**	**EP2215716**		<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0082	**SS164**	**21/11/2022**	**0082_QC208_221120**	**Interlab Duplicate**	**945158**		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
0082	**SS164**	**21/11/2022**	**0082_SD164_221121**	**Normal**	**EP2215716**		<0.0002	<0.0002	0.0002	<0.0002	0.0007	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0082	**SS165**	**21/11/2022**	**0082_SS165_221121**	**Normal**	**EP2215716**		<0.0002	<0.0002	<0.0002	<0.0002	0.0012	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0082	**SS167**	**21/11/2022**	**0082_SS167_221121**	**Normal**	**EP2215642**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0082	**SS169**	**21/11/2022**	**0082_SS169_221121**	**Normal**	**EP2215642**		<0.0002	<0.0002	<0.0002	<0.0002	0.0009	0.0016	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0082	**SS171**	**21/11/2022**	**0082_SS171_221121**	**Normal**	**EP2215642**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0082	**SS173**	**21/11/2022**	**0082_SS173_221121**	**Normal**	**EP2215642**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0082	**SS179**	**21/11/2022**	**0082_SS179_221121**	**Normal**	**EP2215642**		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Note:
First-time detection of PFOA or PFOS+PFHxS

						PFAS - (n:2) Fluorotelomer Sulfonic Acids					PFAS - Perfluoroalkyl Sulfonamides							PFAS		
						Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting						0.0005	0.0005	0.0005	0.0005	0.0005	0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0002	0.0002
Site ID	**Location Code**	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**															
0082	SD163	20/11/2022	0082_SD163_221120	Normal	EP2215642	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0082	SD181	20/11/2022	0082_SD181_221120	Normal	EP2215642	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0082	SS161	20/11/2022	0082_SD161_221120	Normal	EP2215642	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0082	SS162	20/11/2022	0082_QC101_221120	Field Duplicate	EP2215642	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0082	SS162	20/11/2022	0082_QC201_221120	Interlab Duplicate	945158	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
0082	SS162	20/11/2022	0082_SD162_221120	Normal	EP2215642	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0082	SS164	21/11/2022	0082_QC108_221121	Field Duplicate	EP2215716	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0003	0.0003	0.0003
0082	SS164	21/11/2022	0082_QC208_221120	Interlab Duplicate	945158	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.05
0082	SS164	21/11/2022	0082_SD164_221121	Normal	EP2215716	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0009	0.0009	0.0009
0082	SS165	21/11/2022	0082_SS165_221121	Normal	EP2215716	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0012	0.0012	0.0012
0082	SS167	21/11/2022	0082_SS167_221121	Normal	EP2215642	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0082	SS169	21/11/2022	0082_SS169_221121	Normal	EP2215642	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0009	0.0009	0.0025
0082	SS171	21/11/2022	0082_SS171_221121	Normal	EP2215642	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0082	SS173	21/11/2022	0082_SS173_221121	Normal	EP2215642	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
0082	SS179	21/11/2022	0082_SS179_221121	Normal	EP2215642	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Note:
First-time detection of PFOA or PFOS+PFHxS

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids										
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.02	0.02	0.01	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.05
PFAS NEMP 2020 Interim Marine 99%					0.00023						19						
PFAS NEMP 2020 Recreational Water											**10**						
Date	**Field ID**	**Sample Type**	**Lab Report No.**														
20/11/2022	**0082_QC301_221120**	**Rinsate**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
20/11/2022	**0082_QC401_221120**	**Field Blank**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
21/11/2022	**0082_QC301_221121**	**Rinsate**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
21/11/2022	**0082_QC302_221121**	**Rinsate**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
21/11/2022	**0082_QC401_221121**	**Field Blank**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05
21/11/2022	**0082_QC402_221121**	**Field Blank**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05

Environmental Standards

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

HEPA, January 2020, PFAS NEMP 2020 Recreational Water

	PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.05	0.05	0.05	0.05	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01
PFAS NEMP 2020 Interim Marine 99%														
PFAS NEMP 2020 Recreational Water												**2**		

Date	Field ID	Sample Type	Lab Report No.													
20/11/2022	**0082_QC301_221120**	**Rinsate**	**EP2215643**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
20/11/2022	**0082_QC401_221120**	**Field Blank**	**EP2215643**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
21/11/2022	**0082_QC301_221121**	**Rinsate**	**EP2215643**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
21/11/2022	**0082_QC302_221121**	**Rinsate**	**EP2215643**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
21/11/2022	**0082_QC401_221121**	**Field Blank**	**EP2215643**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
21/11/2022	**0082_QC402_221121**	**Field Blank**	**EP2215643**	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01

Environmental Standards

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

HEPA, January 2020, PFAS NEMP 2020 Recreational Water

			Date	20/11/2022	20/11/2022		20/11/2022	20/11/2022		20/11/2022	20/11/2022	
			Field ID	0082_OTH102_221120	0082_QC102_221120		0082_OTH102_221120	0082_QC202_221120		0082_SW181_221120	0082_QC103_221120	
			Lab Report Number	EP2215641	EP2215641	RPD	EP2215641	945158	RPD	EP2215641	EP2215641	RPD
	Unit	LOR										
PFAS - Perfluoroalkyl Sulfonic Acids												
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids												
Perfluorobutanoic acid (PFBA)	µg/L	0.05		<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01		<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids												
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01		<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides												
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02		<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05		<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS												
Sum of PFHxS and PFOS	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0
Sum of PFAS	µg/L	0.01		<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0

**RPDs have only been considered where a concentration is greater than 1 times the LOR.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

			Date	20/11/2022	20/11/2022		21/11/2022	21/11/2022		21/11/2022	21/11/2022	
			Field ID	0082_SW181_221120	0082_QC203_221120		0082_MW311_221121	0082_QC105_221121		0082_MW311_221121	0082_QC205_221120	
			Lab Report Number	EP2215641	945158	RPD	EP2215715	EP2215715	RPD	EP2215715	945158	RPD
	Unit	LOR										
PFAS - Perfluoroalkyl Sulfonic Acids												
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	0.17	0.19	11	0.17	0.15	13
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	0.32	0.33	3	0.32	0.09	**112**
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids												
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.01	0	0.02	0.02	0	0.02	0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	0.02	0.02	0	0.02	0.02	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids												
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides												
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS												
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	0.49	0.52	6	0.49	0.24	**68**
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.05	0	0.53	0.56	6	0.53	0.32	**49**
Sum of PFAS	µg/L	0.01	<0.01	<0.1	0	0.53	0.56	6	0.53	0.32	**49**

			Date	21/11/2022	21/11/2022		21/11/2022	21/11/2022		21/11/2022	21/11/2022	
			Field ID	0082_MW145_221121	0082_QC104_221121		0082_MW145_221121	0082_QC204_221120		0082_MW144S_221121	0082_QC106_221121	
			Lab Report Number	EP2215643	EP2215643	RPD	EP2215643	945158	RPD	EP2215643	EP2215643	RPD
	Unit	LOR										
PFAS - Perfluoroalkyl Sulfonic Acids												
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.21	0.19	10
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.31	0.30	3
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	2.80	2.67	5
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.18	0.17	6
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	9.95	9.69	3
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids												
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	0.9	0.9	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	2.32	2.26	3
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	2.22	2.11	5
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	1.89	1.82	4
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.96	0.92	4
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.32	0.31	3
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids												
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	0.59	0.64	8
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	0.06	0.07	15
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides												
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS												
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	12.8	12.4	3
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	21.9	21.3	3
Sum of PFAS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.1	0	22.7	22.0	3

			Date	21/11/2022	21/11/2022		21/11/2022	21/11/2022		21/11/2022	21/11/2022	
			Field ID	0082_MW144S_221121	0082_QC206_221120		0082_MW315_221121	0082_QC107_221121		0082_MW315_221121	0082_QC207_221120	
			Lab Report Number	EP2215643	945158	RPD	EP2215715	EP2215715	RPD	EP2215715	945158	RPD
	Unit	LOR										
PFAS - Perfluoroalkyl Sulfonic Acids												
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0.21	0.19	10	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	0.31	0.24	**25**	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	2.80	2.7	4	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	0.18	0.15	18	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	9.95	13	**27**	<0.01	<0.01	0	<0.01	0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids												
Perfluorobutanoic acid (PFBA)	µg/L	0.05	0.9	0.80	12	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	2.32	2.0	15	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	2.22	1.8	**21**	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	1.89	1.6	17	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.96	0.84	13	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	0.32	0.23	**33**	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids												
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	0.59	0.54	9	<0.05	<0.05	0	<0.05	0.06	18
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	0.06	0.10	50	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides												
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS												
Sum of PFHxS and PFOS	µg/L	0.01	12.8	15.7	20	<0.01	<0.01	0	<0.01	0.01	0
Sum of PFAS (WA DER List)	µg/L	0.01	21.9	23.57	7	<0.01	<0.01	0	<0.01	0.07	150
Sum of PFAS	µg/L	0.01	22.7	24.27	7	<0.01	<0.01	0	<0.01	<0.1	0

			Date	20/11/2022	20/11/2022		20/11/2022	20/11/2022		21/11/2022	21/11/2022		21/11/2022	21/11/2022	
			Field ID	0082_SD162_221120	0082_QC101_221120		0082_SD162_221120	0082_QC201_221120		0082_SD164_221121	0082_QC108_221121		0082_SD164_221121	0082_QC208_221120	
			Lab Report Number	EP2215642	EP2215642	RPD	EP2215642	945158	RPD	EP2215716	EP2215716	RPD	EP2215716	945158	RPD
	Unit	LOR													
PFAS - Perfluoroalkyl Sulfonic Acids															
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	0.0002	<0.0002	0	0.0002	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	0.0007	0.0003	80	0.0007	<0.005	0
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids															
Perfluorobutanoic acid (PFBA)	mg/kg	0.001		<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids															
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides															
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005		<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0
PFAS															
Sum of PFHxS and PFOS	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.005	0	0.0009	0.0003	100	0.0009	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.01	0	0.0009	0.0003	100	0.0009	<0.01	0
Sum of PFAS	mg/kg	0.0002		<0.0002	<0.0002	0	<0.0002	<0.05	0	0.0009	0.0003	100	0.0009	<0.05	0

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

APPENDIX

C

LABORATORY CERTIFICATES

Cardno

now

Stantec

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2215641

Telephone : -- 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0082_PFASOMP **Client:** STANTEC **Project Manager:** Maella BOURDAIS

Phone: ( )

ALS Compass COC Reference: ~~45067~~ 45066 45122 45142 45069 **# Samples:** **Sampler:** MB ES

Phone: ( )

Turnaround Requirements: Standard ✓ Urgent

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by:	Relinquished by:	Received by:
Date / Time: 22/11/20	Date / Time: 23/11 1130	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) *COC#:* **45066** *ALS Laboratory:* EP Perth

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB SW/OTH - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	Surface Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0082_OTH101		20/11/2022 08:25 AM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
002	0082_OTH102		20/11/2022 09:41 AM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
003	0082_QC102		20/11/2022 09:42 AM	WATER	ALS: 4 Non ALS: 0	No	X			extra PFAS bottles for lab QC
004	0082_OTH103		20/11/2022 10:50 AM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
005	0082_OTH104		20/11/2022 11:10 AM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
006	0082_OTH105		20/11/2022 11:54 AM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
007	0082_OTH106		20/11/2022 12:06 PM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
008	0082_SW181		20/11/2022 12:27 PM	WATER	ALS: 3 Non ALS: 0	No		Partial 4/8		
009	0082_QC103		20/11/2022 12:28 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

(ALS) COC#: **45066** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB SW/OTH - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0082_OTH101	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0082_OTH102	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0082_OTH103	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0082_OTH104	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0082_OTH105	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0082_OTH106	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0082_SW181	Surface Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

COC#: **45066** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB SW/OTH - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0082_OTH101	Clear Plastic Bottle - Natural	500 mL	00070821151265	Green	No	
001	0082_OTH101	HDPE (no PTFE)	20 mL	00350621000113	Grey	No	
001	0082_OTH101	HDPE (no PTFE)	20 mL	00350621036176	Grey	No	
002	0082_OTH102	Clear Plastic Bottle - Natural	500 mL	00070821151322	Green	No	
002	0082_OTH102	HDPE (no PTFE)	20 mL	00350621000264	Grey	No	
002	0082_OTH102	HDPE (no PTFE)	20 mL	00350621000275	Grey	No	
003	0082_QC102	HDPE (no PTFE)	20 mL	00350621000319	Grey	No	
003	0082_QC102	HDPE (no PTFE)	20 mL	00350621000317	Grey	No	
003	0082_QC102	HDPE (no PTFE)	20 mL	00350621035938	Grey	No	
003	0082_QC102	HDPE (no PTFE)	20 mL	00350621035860	Grey	No	
004	0082_OTH103	Clear Plastic Bottle - Natural	500 mL	00070821151334	Green	No	
004	0082_OTH103	HDPE (no PTFE)	20 mL	00350621000265	Grey	No	
004	0082_OTH103	HDPE (no PTFE)	20 mL	00350621000457	Grey	No	
005	0082_OTH104	HDPE (no PTFE)	20 mL	00350621000295	Grey	No	
005	0082_OTH104	HDPE (no PTFE)	20 mL	00350621000463	Grey	No	
005	0082_OTH104	Clear Plastic Bottle - Natural	500 mL	00070821151244	Green	No	
006	0082_OTH105	Clear Plastic Bottle - Natural	500 mL	00070821151267	Green	No	
006	0082_OTH105	HDPE (no PTFE)	20 mL	00350621000416	Grey	No	
006	0082_OTH105	HDPE (no PTFE)	20 mL	00350621000175	Grey	No	
007	0082_OTH106	HDPE (no PTFE)	20 mL	00350621316428	Grey	No	
007	0082_OTH106	Clear Plastic Bottle - Natural	500 mL	00070821151293	Green	No	
007	0082_OTH106	HDPE (no PTFE)	20 mL	00350621000306	Grey	No	
008	0082_SW181	Clear Plastic Bottle - Natural	500 mL	00070821151296	Green	No	
008	0082_SW181	HDPE (no PTFE)	20 mL	00350621000397	Grey	No	
008	0082_SW181	HDPE (no PTFE)	20 mL	00350621000239	Grey	No	
009	0082_QC103	HDPE (no PTFE)	20 mL	00350621000398	Grey	No	

CHAIN OF CUSTODY

COC#: 45066 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB SW/OTH - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

009	0082_QC103	HDPE (no PTFE)	20 mL	00350621036024	Grey	No	

Total Bottle Count: ALS: 27, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2215641**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0082_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp HEHB	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 45066	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: HEHB SW/OTH - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 23-Nov-2022 11:30	Issue Date	: 28-Nov-2022
Client Requested Due Date	: 06-Dec-2022	Scheduled Reporting Date	: **06-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 21.2 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

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

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2215641-001	20-Nov-2022 08:25	0082_OTH101_221120	✓	✓	✓	✓
EP2215641-002	20-Nov-2022 09:41	0082_OTH102_221120	✓	✓	✓	✓
EP2215641-003	20-Nov-2022 09:42	0082_QC102_221120		✓		
EP2215641-004	20-Nov-2022 10:50	0082_OTH103_221120	✓	✓	✓	✓
EP2215641-005	20-Nov-2022 11:10	0082_OTH104_221120	✓	✓	✓	✓
EP2215641-006	20-Nov-2022 11:54	0082_OTH105_221120	✓	✓	✓	✓
EP2215641-007	20-Nov-2022 12:06	0082_OTH106_221120	✓	✓	✓	✓
EP2215641-008	20-Nov-2022 12:27	0082_SW181_221120	✓	✓	✓	✓
EP2215641-009	20-Nov-2022 12:28	0082_QC103_221120		✓		

Proactive Holding Time Report

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

Requested Deliverables

[redacted] [redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2215641**	Page	: 1 of 9
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022 11:30
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 28-Nov-2022
C-O-C number	: 45066	Issue Date	: 06-Dec-2022 09:18
Sampler	: [redacted]		
Site	: HEHB SW/OTH - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0082_OTH101_221120	0082_OTH102_221120	0082_QC102_221120	0082_OTH103_221120	0082_OTH104_221120
				Sampling date / time	20-Nov-2022 08:25	20-Nov-2022 09:41	20-Nov-2022 09:42	20-Nov-2022 10:50	20-Nov-2022 11:10
Compound	CAS Number	LOR	Unit		EP2215641-001	EP2215641-002	EP2215641-003	EP2215641-004	EP2215641-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**136**	**132**	----	**132**	**134**
Total Alkalinity as CaCO3	----	1	mg/L		**136**	**132**	----	**132**	**134**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2780**	**2770**	----	**2780**	**2750**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**19300**	**19300**	----	**19500**	**19500**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**477**	**454**	----	**466**	**469**
Magnesium	7439-95-4	1	mg/L		**1490**	**1430**	----	**1460**	**1480**
Sodium	7440-23-5	1	mg/L		**11800**	**11300**	----	**11700**	**11700**
Potassium	7440-09-7	1	mg/L		**624**	**596**	----	**613**	**618**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**605**	**605**	----	**610**	**610**
ø Total Cations	----	0.01	meq/L		**676**	**647**	----	**668**	**670**
ø Ionic Balance	----	0.01	%		**5.52**	**3.38**	----	**4.49**	**4.68**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0082_OTH101_221120	0082_OTH102_221120	0082_QC102_221120	0082_OTH103_221120	0082_OTH104_221120
				Sampling date / time	20-Nov-2022 08:25	20-Nov-2022 09:41	20-Nov-2022 09:42	20-Nov-2022 10:50	20-Nov-2022 11:10
Compound	CAS Number	LOR	Unit		EP2215641-001	EP2215641-002	EP2215641-003	EP2215641-004	EP2215641-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0082_OTH101_221120	0082_OTH102_221120	0082_QC102_221120	0082_OTH103_221120	0082_OTH104_221120
				Sampling date / time	20-Nov-2022 08:25	20-Nov-2022 09:41	20-Nov-2022 09:42	20-Nov-2022 10:50	20-Nov-2022 11:10
Compound	CAS Number	LOR	Unit		EP2215641-001	EP2215641-002	EP2215641-003	EP2215641-004	EP2215641-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**97.7**	**97.1**	**102**	**101**
13C8-PFOA	----	0.02	%		**102**	**101**	**99.8**	**103**	**102**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0082_OTH105_221120	0082_OTH106_221120	0082_SW181_221120	0082_QC103_221120	----
				Sampling date / time	20-Nov-2022 11:54	20-Nov-2022 12:06	20-Nov-2022 12:27	20-Nov-2022 12:28	----
Compound	CAS Number	LOR	Unit		EP2215641-006	EP2215641-007	EP2215641-008	EP2215641-009	--------
					Result	Result	Result	Result	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		129	132	208	----	----
Total Alkalinity as CaCO3	----	1	mg/L		129	132	208	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2770	2720	5960	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		19300	19100	42100	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		487	447	947	----	----
Magnesium	7439-95-4	1	mg/L		1530	1400	3400	----	----
Sodium	7440-23-5	1	mg/L		12000	11000	26500	----	----
Potassium	7440-09-7	1	mg/L		641	580	1210	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		605	598	1320	----	----
ø Total Cations	----	0.01	meq/L		688	631	1510	----	----
ø Ionic Balance	----	0.01	%		6.49	2.67	6.89	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0082_OTH105_221120	0082_OTH106_221120	0082_SW181_221120	0082_QC103_221120	----
				Sampling date / time	20-Nov-2022 11:54	20-Nov-2022 12:06	20-Nov-2022 12:27	20-Nov-2022 12:28	----
Compound	CAS Number	LOR	Unit		EP2215641-006	EP2215641-007	EP2215641-008	EP2215641-009	--------
					Result	Result	Result	Result	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0082_OTH105_221120	0082_OTH106_221120	0082_SW181_221120	0082_QC103_221120	----
				Sampling date / time	20-Nov-2022 11:54	20-Nov-2022 12:06	20-Nov-2022 12:27	20-Nov-2022 12:28	----
Compound	CAS Number	LOR	Unit		EP2215641-006	EP2215641-007	EP2215641-008	EP2215641-009	--------
					Result	Result	Result	Result	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.6**	**103**	**94.9**	**94.0**	----
13C8-PFOA	----	0.02	%		**96.8**	**98.0**	**99.3**	**93.9**	----

Surrogate Control Limits

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

Inter-Laboratory Testing

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

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

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

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2215641**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 28-Nov-2022
C-O-C number	: 45066	Issue Date	: 06-Dec-2022
Sampler	: [redacted]		
Site	: HEHB SW/OTH - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4735385)									
EP2215641-002	0082_OTH102_221120	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	132	132	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	132	132	0.0	0% - 20%
EP2215523-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	94	92	2.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	94	92	2.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4731318)									
EP2215641-001	0082_OTH101_221120	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2780	2780	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4731317)									
EP2215823-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	440	449	1.8	0% - 20%
EP2215641-001	0082_OTH101_221120	ED045G: Chloride	16887-00-6	1	mg/L	19300	19400	0.2	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4731251)									
EP2215523-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	3220	3530	9.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	597	649	8.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12600	13700	8.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	1180	1290	8.8	0% - 20%
EP2215643-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	467	504	7.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1310	1400	6.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10500	11300	6.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	553	595	7.3	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4739022)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4739022) - continued									
EP2215641-003	0082_QC102_221120	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2215715-010	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	2.89	2.80	3.4	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	3.03	3.08	1.5	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.27	0.25	6.5	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.39	0.38	3.4	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.14	0.14	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4739022)									
EP2215641-003	0082_QC102_221120	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2215715-010	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.09	0.08	11.8	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.31	0.30	4.2	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.76	0.76	0.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.10	0.09	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.1	0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4739022)									
EP2215641-003	0082_QC102_221120	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4739022) - continued									
EP2215641-003	0082_QC102_221120	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2215715-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4739022)									
EP2215641-003	0082_QC102_221120	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2215715-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4739022)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4739022) - continued									
EP2215641-003	0082_QC102_221120	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2215715-010	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	8.08	7.98	1.2	0% - 20%

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4735385)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	87.8	118
				<1	200 mg/L	101	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4731318)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	94.0	89.9	112
				<1	500 mg/L	99.1	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4731317)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	104	88.6	113
				<1	1000 mg/L	97.5	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4731251)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.2	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.1	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.2	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4739022)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	84.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	102	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	92.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	102	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	107	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4739022)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	100	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	95.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	91.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4739022) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	98.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4739022)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	93.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	96.7	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.2	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	97.7	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	89.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4739022)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	98.0	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	102	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	96.6	71.4	144

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4731318)							
EP2215641-001	0082_OTH101_221120	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4731317)							
EP2215641-001	0082_OTH101_221120	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4739022)							
EP2215715-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	94.2	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	106	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4739022) - continued							
EP2215715-001	Anonymous	EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	126	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	122	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4739022)							
EP2215715-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	128	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	112	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	108	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	125	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	119	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	111	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	113	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	112	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	123	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4739022)							
EP2215715-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	115	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	118	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	123	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	120	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	126	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	125	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	112	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4739022)							
EP2215715-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	120	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	# Not Determined	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	121	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	113	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2215641**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022
Site	: HEHB SW/OTH - MB	Issue Date	: 06-Dec-2022
Sampler	: [redacted]	No. of samples received	: 9
Order number	: pfas-omp HEHB	No. of samples analysed	: 9

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2215641--001	0082_OTH101_221120	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2215641--001	0082_OTH101_221120	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2215715--001	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2215715--001	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2215715--001	Anonymous	**Perfluoropentanoic acid (PFPeA)**	2706-90-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2215715--001	Anonymous	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EP2215715--001	Anonymous	**6:2 Fluorotelomer sulfonic acid (6:2 FTS)**	27619-97-2	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
0082_OTH101_221120, 0082_OTH102_221120, 0082_OTH103_221120, 0082_OTH104_221120, 0082_OTH105_221120, 0082_OTH106_221120, 0082_SW181_221120	----	----	----	28-Nov-2022	27-Nov-2022	**1**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0082_OTH101_221120, 0082_OTH102_221120, 0082_OTH103_221120, 0082_OTH104_221120, 0082_OTH105_221120, 0082_OTH106_221120, 0082_SW181_221120	**20-Nov-2022**	**----**	----	----	**29-Nov-2022**	04-Dec-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0082_OTH101_221120, 0082_OTH102_221120, 0082_OTH103_221120, 0082_OTH104_221120, 0082_OTH105_221120, 0082_OTH106_221120, 0082_SW181_221120	**20-Nov-2022**	**----**	----	----	**05-Dec-2022**	18-Dec-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0082_OTH101_221120, 0082_OTH102_221120, 0082_OTH103_221120, 0082_OTH104_221120, 0082_OTH105_221120, 0082_OTH106_221120, 0082_SW181_221120	**20-Nov-2022**	**----**	----	----	**05-Dec-2022**	18-Dec-2022	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0082_OTH101_221120, 0082_OTH102_221120, 0082_OTH103_221120, 0082_OTH104_221120, 0082_OTH105_221120, 0082_OTH106_221120, 0082_SW181_221120	**20-Nov-2022**	**----**	----	----	**28-Nov-2022**	27-Nov-2022	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0082_OTH101_221120, 0082_OTH102_221120, 0082_QC102_221120, 0082_OTH103_221120, 0082_OTH104_221120, 0082_OTH105_221120, 0082_OTH106_221120, 0082_SW181_221120, 0082_QC103_221120	**20-Nov-2022**	**01-Dec-2022**	19-May-2023	✓	**01-Dec-2022**	19-May-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0082_OTH101_221120, 0082_OTH102_221120, 0082_QC102_221120, 0082_OTH103_221120, 0082_OTH104_221120, 0082_OTH105_221120, 0082_OTH106_221120, 0082_SW181_221120, 0082_QC103_221120	**20-Nov-2022**	**01-Dec-2022**	19-May-2023	✓	**01-Dec-2022**	19-May-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0082_OTH101_221120, 0082_OTH102_221120, 0082_QC102_221120, 0082_OTH103_221120, 0082_OTH104_221120, 0082_OTH105_221120, 0082_OTH106_221120, 0082_SW181_221120, 0082_QC103_221120	**20-Nov-2022**	**01-Dec-2022**	19-May-2023	✓	**01-Dec-2022**	19-May-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0082_OTH101_221120, 0082_OTH102_221120, 0082_QC102_221120, 0082_OTH103_221120, 0082_OTH104_221120, 0082_OTH105_221120, 0082_OTH106_221120, 0082_SW181_221120, 0082_QC103_221120	**20-Nov-2022**	**01-Dec-2022**	19-May-2023	✓	**01-Dec-2022**	19-May-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0082_OTH101_221120, 0082_OTH102_221120, 0082_QC102_221120, 0082_OTH103_221120, 0082_OTH104_221120, 0082_OTH105_221120, 0082_OTH106_221120, 0082_SW181_221120, 0082_QC103_221120	**20-Nov-2022**	**01-Dec-2022**	19-May-2023	✓	**01-Dec-2022**	19-May-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	8	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2215642

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0082-PFASOMP **Client:** STANTEC **Project Manager:** Noelle BOURDAIS

Phone: ( )

ALS Compass COC Reference: ~~45066~~ 45122 45142 ~~45067~~ ~~45069~~ **# Samples:** **Sampler:** HB ES

Phone: ( )

Turnaround Requirements: Standard ✓ Urgent

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by:	Relinquished by:	Received by:
Date / Time: 22/11/20	Date / Time: 23/11 1130	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 45067 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB SD - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: Maelle Bourdais CONTACT PH: 0448308372 SAMPLER MOBILE: 0448308372

PRIMARY SAMPLER: Maelle Bourdais QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: maelle.bourdais@stantec.com, derp.labreports@esdat.com.au

EMAIL INVOICES TO: claire.armstrong@stantec.com

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0082_SD161		20/11/2022 08:20 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0082_SD162		20/11/2022 08:40 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0082_QC101		20/11/2022 08:40 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0082_SD163		20/11/2022 08:52 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0082_SD181		20/11/2022 12:24 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0082_SS179		21/11/2022 07:06 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0082_SS173		21/11/2022 07:08 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
008	0082_SS171		21/11/2022 07:10 AM	SOIL	ALS: 1 Non ALS: 0	No	X		
009	0082_SS169		21/11/2022 08:16 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 45067 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB SD - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: Maelle Bourdais

PRIMARY SAMPLER: Maelle Bourdais

CONTACT PH: 0448308372

SAMPLER MOBILE: 0448308372

QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: maelle.bourdais@stantec.com, derp.labreports@esdat.com.au

EMAIL INVOICES TO: claire.armstrong@stantec.com

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0082_SS167		21/11/2022 08:16 AM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 45067 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB SD - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: Maelle Bourdais CONTACT PH: 0448308372 SAMPLER MOBILE: 0448308372

PRIMARY SAMPLER: Maelle Bourdais QUOTE NO: SY/139/19 B / ES2022MWHAUS0002

EMAIL REPORTS TO: maelle.bourdais@stantec.com, derp.labreports@esdat.com.au

EMAIL INVOICES TO: claire.armstrong@stantec.com

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0082_SD161	HDPE Soil Jar	200 mL	00620322006770	Grey	No	
002	0082_SD162	HDPE Soil Jar	200 mL	00620322006979	Grey	No	
003	0082_QC101	HDPE Soil Jar	200 mL	00620322041473	Grey	No	
004	0082_SD163	HDPE Soil Jar	200 mL	00620322006834	Grey	No	
005	0082_SD181	HDPE Soil Jar	200 mL	00620322041485	Grey	No	
006	0082_SS179	HDPE Soil Jar	200 mL	00621019025016	Grey	No	
007	0082_SS173	HDPE Soil Jar	200 mL	00620322007071	Grey	No	
008	0082_SS171	HDPE Soil Jar	200 mL	00620322006772	Grey	No	
009	0082_SS169	HDPE Soil Jar	200 mL	00620322041530	Grey	No	
010	0082_SS167	HDPE Soil Jar	200 mL	00620322006822	Grey	No	

Total Bottle Count: ALS: 10, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2215642**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0082_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp HEHB	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 45067	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: HEHB SD - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 23-Nov-2022 11:30	Issue Date	: 28-Nov-2022
Client Requested Due Date	: 06-Dec-2022	Scheduled Reporting Date	: **06-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 21.2 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 10 / 10

General Comments

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

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2215642-001	20-Nov-2022 08:20	0082_SD161_221120	✓	✓
EP2215642-002	20-Nov-2022 08:40	0082_SD162_221120	✓	✓
EP2215642-003	20-Nov-2022 08:40	0082_QC101_221120	✓	✓
EP2215642-004	20-Nov-2022 08:52	0082_SD163_221120	✓	✓
EP2215642-005	20-Nov-2022 12:24	0082_SD181_221120	✓	✓
EP2215642-006	21-Nov-2022 07:06	0082_SS179_221121	✓	✓
EP2215642-007	21-Nov-2022 07:08	0082_SS173_221121	✓	✓
EP2215642-008	21-Nov-2022 07:10	0082_SS171_221121	✓	✓
EP2215642-009	21-Nov-2022 08:16	0082_SS169_221121	✓	✓
EP2215642-010	21-Nov-2022 08:16	0082_SS167_221121	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted] [redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]stantec.com
DERP LAB REPORTS		
- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au
[redacted] [redacted] **(STANTEC)**		
- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]stantec.com
- Chain of Custody (CoC) (COC)	Email	[redacted]stantec.com
- EDI Format - ESDAT (ESDAT)	Email	[redacted]stantec.com
- EDI Format - XTab (XTAB)	Email	[redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2215642**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022 11:30
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 01-Dec-2022
C-O-C number	: 45067	Issue Date	: 06-Dec-2022 09:14
Sampler	: [redacted]		
Site	: HEHB SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Franco Lentini	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0082_SD161_221120	0082_SD162_221120	0082_QC101_221120	0082_SD163_221120	0082_SD181_221120
				Sampling date / time	20-Nov-2022 08:20	20-Nov-2022 08:40	20-Nov-2022 08:40	20-Nov-2022 08:52	20-Nov-2022 12:24
					EP2215642-001	EP2215642-002	EP2215642-003	EP2215642-004	EP2215642-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**20.3**	**41.2**	**42.7**	**32.0**	**22.2**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0082_SD161_221120	0082_SD162_221120	0082_QC101_221120	0082_SD163_221120	0082_SD181_221120
				Sampling date / time	20-Nov-2022 08:20	20-Nov-2022 08:40	20-Nov-2022 08:40	20-Nov-2022 08:52	20-Nov-2022 12:24
Compound	CAS Number	LOR	Unit		EP2215642-001	EP2215642-002	EP2215642-003	EP2215642-004	EP2215642-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**99.0**	**95.5**	**108**	**97.0**	**94.5**
13C8-PFOA	----	0.0002	%		**90.5**	**92.0**	**92.5**	**93.0**	**88.0**

Analytical Results

Sub-Matrix: **SEDIMENT** (Matrix: **SOIL**)

Compound	CAS Number	LOR	Unit	Sample ID	0082_SS179_221121	0082_SS173_221121	0082_SS171_221121	0082_SS169_221121	0082_SS167_221121
				Sampling date / time	21-Nov-2022 07:06	21-Nov-2022 07:08	21-Nov-2022 07:10	21-Nov-2022 08:16	21-Nov-2022 08:16
					EP2215642-006	EP2215642-007	EP2215642-008	EP2215642-009	EP2215642-010
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		<0.1	<0.1	<0.1	**0.2**	**1.0**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0009**	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0016**	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0082_SS179_221121	0082_SS173_221121	0082_SS171_221121	0082_SS169_221121	0082_SS167_221121
				Sampling date / time	21-Nov-2022 07:06	21-Nov-2022 07:08	21-Nov-2022 07:10	21-Nov-2022 08:16	21-Nov-2022 08:16
Compound	CAS Number	LOR	Unit		EP2215642-006	EP2215642-007	EP2215642-008	EP2215642-009	EP2215642-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0025**	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0009**	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0009**	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**92.5**	**94.0**	**99.0**	**103**	**98.5**
13C8-PFOA	----	0.0002	%		**93.5**	**93.0**	**87.0**	**96.0**	**86.0**

Surrogate Control Limits

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

Inter-Laboratory Testing

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

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

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

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2215642**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 01-Dec-2022
C-O-C number	: 45067	Issue Date	: 06-Dec-2022
Sampler	: [redacted]		
Site	: HEHB SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 10		
No. of samples analysed	: 10		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Franco Lentini	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4744648)									
EP2215642-003	0082_QC101_221120	EA055: Moisture Content	----	0.1	%	42.7	41.8	2.2	0% - 20%
EP2216038-010	Anonymous	EA055: Moisture Content	----	0.1	%	9.0	8.9	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4740744)									
EB2235225-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0014	0.0014	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2215642-005	0082_SD181_221120	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4740744)									
EB2235225-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0002	0.0003	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4740744) - continued									
EB2235225-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2215642-005	0082_SD181_221120	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4740744)									
EB2235225-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2215642-005	0082_SD181_221120	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4740744)									
EB2235225-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2215642-005	0082_SD181_221120	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4740744)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4740744)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4740744)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	119	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4740744)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	102	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	88.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	88.4	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4740744) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	95.2	69.2	143

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4740744)							
EB2235225-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	84.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	95.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	105	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	93.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	88.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	99.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4740744)							
EB2235225-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	87.4	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	115	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	120	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	106	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	107	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	109	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	101	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	123	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	113	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	115	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	115	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4740744)							
EB2235225-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	118	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	109	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	116	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	84.1	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	103	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	126	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4740744) - continued							
EB2235225-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	117	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4740744)							
EB2235225-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	92.4	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	96.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	104	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	84.0	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2215642**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022
Site	: HEHB SD - MB	Issue Date	: 06-Dec-2022
Sampler	: [redacted]	No. of samples received	: 10
Order number	: pfas-omp HEHB	No. of samples analysed	: 10

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055) 0082_SD161_221120, 0082_SD162_221120, 0082_QC101_221120, 0082_SD163_221120, 0082_SD181_221120	**20-Nov-2022**	**----**	----	----	**02-Dec-2022**	04-Dec-2022	✓
HDPE Soil Jar (EA055) 0082_SS179_221121, 0082_SS173_221121, 0082_SS171_221121, 0082_SS169_221121, 0082_SS167_221121	**21-Nov-2022**	**----**	----	----	**02-Dec-2022**	05-Dec-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) 0082_SD161_221120, 0082_SD162_221120, 0082_QC101_221120, 0082_SD163_221120, 0082_SD181_221120	**20-Nov-2022**	**01-Dec-2022**	19-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓
HDPE Soil Jar (EP231X) 0082_SS179_221121, 0082_SS173_221121, 0082_SS171_221121, 0082_SS169_221121, 0082_SS167_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) 0082_SD161_221120, 0082_SD162_221120, 0082_QC101_221120, 0082_SD163_221120, 0082_SD181_221120	**20-Nov-2022**	**01-Dec-2022**	19-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓
HDPE Soil Jar (EP231X) 0082_SS179_221121, 0082_SS173_221121, 0082_SS171_221121, 0082_SS169_221121, 0082_SS167_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) 0082_SD161_221120, 0082_SD162_221120, 0082_QC101_221120, 0082_SD163_221120, 0082_SD181_221120	**20-Nov-2022**	**01-Dec-2022**	19-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓
HDPE Soil Jar (EP231X) 0082_SS179_221121, 0082_SS173_221121, 0082_SS171_221121, 0082_SS169_221121, 0082_SS167_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) 0082_SD161_221120, 0082_SD162_221120, 0082_QC101_221120, 0082_SD163_221120, 0082_SD181_221120	**20-Nov-2022**	**01-Dec-2022**	19-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓
HDPE Soil Jar (EP231X) 0082_SS179_221121, 0082_SS173_221121, 0082_SS171_221121, 0082_SS169_221121, 0082_SS167_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) 0082_SD161_221120, 0082_SD162_221120, 0082_QC101_221120, 0082_SD163_221120, 0082_SD181_221120	**20-Nov-2022**	**01-Dec-2022**	19-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓
HDPE Soil Jar (EP231X) 0082_SS179_221121, 0082_SS173_221121, 0082_SS171_221121, 0082_SS169_221121, 0082_SS167_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2215643

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0082-PFASOMP **Client:** STANTEC **Project Manager:** Noella BOURDAIS
Phone: ( )

ALS Compass COC Reference: 45066 45122 45142 45067 45069 **# Samples:** **Sampler:** HB JS
Phone: ( )

Turnaround Requirements: Standard ✓ Urgent

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by:	Relinquished by:	Received by:
Date / Time: 22/11/20	Date / Time: 23/11 1130	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 45069 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - MB

ORDER NO: pfas-omp

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0082_MW128_3.7-4.2		20/11/2022 09:16 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
002	0082_MW129_3.5-4.0		20/11/2022 10:09 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
003	0082_MW130_2.9-3.4		20/11/2022 10:33 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab QC
004	0082_MW131_4.0-4.5		20/11/2022 11:42 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8			extra PFAS bottles for lab QC
005	0082_QC301		20/11/2022 02:57 PM	WATER	ALS: 2 Non ALS: 0	No		X		
006	0082_QC401		20/11/2022 02:57 PM	WATER	ALS: 2 Non ALS: 0	No		X		
007	0082_MW132_6.4-6.9		21/11/2022 06:34 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
008	0082_MW133_3-3.5		21/11/2022 07:03 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8			lab QC
009	0082_MW137_6.1-6.6		21/11/2022 07:44 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

COC#: 45069 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - MB

ORDER NO: pfas-omp

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0082_MW155S		21/11/2022 08:00 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
011	0082_MW109		21/11/2022 10:09 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
012	0082_MW326		21/11/2022 10:32 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
013	0082_MW145		21/11/2022 10:52 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
014	0082_QC104		21/11/2022 10:53 AM	WATER	ALS: 2 Non ALS: 0	No		X		
015	0082_MW144S		21/11/2022 11:22 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
016	0082_QC106		21/11/2022 11:24 AM	WATER	ALS: 4 Non ALS: 0	No		X		lab QC
017	0082_MW147		21/11/2022 12:01 PM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8			lab QC
018	0082_MW148S		21/11/2022 12:23 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			

CHAIN OF CUSTODY

ALS COC#: 45069 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	Rinsate WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0082_MW134_6.6-7.1		21/11/2022 12:44 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
020	0082_MW135_10.3-10.8_221121		21/11/2022 01:24 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
021	0082_MW152S		21/11/2022 02:03 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
022	0082_MW151S		21/11/2022 02:27 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
023	0082_MW105S		21/11/2022 02:40 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8			
024	0082_QC301		21/11/2022 03:06 PM	WATER	ALS: 2 Non ALS: 0	No		X		
025	0082_QC302		21/11/2022 03:06 PM	WATER	ALS: 2 Non ALS: 0	No		X		
026	0082_QC401		21/11/2022 03:05 PM	WATER	ALS: 2 Non ALS: 0	No		X		
027	0082_QC402		21/11/2022 03:05 PM	WATER	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

(ALS) COC#: 45069 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER [redacted]

PRIMARY SAMPLER

EMAIL REPORTS TO

EMAIL INVOICES TO

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0082_MW128_3.7-4.2	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0082_MW129_3.5-4.0	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0082_MW130_2.9-3.4	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0082_MW131_4.0-4.5	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0082_MW132_6.4-6.9	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0082_MW133_3-3.5	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0082_MW137_6.1-6.6	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
010	0082_MW155S	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0082_MW109	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 45069 *ALS Laboratory:* EP Perth

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

012	0082_MW326	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0082_MW145	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0082_MW144S	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
017	0082_MW147	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
018	0082_MW148S	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
019	0082_MW134_6.6-7.1	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
020	0082_MW135_10.3-10.8_221121	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
021	0082_MW152S	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
022	0082_MW151S	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
023	0082_MW105S	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 45069 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0082_MW128_3.7-4.2	Clear Plastic Bottle - Natural	500 mL	00070821151176	Green	No	
001	0082_MW128_3.7-4.2	HDPE (no PTFE)	20 mL	00350621000338	Grey	No	
001	0082_MW128_3.7-4.2	HDPE (no PTFE)	20 mL	00350621000255	Grey	No	
002	0082_MW129_3.5-4.0	Clear Plastic Bottle - Natural	500 mL	00070821151197	Green	No	
002	0082_MW129_3.5-4.0	HDPE (no PTFE)	20 mL	00350621000271	Grey	No	
002	0082_MW129_3.5-4.0	HDPE (no PTFE)	20 mL	00350621036184	Grey	No	
003	0082_MW130_2.9-3.4	HDPE (no PTFE)	20 mL	00350621000309	Grey	No	
003	0082_MW130_2.9-3.4	HDPE (no PTFE)	20 mL	00350621035933	Grey	No	
003	0082_MW130_2.9-3.4	HDPE (no PTFE)	20 mL	00350621000632	Grey	No	
003	0082_MW130_2.9-3.4	HDPE (no PTFE)	20 mL	00350621000278	Grey	No	
003	0082_MW130_2.9-3.4	Clear Plastic Bottle - Natural	500 mL	00070821151216	Green	No	
004	0082_MW131_4.0-4.5	HDPE (no PTFE)	20 mL	00350821036717	Grey	No	
004	0082_MW131_4.0-4.5	HDPE (no PTFE)	20 mL	00350621035995	Grey	No	
004	0082_MW131_4.0-4.5	HDPE (no PTFE)	20 mL	00350621000323	Grey	No	
004	0082_MW131_4.0-4.5	HDPE (no PTFE)	20 mL	00350621000348	Grey	No	
004	0082_MW131_4.0-4.5	Clear Plastic Bottle - Natural	500 mL	00070821151327	Green	No	
005	0082_QC301	HDPE (no PTFE)	20 mL	00350621035927	Grey	No	
005	0082_QC301	HDPE (no PTFE)	20 mL	00350621035953	Grey	No	
006	0082_QC401	HDPE (no PTFE)	20 mL	00350621000634	Grey	No	
006	0082_QC401	HDPE (no PTFE)	20 mL	00350621035989	Grey	No	
007	0082_MW132_6.4-6.9	HDPE (no PTFE)	20 mL	00350821012944	Grey	No	
007	0082_MW132_6.4-6.9	HDPE (no PTFE)	20 mL	00350821012974	Grey	No	
007	0082_MW132_6.4-6.9	Clear Plastic Bottle - Natural	500 mL	00070821057242	Green	No	
008	0082_MW133_3-3.5	HDPE (no PTFE)	20 mL	00350821036603	Grey	No	
008	0082_MW133_3-3.5	HDPE (no PTFE)	20 mL	00350821000260	Grey	No	
008	0082_MW133_3-3.5	HDPE (no PTFE)	20 mL	00350821000205	Grey	No	

CHAIN OF CUSTODY

COC#: 45069 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

008	0082_MW133_3-3.5	HDPE (no PTFE)	20 mL	00350621035934	Grey	No	
008	0082_MW133_3-3.5	Clear Plastic Bottle - Natural	500 mL	00070821151198	Green	No	
009	0082_MW137_6.1-6.6	Clear Plastic Bottle - Natural	500 mL	00070621214731	Green	No	
009	0082_MW137_6.1-6.6	HDPE (no PTFE)	20 mL	00350621035816	Grey	No	
009	0082_MW137_6.1-6.6	HDPE (no PTFE)	20 mL	00350621035869	Grey	No	
010	0082_MW155S	HDPE (no PTFE)	20 mL	00350621000237	Grey	No	
010	0082_MW155S	Clear Plastic Bottle - Natural	500 mL	00070821151273	Green	No	
010	0082_MW155S	HDPE (no PTFE)	20 mL	00350621000280	Grey	No	
011	0082_MW109	HDPE (no PTFE)	20 mL	00350821012786	Grey	No	
011	0082_MW109	HDPE (no PTFE)	20 mL	00350821013008	Grey	No	
011	0082_MW109	Clear Plastic Bottle - Natural	500 mL	00070821039527	Green	No	
012	0082_MW326	HDPE (no PTFE)	20 mL	00350621000315	Grey	No	
012	0082_MW326	Clear Plastic Bottle - Natural	500 mL	00070821151232	Green	No	
012	0082_MW326	HDPE (no PTFE)	20 mL	00350621000300	Grey	No	
013	0082_MW145	Clear Plastic Bottle - Natural	500 mL	00070821151338	Green	No	
013	0082_MW145	HDPE (no PTFE)	20 mL	00350621000229	Grey	No	
013	0082_MW145	HDPE (no PTFE)	20 mL	00350821000386	Grey	No	
014	0082_QC104	HDPE (no PTFE)	20 mL	00350821000228	Grey	No	
014	0082_QC104	HDPE (no PTFE)	20 mL	00350621000474	Grey	No	
015	0082_MW144S	Clear Plastic Bottle - Natural	500 mL	00070821057245	Green	No	
015	0082_MW144S	HDPE (no PTFE)	20 mL	00350821012874	Grey	No	
015	0082_MW144S	HDPE (no PTFE)	20 mL	00350821012790	Grey	No	
016	0082_QC106	HDPE (no PTFE)	20 mL	00350821012713	Grey	No	
016	0082_QC106	HDPE (no PTFE)	20 mL	00350621035992	Grey	No	
016	0082_QC106	HDPE (no PTFE)	20 mL	00350621035918	Grey	No	
016	0082_QC106	HDPE (no PTFE)	20 mL	00350821013013	Grey	No	
017	0082_MW147	HDPE (no PTFE)	20 mL	00350621000516	Grey	No	

CHAIN OF CUSTODY

COC#: 45069 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

017	0082_MW147	HDPE (no PTFE)	20 mL	00350621036173	Grey	No	
017	0082_MW147	Clear Plastic Bottle - Natural	500 mL	00070821151305	Green	No	
017	0082_MW147	HDPE (no PTFE)	20 mL	00350821036627	Grey	No	
017	0082_MW147	HDPE (no PTFE)	20 mL	00352101051335	Grey	No	
018	0082_MW148S	HDPE (no PTFE)	20 mL	00350621000361	Grey	No	
018	0082_MW148S	HDPE (no PTFE)	20 mL	00350621000427	Grey	No	
018	0082_MW148S	Clear Plastic Bottle - Natural	500 mL	00070821151279	Green	No	
019	0082_MW134_6.6-7.1	HDPE (no PTFE)	20 mL	00350621000358	Grey	No	
019	0082_MW134_6.6-7.1	Clear Plastic Bottle - Natural	500 mL	00070821151303	Green	No	
019	0082_MW134_6.6-7.1	HDPE (no PTFE)	20 mL	00350621000337	Grey	No	
020	0082_MW135_10.3-	Clear Plastic Bottle - Natural	500 mL	00070821205339	Green	No	
020	0082_MW135_10.3-	HDPE (no PTFE)	20 mL	00350821000403	Grey	No	
020	0082_MW135_10.3-	HDPE (no PTFE)	20 mL	00350821000291	Grey	No	
021	0082_MW152S	Clear Plastic Bottle - Natural	500 mL	00070821039580	Green	No	
021	0082_MW152S	HDPE (no PTFE)	20 mL	00350821013036	Grey	No	
021	0082_MW152S	HDPE (no PTFE)	20 mL	00350821012991	Grey	No	
022	0082_MW151S	HDPE (no PTFE)	20 mL	00350621000355	Grey	No	
022	0082_MW151S	HDPE (no PTFE)	20 mL	00350621000506	Grey	No	
022	0082_MW151S	Clear Plastic Bottle - Natural	500 mL	00070821151243	Green	No	
023	0082_MW105S	Clear Plastic Bottle - Natural	500 mL	00070821151349	Green	No	
023	0082_MW105S	HDPE (no PTFE)	20 mL	00350621000292	Grey	No	
023	0082_MW105S	HDPE (no PTFE)	20 mL	00350621000297	Grey	No	
024	0082_QC301	HDPE (no PTFE)	20 mL	00350621035979	Grey	No	
024	0082_QC301	HDPE (no PTFE)	20 mL	00350821036376	Grey	No	
025	0082_QC302	HDPE (no PTFE)	20 mL	00350621035996	Grey	No	
025	0082_QC302	HDPE (no PTFE)	20 mL	00350621035943	Grey	No	
026	0082_QC401	HDPE (no PTFE)	20 mL	00350821036677	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 45069 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

026	0082_QC401	HDPE (no PTFE)	20 mL	00350621035940	Grey	No	
027	0082_QC402	HDPE (no PTFE)	20 mL	00350621000649	Grey	No	
027	0082_QC402	HDPE (no PTFE)	20 mL	00350621035939	Grey	No	

Total Bottle Count: ALS: 83, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2215643**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0082_PFASOMP	Page	: 1 of 3
Order number	: pfas-omp HEHB	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 45069	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: HEHB GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 23-Nov-2022 11:30	Issue Date	: 28-Nov-2022
Client Requested Due Date	: 06-Dec-2022	Scheduled Reporting Date	: **06-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 21.2 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 27 / 27

General Comments

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

Sample Container(s)/Preservation Non-Compliances

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

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

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EP2215643-001 : 20-Nov-2022 09:16 : 0082_MW128_3.7-4.2_221120
EP2215643-002 : 20-Nov-2022 10:09 : 0082_MW129_3.5-4.0_221120
EP2215643-003 : 20-Nov-2022 10:33 : 0082_MW130_2.9-3.4_221120
EP2215643-004 : 20-Nov-2022 11:42 : 0082_MW131_4.0-4.5_221120
EP2215643-007 : 21-Nov-2022 06:34 : 0082_MW132_6.4-6.9_221121
EP2215643-008 : 21-Nov-2022 07:03 : 0082_MW133_3-3.5_221121
EP2215643-009 : 21-Nov-2022 07:44 : 0082_MW137_6.1-6.6_221121
EP2215643-019 : 21-Nov-2022 12:44 : 0082_MW134_6.6-7.1_221121
EP2215643-020 : 21-Nov-2022 13:24 : 0082_MW135_10.3-10.8_221121

Summary of Sample(s) and Requested Analysis

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

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2215643-001	20-Nov-2022 09:16	0082_MW128_3.7-4.2_2...	✓	✓	✓	✓
EP2215643-002	20-Nov-2022 10:09	0082_MW129_3.5-4.0_2...	✓	✓	✓	✓
EP2215643-003	20-Nov-2022 10:33	0082_MW130_2.9-3.4_2...	✓	✓	✓	✓
EP2215643-004	20-Nov-2022 11:42	0082_MW131_4.0-4.5_2...	✓	✓	✓	✓
EP2215643-005	20-Nov-2022 14:57	0082_QC301_221120		✓		
EP2215643-006	20-Nov-2022 14:57	0082_QC401_221120		✓		
EP2215643-007	21-Nov-2022 06:34	0082_MW132_6.4-6.9_2...	✓	✓	✓	✓
EP2215643-008	21-Nov-2022 07:03	0082_MW133_3-3.5_221...	✓	✓	✓	✓
EP2215643-009	21-Nov-2022 07:44	0082_MW137_6.1-6.6_2...	✓	✓	✓	✓
EP2215643-010	21-Nov-2022 08:00	0082_MW155S_221121	✓	✓	✓	✓
EP2215643-011	21-Nov-2022 10:09	0082_MW108_221121	✓	✓	✓	✓
EP2215643-012	21-Nov-2022 10:32	0082_MW326_221121	✓	✓	✓	✓
EP2215643-013	21-Nov-2022 10:52	0082_MW145_221121	✓	✓	✓	✓
EP2215643-014	21-Nov-2022 10:53	0082_QC104_221121		✓		
EP2215643-015	21-Nov-2022 11:22	0082_MW144S_221121	✓	✓	✓	✓
EP2215643-016	21-Nov-2022 11:24	0082_QC106_221121		✓		
EP2215643-017	21-Nov-2022 12:01	0082_MW147_221121	✓	✓	✓	✓
EP2215643-018	21-Nov-2022 12:23	0082_MW148S_221121	✓	✓	✓	✓
EP2215643-019	21-Nov-2022 12:44	0082_MW134_6.6-7.1_2...	✓	✓	✓	✓
EP2215643-020	21-Nov-2022 13:24	0082_MW135_10.3-10.8...	✓	✓	✓	✓
EP2215643-021	21-Nov-2022 14:03	0082_MW152S_221121	✓	✓	✓	✓
EP2215643-022	21-Nov-2022 14:27	0082_MW151S_221121	✓	✓	✓	✓
EP2215643-023	21-Nov-2022 14:40	0082_MW105S_221121	✓	✓	✓	✓
EP2215643-024	21-Nov-2022 15:06	0082_QC301_221121		✓		
EP2215643-025	21-Nov-2022 15:06	0082_QC302_221121		✓		
EP2215643-026	21-Nov-2022 15:05	0082_QC401_221121		✓		

			WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2215643-027	21-Nov-2022 15:05	0082_QC402_221121		✓		

Proactive Holding Time Report

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

Requested Deliverables

[redacted] [redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]stantec.com
DERP LAB REPORTS		
- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au
[redacted] [redacted] **(STANTEC)**		
- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]stantec.com
- Chain of Custody (CoC) (COC)	Email	[redacted]stantec.com
- EDI Format - ESDAT (ESDAT)	Email	[redacted]stantec.com
- EDI Format - XTab (XTAB)	Email	[redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2215643**	Page	: 1 of 22
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022 11:30
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 28-Nov-2022
C-O-C number	: 45069	Issue Date	: 06-Dec-2022 23:29
Sampler	: [redacted]		
Site	: HEHB GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 27		
No. of samples analysed	: 27		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

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

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW128_3.7-4.2_221120	0082_MW129_3.5-4.0_221120	0082_MW130_2.9-3.4_221120	0082_MW131_4.0-4.5_221120	0082_MW132_6.4-6.9_221121
				Sampling date / time	20-Nov-2022 09:16	20-Nov-2022 10:09	20-Nov-2022 10:33	20-Nov-2022 11:42	21-Nov-2022 06:34
Compound	CAS Number	LOR	Unit		EP2215643-001	EP2215643-002	EP2215643-003	EP2215643-004	EP2215643-007
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		156	156	175	254	274
Total Alkalinity as CaCO3	----	1	mg/L		156	156	175	254	274
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2780	2800	2560	60	2250
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		18600	18600	17300	943	14700
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		488	493	467	30	416
Magnesium	7439-95-4	1	mg/L		1440	1480	1310	26	1100
Sodium	7440-23-5	1	mg/L		11600	11800	10500	627	8820
Potassium	7440-09-7	1	mg/L		618	628	553	50	461
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		586	586	545	32.9	467
ø Total Cations	----	0.01	meq/L		663	676	602	32.2	507
ø Ionic Balance	----	0.01	%		6.21	7.10	4.98	1.13	4.08
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	0.04
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	0.17
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW128_3.7-4.2_221120	0082_MW129_3.5-4.0_221120	0082_MW130_2.9-3.4_221120	0082_MW131_4.0-4.5_221120	0082_MW132_6.4-6.9_221121
				Sampling date / time	20-Nov-2022 09:16	20-Nov-2022 10:09	20-Nov-2022 10:33	20-Nov-2022 11:42	21-Nov-2022 06:34
Compound	CAS Number	LOR	Unit		EP2215643-001	EP2215643-002	EP2215643-003	EP2215643-004	EP2215643-007
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	**0.14**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0082_MW128_3.7-4.2_221120	0082_MW129_3.5-4.0_221120	0082_MW130_2.9-3.4_221120	0082_MW131_4.0-4.5_221120	0082_MW132_6.4-6.9_221121
				Sampling date / time	20-Nov-2022 09:16	20-Nov-2022 10:09	20-Nov-2022 10:33	20-Nov-2022 11:42	21-Nov-2022 06:34
					EP2215643-001	EP2215643-002	EP2215643-003	EP2215643-004	EP2215643-007
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.35**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.17**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.35**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**94.4**	**100**	**102**	**98.8**
13C8-PFOA	----	0.02	%		**94.9**	**103**	**100**	**98.5**	**99.2**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0082_MW133_3-3.5_221121	0082_MW137_6.1-6.6_221121	0082_MW155S_221121	0082_MW108_221121	0082_MW326_221121
				Sampling date / time	21-Nov-2022 07:03	21-Nov-2022 07:44	21-Nov-2022 08:00	21-Nov-2022 10:09	21-Nov-2022 10:32
					EP2215643-008	EP2215643-009	EP2215643-010	EP2215643-011	EP2215643-012
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**298**	**296**	**516**	**541**	**652**
Total Alkalinity as CaCO3	----	1	mg/L		**298**	**296**	**516**	**541**	**652**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2420**	**867**	**1120**	**866**	**2120**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**15700**	**6510**	**7360**	**2940**	**11500**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**466**	**236**	**345**	**54**	**237**
Magnesium	7439-95-4	1	mg/L		**1190**	**472**	**562**	**94**	**697**
Sodium	7440-23-5	1	mg/L		**9730**	**3600**	**4570**	**2260**	**7640**
Potassium	7440-09-7	1	mg/L		**504**	**139**	**182**	**102**	**283**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**499**	**208**	**241**	**112**	**382**
ø Total Cations	----	0.01	meq/L		**557**	**211**	**267**	**111**	**409**
ø Ionic Balance	----	0.01	%		**5.50**	**0.76**	**5.05**	**0.19**	**3.44**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.03**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	**0.12**	**0.09**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.05**	<0.01	<0.01	**0.02**	**0.03**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW133_3-3.5_221121	0082_MW137_6.1-6.6_221121	0082_MW155S_221121	0082_MW108_221121	0082_MW326_221121
				Sampling date / time	21-Nov-2022 07:03	21-Nov-2022 07:44	21-Nov-2022 08:00	21-Nov-2022 10:09	21-Nov-2022 10:32
Compound	CAS Number	LOR	Unit		EP2215643-008	EP2215643-009	EP2215643-010	EP2215643-011	EP2215643-012
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.02**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW133_3-3.5_221121	0082_MW137_6.1-6.6_221121	0082_MW155S_221121	0082_MW108_221121	0082_MW326_221121
				Sampling date / time	21-Nov-2022 07:03	21-Nov-2022 07:44	21-Nov-2022 08:00	21-Nov-2022 10:09	21-Nov-2022 10:32
Compound	CAS Number	LOR	Unit		EP2215643-008	EP2215643-009	EP2215643-010	EP2215643-011	EP2215643-012
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.05**	<0.01	<0.01	**0.14**	**0.17**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.05**	<0.01	<0.01	**0.14**	**0.12**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.05**	<0.01	<0.01	**0.14**	**0.17**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**99.8**	**102**	**98.2**	**99.4**
13C8-PFOA	----	0.02	%		**97.1**	**106**	**98.2**	**101**	**97.6**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0082_MW145_221121	0082_QC104_221121	0082_MW144S_221121	0082_QC106_221121	0082_MW147_221121
				Sampling date / time	21-Nov-2022 10:52	21-Nov-2022 10:53	21-Nov-2022 11:22	21-Nov-2022 11:24	21-Nov-2022 12:01
					EP2215643-013	EP2215643-014	EP2215643-015	EP2215643-016	EP2215643-017
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	----	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	**3**	----	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**307**	----	**548**	----	**338**
Total Alkalinity as CaCO3	----	1	mg/L		**307**	----	**551**	----	**338**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2530**	----	**117**	----	**1550**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**16300**	----	**325**	----	**11700**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**539**	----	**10**	----	**462**
Magnesium	7439-95-4	1	mg/L		**1130**	----	**7**	----	**778**
Sodium	7440-23-5	1	mg/L		**10400**	----	**417**	----	**6430**
Potassium	7440-09-7	1	mg/L		**502**	----	**20**	----	**283**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**519**	----	**22.6**	----	**369**
ø Total Cations	----	0.01	meq/L		**585**	----	**19.7**	----	**374**
ø Ionic Balance	----	0.01	%		**6.02**	----	**6.82**	----	**0.66**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	**0.21**	**0.19**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	**0.31**	**0.30**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	**2.80**	**2.67**	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	**0.18**	**0.17**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	**9.95**	**9.69**	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	**0.9**	**0.9**	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	**2.32**	**2.26**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**2.22**	**2.11**	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW145_221121	0082_QC104_221121	0082_MW144S_221121	0082_QC106_221121	0082_MW147_221121
				Sampling date / time	21-Nov-2022 10:52	21-Nov-2022 10:53	21-Nov-2022 11:22	21-Nov-2022 11:24	21-Nov-2022 12:01
Compound	CAS Number	LOR	Unit		EP2215643-013	EP2215643-014	EP2215643-015	EP2215643-016	EP2215643-017
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**1.89**	**1.82**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.96**	**0.92**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	**0.32**	**0.31**	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	**0.59**	**0.64**	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	**0.06**	**0.07**	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW145_221121	0082_QC104_221121	0082_MW144S_221121	0082_QC106_221121	0082_MW147_221121
				Sampling date / time	21-Nov-2022 10:52	21-Nov-2022 10:53	21-Nov-2022 11:22	21-Nov-2022 11:24	21-Nov-2022 12:01
Compound	CAS Number	LOR	Unit		EP2215643-013	EP2215643-014	EP2215643-015	EP2215643-016	EP2215643-017
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	**22.7**	**22.0**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**12.8**	**12.4**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**21.9**	**21.3**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**95.4**	**102**	**102**	**100**
13C8-PFOA	----	0.02	%		**101**	**104**	**98.9**	**97.2**	**105**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW148S_221121	0082_MW134_6.6-7.1_221121	0082_MW135_10.3-10.8_221121	0082_MW152S_221121	0082_MW151S_221121
				Sampling date / time	21-Nov-2022 12:23	21-Nov-2022 12:44	21-Nov-2022 13:24	21-Nov-2022 14:03	21-Nov-2022 14:27
Compound	CAS Number	LOR	Unit		EP2215643-018	EP2215643-019	EP2215643-020	EP2215643-021	EP2215643-022
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**306**	**276**	**612**	**193**	**223**
Total Alkalinity as CaCO3	----	1	mg/L		**306**	**276**	**612**	**193**	**223**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**1990**	**1700**	**2050**	**2520**	**2570**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**13900**	**13400**	**5750**	**17400**	**18100**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**545**	**523**	**122**	**518**	**519**
Magnesium	7439-95-4	1	mg/L		**958**	**904**	**362**	**1220**	**1380**
Sodium	7440-23-5	1	mg/L		**8310**	**8160**	**4500**	**10200**	**11000**
Potassium	7440-09-7	1	mg/L		**360**	**324**	**175**	**541**	**584**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**440**	**419**	**217**	**547**	**568**
ø Total Cations	----	0.01	meq/L		**477**	**464**	**236**	**584**	**633**
ø Ionic Balance	----	0.01	%		**4.04**	**5.08**	**4.19**	**3.24**	**5.36**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW148S_221121	0082_MW134_6.6-7.1_221121	0082_MW135_10.3-10.8_221121	0082_MW152S_221121	0082_MW151S_221121
				Sampling date / time	21-Nov-2022 12:23	21-Nov-2022 12:44	21-Nov-2022 13:24	21-Nov-2022 14:03	21-Nov-2022 14:27
Compound	CAS Number	LOR	Unit		EP2215643-018	EP2215643-019	EP2215643-020	EP2215643-021	EP2215643-022
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0082_MW148S_221121	0082_MW134_6.6-7.1_221121	0082_MW135_10.3-10.8_221121	0082_MW152S_221121	0082_MW151S_221121
				Sampling date / time	21-Nov-2022 12:23	21-Nov-2022 12:44	21-Nov-2022 13:24	21-Nov-2022 14:03	21-Nov-2022 14:27
					EP2215643-018	EP2215643-019	EP2215643-020	EP2215643-021	EP2215643-022
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**98.2**	**98.1**	**100**	**98.6**
13C8-PFOA	----	0.02	%		**102**	**101**	**104**	**97.8**	**99.4**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW105S_221121	----	----	----	----
				Sampling date / time	21-Nov-2022 14:40	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2215643-023	--------	--------	--------	--------
					Result	----	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**1390**	----	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**1390**	----	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**394**	----	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**636**	----	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**16**	----	----	----	----
Magnesium	7439-95-4	1	mg/L		**56**	----	----	----	----
Sodium	7440-23-5	1	mg/L		**951**	----	----	----	----
Potassium	7440-09-7	1	mg/L		**70**	----	----	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**53.9**	----	----	----	----
ø Total Cations	----	0.01	meq/L		**48.6**	----	----	----	----
ø Ionic Balance	----	0.01	%		**5.22**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.14**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.25**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**2.66**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.08**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**5.60**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.4**	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.61**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**1.03**	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW105S_221121	----	----	----	----
				Sampling date / time	21-Nov-2022 14:40	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2215643-023	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.99**	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.76**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.16**	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW105S_221121	----	----	----	----
				Sampling date / time	21-Nov-2022 14:40	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2215643-023	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**12.7**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**8.26**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**12.2**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.4**	----	----	----	----
13C8-PFOA	----	0.02	%		**99.0**	----	----	----	----

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0082_QC301_221120	0082_QC401_221120	0082_QC301_221121	0082_QC302_221121	0082_QC401_221121
				Sampling date / time	20-Nov-2022 14:57	20-Nov-2022 14:57	21-Nov-2022 15:06	21-Nov-2022 15:06	21-Nov-2022 15:05
					EP2215643-005	EP2215643-006	EP2215643-024	EP2215643-025	EP2215643-026
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0082_QC301_221120	0082_QC401_221120	0082_QC301_221121	0082_QC302_221121	0082_QC401_221121
				Sampling date / time	20-Nov-2022 14:57	20-Nov-2022 14:57	21-Nov-2022 15:06	21-Nov-2022 15:06	21-Nov-2022 15:05
Compound	CAS Number	LOR	Unit		EP2215643-005	EP2215643-006	EP2215643-024	EP2215643-025	EP2215643-026
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**106**	**99.6**	**99.3**	**106**
13C8-PFOA	----	0.02	%		**102**	**95.2**	**101**	**97.3**	**97.7**

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	0082_QC402_221121	----	----	----	----
				Sampling date / time	21-Nov-2022 15:05	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2215643-027	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	0082_QC402_221121	----	----	----	----
				Sampling date / time	21-Nov-2022 15:05	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2215643-027	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	----	----	----	----
13C8-PFOA	----	0.02	%		**99.4**	----	----	----	----

Surrogate Control Limits

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

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

Inter-Laboratory Testing

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

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

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

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

QUALITY CONTROL REPORT

Work Order	: **EP2215643**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 28-Nov-2022
C-O-C number	: 45069	Issue Date	: 06-Dec-2022
Sampler	: [redacted]		
Site	: HEHB GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 27		
No. of samples analysed	: 27		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4739024)									
EP2215643-002	0082_MW129_3.5-4.0_221120	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	156	160	2.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	156	160	2.6	0% - 20%
EP2215715-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	41	40	4.0	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	721	724	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	762	764	0.2	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 4741492)									
EP2215643-007	0082_MW132_6.4-6.9_221121	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	274	276	0.7	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	274	276	0.7	0% - 20%
EP2215643-019	0082_MW134_6.6-7.1_221121	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	276	278	0.8	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	276	278	0.8	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4731324)									
EP2215643-001	0082_MW128_3.7-4.2_221120	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2780	2760	0.6	0% - 20%
EP2215643-013	0082_MW145_221121	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2530	2540	0.4	0% - 20%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED045G: Chloride by Discrete Analyser (QC Lot: 4731323)									
EP2215643-001	0082_MW128_3.7-4.2_221120	ED045G: Chloride	16887-00-6	1	mg/L	18600	18500	0.9	0% - 20%
EP2215643-013	0082_MW145_221121	ED045G: Chloride	16887-00-6	1	mg/L	16300	16600	1.5	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4731251)									
EP2215523-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	3220	3530	9.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	597	649	8.3	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	12600	13700	8.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	1180	1290	8.8	0% - 20%
EP2215643-003	0082_MW130_2.9-3.4_221120	ED093F: Calcium	7440-70-2	1	mg/L	467	504	7.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1310	1400	6.6	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10500	11300	6.9	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	553	595	7.3	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4731252)									
EP2215643-017	0082_MW147_221121	ED093F: Calcium	7440-70-2	1	mg/L	462	466	0.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	778	785	0.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	6430	6510	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	283	287	1.4	0% - 20%
EP2215715-004	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	12	12	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	7	7	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	44	43	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4738200)									
EP2215643-003	0082_MW130_2.9-3.4_221120	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2215643-016	0082_QC106_221121	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	2.67	2.80	4.4	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	9.69	9.84	1.6	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.19	0.20	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.30	0.32	6.4	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.17	0.18	10.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4738200)									
EP2215643-003	0082_MW130_2.9-3.4_221120	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4738200) - continued									
EP2215643-003	0082_MW130_2.9-3.4_221120	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2215643-016	0082_QC106_221121	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.92	0.98	5.5	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	2.26	2.36	4.5	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.11	2.20	4.1	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	1.82	1.91	4.9	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.31	0.31	0.0	0% - 50%
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.9	0.9	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4738200)									
EP2215643-003	0082_MW130_2.9-3.4_221120	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2215643-016	0082_QC106_221121	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4738200) - continued									
EP2215643-016	0082_QC106_221121	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4738200)									
EP2215643-003	0082_MW130_2.9-3.4_221120	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2215643-016	0082_QC106_221121	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.64	0.61	4.6	0% - 50%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	0.07	0.08	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4738200)									
EP2215643-003	0082_MW130_2.9-3.4_221120	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2215643-016	0082_QC106_221121	EP231X: Sum of PFAS	----	0.01	µg/L	22.0	22.7	2.9	0% - 20%

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4739024)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	87.8	118
				<1	200 mg/L	99.8	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 4741492)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	87.8	118
				<1	200 mg/L	97.7	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4731324)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	89.9	112
				<1	500 mg/L	97.4	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4731323)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	89.0	88.6	113
				<1	1000 mg/L	94.8	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4731251)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.2	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.1	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.2	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4731252)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.4	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.2	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.7	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4738200)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	87.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	114	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	106	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	119	69.0	134

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4738200) - continued								
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	120	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	103	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4738209)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	85.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	108	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	101	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	107	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	97.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	107	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4738200)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	107	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	108	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	112	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	102	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	112	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	116	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4738209)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	111	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	103	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	99.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	113	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4738200)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	108	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	100	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	88.4	62.6	147

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4738200) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	111	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	107	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	104	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4738209)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	98.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	115	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	106	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	107	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	102	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	113	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	100	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4738200)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	119	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	115	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	114	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	103	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4738209)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	107	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	111	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	99.6	71.4	144

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4731324)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4731324) - continued							
EP2215643-001	0082_MW128_3.7-4.2_221120	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4731323)							
EP2215643-001	0082_MW128_3.7-4.2_221120	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4738200)							
EP2215643-004	0082_MW131_4.0-4.5_221120	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	97.8	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	116	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	105	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	109	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	119	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	102	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4738200)							
EP2215643-004	0082_MW131_4.0-4.5_221120	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	108	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	118	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	117	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	114	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	119	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	119	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	118	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	109	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	106	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	99.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	121	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4738200)							
EP2215643-004	0082_MW131_4.0-4.5_221120	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	112	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	125	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	118	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	128	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	126	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	115	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	123	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4738200)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4738200) - continued							
EP2215643-004	0082_MW131_4.0-4.5_221120	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	125	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	116	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	114	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	101	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2215643**	Page	: 1 of 8
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022
Site	: HEHB GW - MB	Issue Date	: 06-Dec-2022
Sampler	: [redacted]	No. of samples received	: 27
Order number	: pfas-omp HEHB	No. of samples analysed	: 27

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2215643--001	0082_MW128_3.7-4.2_221120	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2215643--001	0082_MW128_3.7-4.2_221120	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0082_MW128_3.7-4.2_221120,	0082_MW129_3.5-4.0_221120,	----	----	----	28-Nov-2022	27-Nov-2022	**1**
0082_MW130_2.9-3.4_221120,	0082_MW131_4.0-4.5_221120						

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	33	6.06	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	33	3.03	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0082_MW128_3.7-4.2_221120, 0082_MW129_3.5-4.0_221120, 0082_MW130_2.9-3.4_221120, 0082_MW131_4.0-4.5_221120	**20-Nov-2022**	**----**	----	----	**01-Dec-2022**	04-Dec-2022	✓
Clear Plastic Bottle - Natural (ED037-P)							
0082_MW132_6.4-6.9_221121, 0082_MW133_3-3.5_221121, 0082_MW137_6.1-6.6_221121, 0082_MW155S_221121, 0082_MW109_221121, 0082_MW326_221121, 0082_MW145_221121, 0082_MW144S_221121, 0082_MW147_221121, 0082_MW148S_221121, 0082_MW134_6.6-7.1_221121, 0082_MW135_10.3-10.8_221121, 0082_MW152S_221121, 0082_MW151S_221121, 0082_MW105S_221121	**21-Nov-2022**	**----**	----	----	**01-Dec-2022**	05-Dec-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0082_MW128_3.7-4.2_221120, 0082_MW129_3.5-4.0_221120, 0082_MW130_2.9-3.4_221120, 0082_MW131_4.0-4.5_221120	**20-Nov-2022**	**----**	----	----	**06-Dec-2022**	18-Dec-2022	✓
Clear Plastic Bottle - Natural (ED041G)							
0082_MW132_6.4-6.9_221121, 0082_MW133_3-3.5_221121, 0082_MW137_6.1-6.6_221121, 0082_MW155S_221121, 0082_MW109_221121, 0082_MW326_221121, 0082_MW145_221121, 0082_MW144S_221121, 0082_MW147_221121, 0082_MW148S_221121, 0082_MW134_6.6-7.1_221121, 0082_MW135_10.3-10.8_221121, 0082_MW152S_221121, 0082_MW151S_221121, 0082_MW105S_221121	**21-Nov-2022**	**----**	----	----	**06-Dec-2022**	19-Dec-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0082_MW128_3.7-4.2_221120, 0082_MW129_3.5-4.0_221120, 0082_MW130_2.9-3.4_221120, 0082_MW131_4.0-4.5_221120	**20-Nov-2022**	**----**	----	----	**06-Dec-2022**	18-Dec-2022	✓
Clear Plastic Bottle - Natural (ED045G)							
0082_MW132_6.4-6.9_221121, 0082_MW133_3-3.5_221121, 0082_MW137_6.1-6.6_221121, 0082_MW155S_221121, 0082_MW109_221121, 0082_MW326_221121, 0082_MW145_221121, 0082_MW144S_221121, 0082_MW147_221121, 0082_MW148S_221121, 0082_MW134_6.6-7.1_221121, 0082_MW135_10.3-10.8_221121, 0082_MW152S_221121, 0082_MW151S_221121, 0082_MW105S_221121	**21-Nov-2022**	**----**	----	----	**06-Dec-2022**	19-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0082_MW128_3.7-4.2_221120, 0082_MW129_3.5-4.0_221120, 0082_MW130_2.9-3.4_221120, 0082_MW131_4.0-4.5_221120	**20-Nov-2022**	**----**	----	----	**28-Nov-2022**	27-Nov-2022	×
Clear Plastic Bottle - Natural (ED093F)							
0082_MW132_6.4-6.9_221121, 0082_MW133_3-3.5_221121, 0082_MW137_6.1-6.6_221121, 0082_MW155S_221121, 0082_MW109_221121, 0082_MW326_221121, 0082_MW145_221121, 0082_MW144S_221121, 0082_MW147_221121, 0082_MW148S_221121, 0082_MW134_6.6-7.1_221121, 0082_MW135_10.3-10.8_221121, 0082_MW152S_221121, 0082_MW151S_221121, 0082_MW105S_221121	**21-Nov-2022**	**----**	----	----	**28-Nov-2022**	28-Nov-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0082_MW128_3.7-4.2_221120, 0082_MW129_3.5-4.0_221120, 0082_MW130_2.9-3.4_221120, 0082_MW131_4.0-4.5_221120, 0082_QC301_221120, 0082_QC401_221120	**20-Nov-2022**	**30-Nov-2022**	19-May-2023	✓	**01-Dec-2022**	19-May-2023	✓
HDPE (no PTFE) (EP231X)							
0082_MW132_6.4-6.9_221121, 0082_MW133_3-3.5_221121, 0082_MW137_6.1-6.6_221121, 0082_MW155S_221121, 0082_MW109_221121, 0082_MW326_221121, 0082_MW145_221121, 0082_QC104_221121, 0082_MW144S_221121, 0082_QC106_221121, 0082_MW147_221121, 0082_MW148S_221121, 0082_MW134_6.6-7.1_221121, 0082_MW135_10.3-10.8_221121, 0082_MW152S_221121, 0082_MW151S_221121, 0082_MW105S_221121, 0082_QC301_221121, 0082_QC302_221121, 0082_QC401_221121, 0082_QC402_221121	**21-Nov-2022**	**30-Nov-2022**	20-May-2023	✓	**01-Dec-2022**	20-May-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0082_MW128_3.7-4.2_221120, 0082_MW129_3.5-4.0_221120, 0082_MW130_2.9-3.4_221120, 0082_MW131_4.0-4.5_221120, 0082_QC301_221120, 0082_QC401_221120	**20-Nov-2022**	**30-Nov-2022**	19-May-2023	✓	**01-Dec-2022**	19-May-2023	✓
HDPE (no PTFE) (EP231X)							
0082_MW132_6.4-6.9_221121, 0082_MW133_3-3.5_221121, 0082_MW137_6.1-6.6_221121, 0082_MW155S_221121, 0082_MW109_221121, 0082_MW326_221121, 0082_MW145_221121, 0082_QC104_221121, 0082_MW144S_221121, 0082_QC106_221121, 0082_MW147_221121, 0082_MW148S_221121, 0082_MW134_6.6-7.1_221121, 0082_MW135_10.3-10.8_221121, 0082_MW152S_221121, 0082_MW151S_221121, 0082_MW105S_221121, 0082_QC301_221121, 0082_QC302_221121, 0082_QC401_221121, 0082_QC402_221121	**21-Nov-2022**	**30-Nov-2022**	20-May-2023	✓	**01-Dec-2022**	20-May-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0082_MW128_3.7-4.2_221120, 0082_MW129_3.5-4.0_221120, 0082_MW130_2.9-3.4_221120, 0082_MW131_4.0-4.5_221120, 0082_QC301_221120, 0082_QC401_221120	**20-Nov-2022**	**30-Nov-2022**	19-May-2023	✓	**01-Dec-2022**	19-May-2023	✓
HDPE (no PTFE) (EP231X)							
0082_MW132_6.4-6.9_221121, 0082_MW133_3-3.5_221121, 0082_MW137_6.1-6.6_221121, 0082_MW155S_221121, 0082_MW109_221121, 0082_MW326_221121, 0082_MW145_221121, 0082_QC104_221121, 0082_MW144S_221121, 0082_QC106_221121, 0082_MW147_221121, 0082_MW148S_221121, 0082_MW134_6.6-7.1_221121, 0082_MW135_10.3-10.8_221121, 0082_MW152S_221121, 0082_MW151S_221121, 0082_MW105S_221121, 0082_QC301_221121, 0082_QC302_221121, 0082_QC401_221121, 0082_QC402_221121	**21-Nov-2022**	**30-Nov-2022**	20-May-2023	✓	**01-Dec-2022**	20-May-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0082_MW128_3.7-4.2_221120, 0082_MW129_3.5-4.0_221120, 0082_MW130_2.9-3.4_221120, 0082_MW131_4.0-4.5_221120, 0082_QC301_221120, 0082_QC401_221120	**20-Nov-2022**	**30-Nov-2022**	19-May-2023	✓	**01-Dec-2022**	19-May-2023	✓
HDPE (no PTFE) (EP231X)							
0082_MW132_6.4-6.9_221121, 0082_MW133_3-3.5_221121, 0082_MW137_6.1-6.6_221121, 0082_MW155S_221121, 0082_MW109_221121, 0082_MW326_221121, 0082_MW145_221121, 0082_QC104_221121, 0082_MW144S_221121, 0082_QC106_221121, 0082_MW147_221121, 0082_MW148S_221121, 0082_MW134_6.6-7.1_221121, 0082_MW135_10.3-10.8_221121, 0082_MW152S_221121, 0082_MW151S_221121, 0082_MW105S_221121, 0082_QC301_221121, 0082_QC302_221121, 0082_QC401_221121, 0082_QC402_221121	**21-Nov-2022**	**30-Nov-2022**	20-May-2023	✓	**01-Dec-2022**	20-May-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0082_MW128_3.7-4.2_221120, 0082_MW129_3.5-4.0_221120, 0082_MW130_2.9-3.4_221120, 0082_MW131_4.0-4.5_221120, 0082_QC301_221120, 0082_QC401_221120	**20-Nov-2022**	**30-Nov-2022**	19-May-2023	✓	**01-Dec-2022**	19-May-2023	✓
HDPE (no PTFE) (EP231X)							
0082_MW132_6.4-6.9_221121, 0082_MW133_3-3.5_221121, 0082_MW137_6.1-6.6_221121, 0082_MW155S_221121, 0082_MW109_221121, 0082_MW326_221121, 0082_MW145_221121, 0082_QC104_221121, 0082_MW144S_221121, 0082_QC106_221121, 0082_MW147_221121, 0082_MW148S_221121, 0082_MW134_6.6-7.1_221121, 0082_MW135_10.3-10.8_221121, 0082_MW152S_221121, 0082_MW151S_221121, 0082_MW105S_221121, 0082_QC301_221121, 0082_QC302_221121, 0082_QC401_221121, 0082_QC402_221121	**21-Nov-2022**	**30-Nov-2022**	20-May-2023	✓	**01-Dec-2022**	20-May-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	33	**6.06**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	39	**10.26**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	39	**5.13**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	33	**6.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	33	**3.03**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2215715

Telephone : – 61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0082-PFASOMP **Client:** STANTEC **Project Manager:** Maella BOURDAIS
Phone: ( )

ALS Compass COC Reference: 45066 45122 45142 45067 45069 **# Samples:** **Sampler:** MB JS
Phone: ( )

Turnaround Requirements: Standard ✓ Urgent

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by:	Relinquished by:	Received by:
Date / Time: 22/11/20	Date / Time: 23/11 1130	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) COC#: 45122 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - JS

ORDER NO: pfas-omp HEHB

PROJECT MANAGER [redacted]

PRIMARY SAMPLER

EMAIL REPORTS TO

EMAIL INVOICES TO

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0082_MW142		21/11/2022 09:56 AM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
002	0082_MW310		21/11/2022 10:25 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
003	0082_MW311		21/11/2022 10:40 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
004	0082_QC105		21/11/2022 10:43 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
005	0082_MW113		21/11/2022 11:09 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
006	0082_MW115		21/11/2022 11:27 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
007	0082_MW315		21/11/2022 11:47 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
008	0082_QC107		21/11/2022 11:48 AM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
009	0082_MW143		21/11/2022 12:08 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

(ALS) COC#: 45122 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - JS

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0082_MW103D		21/11/2022 12:25 PM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
011	0082_MW126		21/11/2022 12:42 PM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
012	0082_MW022		21/11/2022 12:59 PM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
~~013~~ SNR	0082_MW118D		21/11/2022 01:35 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		
014	0082_MW154S		21/11/2022 01:58 PM	WATER	ALS: 5 Non ALS: 0	No	Partial 4/8		
015	0082_MW153S		21/11/2022 02:19 PM	WATER	ALS: 3 Non ALS: 0	No	Partial 4/8		

CHAIN OF CUSTODY

ALS COC#: 45122 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - JS

ORDER NO: pfas-omp

PROJECT MANAGER:

PRIMARY SAMPLER:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	PARTIAL ANALYSIS GROUP NAME	MATRIX	SELECTED ANALYSIS NAME
001	0082_MW142	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
002	0082_MW310	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
003	0082_MW311	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
004	0082_QC105	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
005	0082_MW113	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
006	0082_MW115	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
007	0082_MW315	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
008	0082_QC107	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
009	0082_MW143	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

(ALS) COC#: 45122 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - JS

ORDER NO: pfas-omp

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Dishazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

010	0082_MW103D	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
011	0082_MW126	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
012	0082_MW022	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
013	0082_MW118D	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
014	0082_MW154S	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)
015	0082_MW153S	Ground Waters WATER	WATER	- NT-02 Major Anions (Chloride, Sulphate, Alkalinity) - NT-01 Major Cations (Ca, Mg, Na, K) - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G & ED093F - EP231X PFAS - Full Suite (28 analytes)

CHAIN OF CUSTODY

ALS COC#: 45122 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - JS

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0082_MW142	Clear Plastic Bottle - Natural	500 mL	00070522145062	Green	No	
001	0082_MW142	HDPE (no PTFE)	20 mL	00352005019755	Grey	No	
001	0082_MW142	HDPE (no PTFE)	20 mL	00350821001758	Grey	No	
001	0082_MW142	HDPE (no PTFE)	20 mL	00352005019716	Grey	No	
001	0082_MW142	HDPE (no PTFE)	20 mL	00350821001705	Grey	No	
002	0082_MW310	Clear Plastic Bottle - Natural	500 mL	00070522162841	Green	No	
002	0082_MW310	HDPE (no PTFE)	20 mL	00350821001719	Grey	No	
002	0082_MW310	HDPE (no PTFE)	20 mL	00350821001773	Grey	No	
003	0082_MW311	Clear Plastic Bottle - Natural	500 mL	00070522145030	Green	No	
003	0082_MW311	HDPE (no PTFE)	20 mL	00350522042856	Grey	No	
003	0082_MW311	HDPE (no PTFE)	20 mL	00350522043152	Grey	No	
004	0082_QC105	Clear Plastic Bottle - Natural	500 mL	00070522162820	Green	No	
004	0082_QC105	HDPE (no PTFE)	20 mL	00350821001887	Grey	No	
004	0082_QC105	HDPE (no PTFE)	20 mL	00350821001760	Grey	No	
005	0082_MW113	Clear Plastic Bottle - Natural	500 mL	00070522145006	Green	No	
005	0082_MW113	HDPE (no PTFE)	20 mL	00350821001779	Grey	No	
005	0082_MW113	HDPE (no PTFE)	20 mL	00350821001952	Grey	No	
006	0082_MW115	HDPE (no PTFE)	20 mL	00350522043079	Grey	No	
006	0082_MW115	HDPE (no PTFE)	20 mL	00350522042973	Grey	No	
006	0082_MW115	Clear Plastic Bottle - Natural	500 mL	00070522145152	Green	No	
007	0082_MW315	Clear Plastic Bottle - Natural	500 mL	00070522145034	Green	No	
007	0082_MW315	HDPE (no PTFE)	20 mL	00350522043048	Grey	No	
007	0082_MW315	HDPE (no PTFE)	20 mL	00350522043195	Grey	No	
008	0082_QC107	Clear Plastic Bottle - Natural	500 mL	00070522145016	Green	No	
008	0082_QC107	HDPE (no PTFE)	20 mL	00350522043148	Grey	No	
008	0082_QC107	HDPE (no PTFE)	20 mL	00350522042931	Grey	No	

CHAIN OF CUSTODY

COC#: 45122 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - JS

ORDER NO: pfas-om

PROJECT MANAGER

PRIMARY SAMPLER

EMAIL REPORTS TO

EMAIL INVOICES TO

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

009	0082_MW143	HDPE (no PTFE)	20 mL	00350522042807	Grey	No	
009	0082_MW143	HDPE (no PTFE)	20 mL	00350522043051	Grey	No	
009	0082_MW143	Clear Plastic Bottle - Natural	500 mL	00070522145188	Green	No	
010	0082_MW103D	Clear Plastic Bottle - Natural	500 mL	00070522144975	Green	No	
010	0082_MW103D	HDPE (no PTFE)	20 mL	00352005019719	Grey	No	
010	0082_MW103D	HDPE (no PTFE)	20 mL	00350522042774	Grey	No	
010	0082_MW103D	HDPE (no PTFE)	20 mL	00352005019392	Grey	No	
010	0082_MW103D	HDPE (no PTFE)	20 mL	00350522042709	Grey	No	
011	0082_MW126	Clear Plastic Bottle - Natural	500 mL	00070522145170	Green	No	
011	0082_MW126	HDPE (no PTFE)	20 mL	00350522042868	Grey	No	
011	0082_MW126	HDPE (no PTFE)	20 mL	00350522042959	Grey	No	
011	0082_MW126	HDPE (no PTFE)	20 mL	00352005019488	Grey	No	
011	0082_MW126	HDPE (no PTFE)	20 mL	00352005019341	Grey	No	
012	0082_MW022	HDPE (no PTFE)	20 mL	00350522043066	Grey	No	
012	0082_MW022	Clear Plastic Bottle - Natural	500 mL	00070522144967	Green	No	
012	0082_MW022	HDPE (no PTFE)	20 mL	00350522042738	Grey	No	
012	0082_MW022	HDPE (no PTFE)	20 mL	00352005019314	Grey	No	
012	0082_MW022	HDPE (no PTFE)	20 mL	00352005019467	Grey	No	
013	0082_MW118D	HDPE (no PTFE)	20 mL	00350522042937	Grey	No	
013	0082_MW118D	HDPE (no PTFE)	20 mL	00350522062449	Grey	No	
013	0082_MW118D	Clear Plastic Bottle - Natural	500 mL	00070522145139	Green	No	
014	0082_MW154S	HDPE (no PTFE)	20 mL	00352005019697	Grey	No	
014	0082_MW154S	HDPE (no PTFE)	20 mL	00352005019883	Grey	No	
014	0082_MW154S	HDPE (no PTFE)	20 mL	00350522042753	Grey	No	
014	0082_MW154S	HDPE (no PTFE)	20 mL	00350522062450	Grey	No	
014	0082_MW154S	Clear Plastic Bottle - Natural	500 mL	00070522145075	Green	No	
015	0082_MW153S	HDPE (no PTFE)	20 mL	00350522043165	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 45122 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB GW - JS

ORDER NO: pfas-omp HEHB

PROJECT MANAGE[redacted]

PRIMARY SAMPLE[redacted]

EMAIL REPORTS TO[redacted]

EMAIL INVOICES TO[redacted]

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

015	0082_MW153S	HDPE (no PTFE)	20 mL	00350522042861	Grey	No	
015	0082_MW153S	Clear Plastic Bottle - Natural	500 mL	00070522144945	Green	No	

Total Bottle Count: ALS: 55, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2215715**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0082_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp HEHB	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 45122	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: HEHB GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 23-Nov-2022 11:30	Issue Date	: 30-Nov-2022
Client Requested Due Date	: 06-Dec-2022	Scheduled Reporting Date	: **05-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 21.2 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 15 / 15

General Comments

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

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 Major Cations (Ca, Mg, Na, K)	WATER - NT-02 Major Anions (Chloride, Sulphate, Alkalinity)
EP2215715-001	21-Nov-2022 09:56	0082_MW142_221121	✓	✓	✓	✓
EP2215715-002	21-Nov-2022 10:25	0082_MW310_221121	✓	✓	✓	✓
EP2215715-003	21-Nov-2022 10:40	0082_MW311_221121	✓	✓	✓	✓
EP2215715-004	21-Nov-2022 10:43	0082_QC105_221121	✓	✓	✓	✓
EP2215715-005	21-Nov-2022 11:09	0082_MW113_221121	✓	✓	✓	✓
EP2215715-006	21-Nov-2022 11:27	0082_MW115_221121	✓	✓	✓	✓
EP2215715-007	21-Nov-2022 11:47	0082_MW315_221121	✓	✓	✓	✓
EP2215715-008	21-Nov-2022 11:48	0082_QC107_221121	✓	✓	✓	✓
EP2215715-009	21-Nov-2022 12:08	0082_MW143_221121	✓	✓	✓	✓
EP2215715-010	21-Nov-2022 12:25	0082_MW103D_221121	✓	✓	✓	✓
EP2215715-011	21-Nov-2022 12:42	0082_MW126_221121	✓	✓	✓	✓
EP2215715-012	21-Nov-2022 12:59	0082_MW022_221121	✓	✓	✓	✓
EP2215715-014	21-Nov-2022 13:58	0082_MW154S_221121	✓	✓	✓	✓
EP2215715-015	21-Nov-2022 14:19	0082_MW153S_221121	✓	✓	✓	✓
EP2215715-016	21-Nov-2022 14:19	0082_MW118D_221121	✓	✓	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]stantec.com

DERP LAB REPORTS
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au

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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2215715**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022 11:30
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 28-Nov-2022
C-O-C number	: 45122	Issue Date	: 06-Dec-2022 23:31
Sampler	: [redacted]		
Site	: HEHB GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

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

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0082_MW142_221121	0082_MW310_221121	0082_MW311_221121	0082_QC105_221121	0082_MW113_221121
				Sampling date / time	21-Nov-2022 09:56	21-Nov-2022 10:25	21-Nov-2022 10:40	21-Nov-2022 10:43	21-Nov-2022 11:09
					EP2215715-001	EP2215715-002	EP2215715-003	EP2215715-004	EP2215715-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**361**	**660**	**169**	**166**	**613**
Total Alkalinity as CaCO3	----	1	mg/L		**361**	**660**	**169**	**166**	**613**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**199**	**278**	**5**	**5**	**176**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**1410**	**489**	**16**	**16**	**644**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**168**	**24**	**12**	**12**	**18**
Magnesium	7439-95-4	1	mg/L		**138**	**41**	**7**	**7**	**24**
Sodium	7440-23-5	1	mg/L		**778**	**574**	**44**	**44**	**602**
Potassium	7440-09-7	1	mg/L		**59**	**48**	**13**	**13**	**41**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**51.1**	**32.8**	**3.93**	**3.87**	**34.1**
ø Total Cations	----	0.01	meq/L		**55.1**	**30.8**	**3.42**	**3.42**	**30.1**
ø Ionic Balance	----	0.01	%		**3.73**	**3.15**	**6.95**	**6.18**	**6.19**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.16**	**4.25**	<0.02	<0.02	**0.02**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.14**	**6.58**	<0.02	<0.02	**0.02**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.34**	**27.3**	**0.17**	**0.19**	**0.20**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.27**	**0.46**	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**21.5**	**4.15**	**0.32**	**0.33**	**0.08**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.7**	**3.8**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**1.36**	**11.5**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**1.07**	**23.0**	**0.02**	**0.02**	**0.03**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.47**	**3.29**	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW142_221121	0082_MW310_221121	0082_MW311_221121	0082_QC105_221121	0082_MW113_221121
				Sampling date / time	21-Nov-2022 09:56	21-Nov-2022 10:25	21-Nov-2022 10:40	21-Nov-2022 10:43	21-Nov-2022 11:09
Compound	CAS Number	LOR	Unit		EP2215715-001	EP2215715-002	EP2215715-003	EP2215715-004	EP2215715-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.36**	**0.54**	**0.02**	**0.02**	**0.01**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.09**	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**4.00**	**0.64**	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW142_221121	0082_MW310_221121	0082_MW311_221121	0082_QC105_221121	0082_MW113_221121
				Sampling date / time	21-Nov-2022 09:56	21-Nov-2022 10:25	21-Nov-2022 10:40	21-Nov-2022 10:43	21-Nov-2022 11:09
Compound	CAS Number	LOR	Unit		EP2215715-001	EP2215715-002	EP2215715-003	EP2215715-004	EP2215715-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**31.5**	**85.5**	**0.53**	**0.56**	**0.36**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**22.8**	**31.4**	**0.49**	**0.52**	**0.28**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**31.0**	**78.5**	**0.53**	**0.56**	**0.34**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**101**	**99.0**	**101**	**98.9**
13C8-PFOA	----	0.02	%		**103**	**104**	**98.4**	**104**	**105**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0082_MW115_221121	0082_MW315_221121	0082_QC107_221121	0082_MW143_221121	0082_MW103D_221121
				Sampling date / time	21-Nov-2022 11:27	21-Nov-2022 11:47	21-Nov-2022 11:48	21-Nov-2022 12:08	21-Nov-2022 12:25
					EP2215715-006	EP2215715-007	EP2215715-008	EP2215715-009	EP2215715-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	**41**	**37**	**4**	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**389**	**721**	**735**	**398**	**177**
Total Alkalinity as CaCO3	----	1	mg/L		**389**	**762**	**772**	**402**	**177**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**343**	**12**	**8**	**20**	**159**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**942**	**41**	**42**	**58**	**1260**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**76**	**1**	**1**	**10**	**210**
Magnesium	7439-95-4	1	mg/L		**86**	**2**	**2**	**8**	**122**
Sodium	7440-23-5	1	mg/L		**654**	**305**	**303**	**150**	**540**
Potassium	7440-09-7	1	mg/L		**70**	**22**	**22**	**30**	**24**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**41.5**	**16.6**	**16.8**	**10.1**	**42.4**
ø Total Cations	----	0.01	meq/L		**41.1**	**14.0**	**14.0**	**8.45**	**44.6**
ø Ionic Balance	----	0.01	%		**0.46**	**8.43**	**9.17**	**8.82**	**2.56**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.22**	<0.02	<0.02	**0.02**	**0.27**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.41**	<0.02	<0.02	**0.04**	**0.39**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**4.91**	<0.01	<0.01	**0.45**	**2.89**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.29**	<0.02	<0.02	**0.10**	**0.14**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**14.6**	<0.01	<0.01	**6.73**	**3.03**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**1.4**	<0.1	<0.1	**0.6**	**0.1**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**3.46**	<0.02	<0.02	**1.14**	**0.31**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**3.16**	<0.02	<0.02	**1.06**	**0.76**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW115_221121	0082_MW315_221121	0082_QC107_221121	0082_MW143_221121	0082_MW103D_221121
				Sampling date / time	21-Nov-2022 11:27	21-Nov-2022 11:47	21-Nov-2022 11:48	21-Nov-2022 12:08	21-Nov-2022 12:25
Compound	CAS Number	LOR	Unit		EP2215715-006	EP2215715-007	EP2215715-008	EP2215715-009	EP2215715-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**1.49**	<0.02	<0.02	**0.88**	**0.10**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.70**	<0.01	<0.01	**0.76**	**0.09**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.06**	<0.02	<0.02	**0.04**	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**6.15**	<0.05	<0.05	**1.32**	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW115_221121	0082_MW315_221121	0082_QC107_221121	0082_MW143_221121	0082_MW103D_221121
				Sampling date / time	21-Nov-2022 11:27	21-Nov-2022 11:47	21-Nov-2022 11:48	21-Nov-2022 12:08	21-Nov-2022 12:25
Compound	CAS Number	LOR	Unit		EP2215715-006	EP2215715-007	EP2215715-008	EP2215715-009	EP2215715-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**36.8**	<0.01	<0.01	**13.1**	**8.08**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**19.5**	<0.01	<0.01	**7.18**	**5.92**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**36.1**	<0.01	<0.01	**13.0**	**7.55**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.5**	**92.8**	**98.2**	**102**	**93.9**
13C8-PFOA	----	0.02	%		**98.8**	**97.8**	**102**	**102**	**102**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW126_221121	0082_MW022_221121	0082_MW154S_221121	0082_MW153S_221121	0082_MW118D_221121
				Sampling date / time	21-Nov-2022 12:42	21-Nov-2022 12:59	21-Nov-2022 13:58	21-Nov-2022 14:19	21-Nov-2022 14:19
Compound	CAS Number	LOR	Unit		EP2215715-011	EP2215715-012	EP2215715-014	EP2215715-015	EP2215715-016
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	**14**
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**209**	**311**	**518**	**327**	**532**
Total Alkalinity as CaCO3	----	1	mg/L		**209**	**311**	**518**	**327**	**546**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**52**	**14**	**1500**	**2110**	**141**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**111**	**14**	**8790**	**15000**	**906**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**34**	**38**	**347**	**495**	**16**
Magnesium	7439-95-4	1	mg/L		**20**	**27**	**638**	**1080**	**26**
Sodium	7440-23-5	1	mg/L		**93**	**34**	**5460**	**8830**	**800**
Potassium	7440-09-7	1	mg/L		**17**	**17**	**250**	**466**	**55**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**8.39**	**6.90**	**290**	**474**	**39.4**
ø Total Cations	----	0.01	meq/L		**7.82**	**6.03**	**314**	**510**	**39.1**
ø Ionic Balance	----	0.01	%		**3.50**	**6.71**	**4.01**	**3.66**	**0.33**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	**0.21**	<0.02	**0.30**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.02**	**0.25**	<0.02	**0.36**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.18**	**0.36**	**1.15**	<0.01	**2.08**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.02**	**0.06**	<0.02	**0.33**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.34**	**2.39**	**0.85**	<0.01	**10.9**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.3**	<0.1	<0.1	<0.1	**0.4**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.90**	**0.12**	**0.26**	<0.02	**0.87**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.82**	**0.12**	**0.28**	<0.02	**1.12**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW126_221121	0082_MW022_221121	0082_MW154S_221121	0082_MW153S_221121	0082_MW118D_221121
				Sampling date / time	21-Nov-2022 12:42	21-Nov-2022 12:59	21-Nov-2022 13:58	21-Nov-2022 14:19	21-Nov-2022 14:19
Compound	CAS Number	LOR	Unit		EP2215715-011	EP2215715-012	EP2215715-014	EP2215715-015	EP2215715-016
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.23**	**0.17**	**0.11**	<0.02	**0.40**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.08**	**0.18**	**0.08**	<0.01	**0.70**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.02**	**0.24**	<0.02	<0.02	**0.14**
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	**4.05**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	**0.13**

Analytical Results

Sub-Matrix: **GROUNDWATER** (Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	0082_MW126_221121	0082_MW022_221121	0082_MW154S_221121	0082_MW153S_221121	0082_MW118D_221121
				Sampling date / time	21-Nov-2022 12:42	21-Nov-2022 12:59	21-Nov-2022 13:58	21-Nov-2022 14:19	21-Nov-2022 14:19
					EP2215715-011	EP2215715-012	EP2215715-014	EP2215715-015	EP2215715-016
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**2.87**	**3.62**	**3.25**	<0.01	**21.8**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.52**	**2.75**	**2.00**	<0.01	**13.0**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**2.85**	**3.34**	**2.94**	<0.01	**21.0**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.4**	**92.3**	**94.8**	**91.7**	**95.7**
13C8-PFOA	----	0.02	%		**93.4**	**91.6**	**97.0**	**90.8**	**104**

Surrogate Control Limits

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

Inter-Laboratory Testing

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

(WATER) EP231A: Perfluoroalkyl Sulfonic Acids

(WATER) EP231B: Perfluoroalkyl Carboxylic Acids

(WATER) EP231C: Perfluoroalkyl Sulfonamides

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

(WATER) EP231P: PFAS Sums

(WATER) EP231S: PFAS Surrogate

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2215715**	Page	: 1 of 14
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 28-Nov-2022
C-O-C number	: 45122	Issue Date	: 06-Dec-2022
Sampler	: [redacted]		
Site	: HEHB GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 15		
No. of samples analysed	: 15		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 4739024)									
EP2215643-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	156	160	2.6	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	156	160	2.6	0% - 20%
EP2215715-007	0082_MW315_221121	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	41	40	4.0	0% - 20%
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	721	724	0.5	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	762	764	0.2	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4731519)									
EP2215710-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	928	913	1.6	0% - 20%
EP2215710-012	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1880	1860	0.9	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4736343)									
EP2215715-009	0082_MW143_221121	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	20	19	0.0	0% - 50%
EP2215791-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2660	2640	0.6	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 4750049)									
EP2215715-016	0082_MW118D_221121	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	141	141	0.0	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4731518)									
EP2215710-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	930	927	0.4	0% - 20%
EP2215710-012	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	13200	13200	0.2	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4736342)									
EP2215715-009	0082_MW143_221121	ED045G: Chloride	16887-00-6	1	mg/L	58	59	2.0	0% - 20%
EP2215791-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17100	17400	1.7	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 4750048)									

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED045G: Chloride by Discrete Analyser (QC Lot: 4750048) - continued									
EP2215715-016	0082_MW118D_221121	ED045G: Chloride	16887-00-6	1	mg/L	906	907	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4731252)									
EP2215643-017	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	462	466	0.8	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	778	785	0.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	6430	6510	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	283	287	1.4	0% - 20%
EP2215715-004	0082_QC105_221121	ED093F: Calcium	7440-70-2	1	mg/L	12	12	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	7	7	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	44	43	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	13	13	0.0	0% - 50%
ED093F: Dissolved Major Cations (QC Lot: 4731255)									
EP2215715-015	0082_MW153S_221121	ED093F: Calcium	7440-70-2	1	mg/L	495	490	1.1	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1080	1070	0.8	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	8830	8770	0.7	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	466	460	1.4	0% - 20%
EP2215722-010	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	581	593	2.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1350	1380	2.1	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	10800	10900	1.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	653	668	2.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 4738821)									
EP2215715-016	0082_MW118D_221121	ED093F: Calcium	7440-70-2	1	mg/L	16	15	0.0	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	26	26	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	800	788	1.5	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	55	54	2.1	0% - 20%
EP2215848-008	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	246	246	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	412	413	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	3010	3000	0.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	155	155	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4739022)									
EP2215641-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2215715-010	0082_MW103D_221121	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	2.89	2.80	3.4	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	3.03	3.08	1.5	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.27	0.25	6.5	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.39	0.38	3.4	0% - 50%

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4739022) - continued									
EP2215715-010	0082_MW103D_221121	EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.14	0.14	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4739533)									
EP2215715-011	0082_MW126_221121	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.18	0.16	11.1	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.34	0.31	9.1	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2215722-009	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4739022)									
EP2215641-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2215715-010	0082_MW103D_221121	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.09	0.08	11.8	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.31	0.30	4.2	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.76	0.76	0.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.10	0.09	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.1	0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4739533)									
EP2215715-011	0082_MW126_221121	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.08	0.08	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4739533) - continued									
EP2215715-011	0082_MW126_221121	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.90	0.82	9.5	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.82	0.77	6.1	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.23	0.21	9.0	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	0.3	0.3	0.0	No Limit
EP2215722-009	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4739022)									
EP2215641-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2215715-010	0082_MW103D_221121	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4739022) - continued									
EP2215715-010	0082_MW103D_221121	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4739533)									
EP2215715-011	0082_MW126_221121	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2215722-009	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4739022)									
EP2215641-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4739022) - continued									
EP2215641-003	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2215715-010	0082_MW103D_221121	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4739533)									
EP2215715-011	0082_MW126_221121	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2215722-009	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4739022)									
EP2215641-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2215715-010	0082_MW103D_221121	EP231X: Sum of PFAS	----	0.01	µg/L	8.08	7.98	1.2	0% - 20%
EP231P: PFAS Sums (QC Lot: 4739533)									
EP2215715-011	0082_MW126_221121	EP231X: Sum of PFAS	----	0.01	µg/L	2.87	2.67	7.2	0% - 20%
EP2215722-009	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 4739024)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	110	87.8	118
				<1	200 mg/L	99.8	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4731519)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.7	89.9	112
				<1	500 mg/L	97.6	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4736343)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	107	89.9	112
				<1	500 mg/L	106	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4750049)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.4	89.9	112
				<1	500 mg/L	98.4	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 4731518)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	89.1	88.6	113
				<1	1000 mg/L	93.7	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 4736342)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	93.3	88.6	113
				<1	1000 mg/L	98.2	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 4750048)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	89.2	88.6	113
				<1	1000 mg/L	94.2	88.6	113
ED093F: Dissolved Major Cations (QCLot: 4731252)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.4	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.2	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.7	84.6	108
ED093F: Dissolved Major Cations (QCLot: 4731255)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	99.1	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.1	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	106	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	97.5	84.6	108

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 4738821)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	97.6	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	95.5	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	102	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	91.8	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4739022)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	84.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	102	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	92.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	102	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	107	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4739533)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	77.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	95.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	84.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	89.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	81.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	78.2	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4744453)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	92.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	115	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	109	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	117	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	107	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	117	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4739022)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	100	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	92.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	95.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	92.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	91.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	98.6	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4739533)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4739533) - continued								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	90.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	84.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	75.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	78.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	95.8	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4744453)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	112	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	109	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	115	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	115	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	127	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4739022)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	93.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	96.7	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.2	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	97.7	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	89.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4739533)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	106	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	92.7	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	87.9	62.6	147

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4739533) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	91.4	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	108	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	105	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	101	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4744453)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	110	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	107	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	96.6	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	107	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	118	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	118	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	107	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4739022)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	98.0	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	108	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	102	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	96.6	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4739533)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	80.8	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	85.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	96.8	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	88.8	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4744453)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	110	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	116	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	105	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	91.2	71.4	144

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4731519)							
EP2215710-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4736343)							
EP2215715-009	0082_MW143_221121	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	116	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 4750049)							
EP2215715-016	0082_MW118D_221121	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	110	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 4731518)							
EP2215710-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	95.1	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4736342)							
EP2215715-009	0082_MW143_221121	ED045G: Chloride	16887-00-6	1000 mg/L	90.7	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 4750048)							
EP2215715-016	0082_MW118D_221121	ED045G: Chloride	16887-00-6	1000 mg/L	70.6	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4739022)							
EP2215715-001	0082_MW142_221121	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	94.2	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	106	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	# Not Determined	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	126	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	122	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4739533)							
EP2215715-012	0082_MW022_221121	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	88.4	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	109	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	125	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	104	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	101	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4739022)							
EP2215715-001	0082_MW142_221121	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	128	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	# Not Determined	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	# Not Determined	72.0	129

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4739022) - continued							
EP2215715-001	0082_MW142_221121	EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	112	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	108	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	125	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	119	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	111	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	113	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	112	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	123	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4739533)							
EP2215715-012	0082_MW022_221121	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	115	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	123	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	122	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	118	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	103	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	97.6	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	91.8	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	109	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	124	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	89.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	119	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4739022)							
EP2215715-001	0082_MW142_221121	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	115	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	118	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	123	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	120	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	126	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	125	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	112	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4739533)							
EP2215715-012	0082_MW022_221121	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	127	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	120	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	122	62.6	147

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4739533) - continued							
EP2215715-012	0082_MW022_221121	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	136	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	126	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	124	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	113	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4739022)							
EP2215715-001	0082_MW142_221121	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	120	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	# Not Determined	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	121	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	113	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4739533)							
EP2215715-012	0082_MW022_221121	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	103	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	106	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	122	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	106	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2215715**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022
Site	: HEHB GW - JS	Issue Date	: 06-Dec-2022
Sampler	: [redacted]	No. of samples received	: 15
Order number	: pfas-omp HEHB	No. of samples analysed	: 15

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2215710--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2215715--001	0082_MW142_221121	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2215715--001	0082_MW142_221121	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EP2215715--012	0082_MW022_221121	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2215715--001	0082_MW142_221121	**Perfluoropentanoic acid (PFPeA)**	2706-90-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EP2215715--001	0082_MW142_221121	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EP2215715--001	0082_MW142_221121	**6:2 Fluorotelomer sulfonic acid (6:2 FTS)**	27619-97-2	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations						
Clear Plastic Bottle - Natural						
0082_MW118D_221121	----	----	----	30-Nov-2022	28-Nov-2022	**2**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	4	57	7.02	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	57	3.51	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0082_MW142_221121, 0082_MW310_221121, 0082_MW311_221121, 0082_QC105_221121, 0082_MW113_221121, 0082_MW115_221121, 0082_MW315_221121, 0082_QC107_221121, 0082_MW143_221121, 0082_MW103D_221121, 0082_MW126_221121, 0082_MW022_221121, 0082_MW154S_221121, 0082_MW153S_221121, 0082_MW118D_221121	**21-Nov-2022**	**----**	----	----	**01-Dec-2022**	05-Dec-2022	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0082_MW142_221121, 0082_MW310_221121, 0082_MW311_221121, 0082_QC105_221121, 0082_MW113_221121, 0082_MW115_221121, 0082_MW315_221121, 0082_QC107_221121, 0082_MW143_221121, 0082_MW103D_221121, 0082_MW126_221121, 0082_MW022_221121, 0082_MW154S_221121, 0082_MW153S_221121, 0082_MW118D_221121	**21-Nov-2022**	**----**	----	----	**06-Dec-2022**	19-Dec-2022	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0082_MW142_221121, 0082_MW310_221121, 0082_MW311_221121, 0082_QC105_221121, 0082_MW113_221121, 0082_MW115_221121, 0082_MW315_221121, 0082_QC107_221121, 0082_MW143_221121, 0082_MW103D_221121, 0082_MW126_221121, 0082_MW022_221121, 0082_MW154S_221121, 0082_MW153S_221121, 0082_MW118D_221121	**21-Nov-2022**	**----**	----	----	**06-Dec-2022**	19-Dec-2022	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0082_MW142_221121, 0082_MW310_221121, 0082_MW311_221121, 0082_QC105_221121, 0082_MW113_221121, 0082_MW115_221121, 0082_MW315_221121, 0082_QC107_221121, 0082_MW143_221121, 0082_MW103D_221121, 0082_MW126_221121, 0082_MW022_221121, 0082_MW154S_221121, 0082_MW153S_221121	**21-Nov-2022**	**----**	----	----	**28-Nov-2022**	28-Nov-2022	✓
Clear Plastic Bottle - Natural (ED093F)							
0082_MW118D_221121	**21-Nov-2022**	**----**	----	----	**30-Nov-2022**	28-Nov-2022	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0082_MW142_221121, 0082_MW310_221121, 0082_MW311_221121, 0082_QC105_221121, 0082_MW113_221121, 0082_MW115_221121, 0082_MW315_221121, 0082_QC107_221121, 0082_MW143_221121, 0082_MW103D_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**01-Dec-2022**	20-May-2023	✓
HDPE (no PTFE) (EP231X)							
0082_MW126_221121, 0082_MW022_221121, 0082_MW154S_221121, 0082_MW153S_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**05-Dec-2022**	20-May-2023	✓
HDPE (no PTFE) (EP231X)							
0082_MW118D_221121	**21-Nov-2022**	**03-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	20-May-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0082_MW142_221121, 0082_MW310_221121, 0082_MW311_221121, 0082_QC105_221121, 0082_MW113_221121, 0082_MW115_221121, 0082_MW315_221121, 0082_QC107_221121, 0082_MW143_221121, 0082_MW103D_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**01-Dec-2022**	20-May-2023	✓
HDPE (no PTFE) (EP231X)							
0082_MW126_221121, 0082_MW022_221121, 0082_MW154S_221121, 0082_MW153S_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**05-Dec-2022**	20-May-2023	✓
HDPE (no PTFE) (EP231X)							
0082_MW118D_221121	**21-Nov-2022**	**03-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	20-May-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0082_MW142_221121, 0082_MW310_221121, 0082_MW311_221121, 0082_QC105_221121, 0082_MW113_221121, 0082_MW115_221121, 0082_MW315_221121, 0082_QC107_221121, 0082_MW143_221121, 0082_MW103D_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**01-Dec-2022**	20-May-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW126_221121, 0082_MW022_221121, 0082_MW154S_221121, 0082_MW153S_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**05-Dec-2022**	20-May-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW118D_221121	**21-Nov-2022**	**03-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	20-May-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0082_MW142_221121, 0082_MW310_221121, 0082_MW311_221121, 0082_QC105_221121, 0082_MW113_221121, 0082_MW115_221121, 0082_MW315_221121, 0082_QC107_221121, 0082_MW143_221121, 0082_MW103D_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**01-Dec-2022**	20-May-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW126_221121, 0082_MW022_221121, 0082_MW154S_221121, 0082_MW153S_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**05-Dec-2022**	20-May-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW118D_221121	**21-Nov-2022**	**03-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	20-May-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0082_MW142_221121, 0082_MW310_221121, 0082_MW311_221121, 0082_QC105_221121, 0082_MW113_221121, 0082_MW115_221121, 0082_MW315_221121, 0082_QC107_221121, 0082_MW143_221121, 0082_MW103D_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**01-Dec-2022**	20-May-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW126_221121, 0082_MW022_221121, 0082_MW154S_221121, 0082_MW153S_221121	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**05-Dec-2022**	20-May-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW118D_221121	**21-Nov-2022**	**03-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	20-May-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	5	41	**12.20**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	6	51	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	57	**7.02**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	5	38	**13.16**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	6	41	**14.63**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	51	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	57	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	6	38	**15.79**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	3	41	**7.32**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	51	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	57	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	38	**7.89**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	3	41	**7.32**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	57	**3.51**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	3	38	**7.89**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

ALSCompass
SAMPLING Intelligence

ALS

Environmental Division
Perth
Work Order Reference
EP2215716

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA_0082-PFASOMP **Client:** STANTEC **Project Manager:** Mzella BOURDAIS

Phone: ( )

ALS Compass COC Reference: 45066 45122 45142 45067 45069 **# Samples:** **Sampler:** HB JS

Phone: ( )

Turnaround Requirements: Standard ✓ Urgent

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC			
Date / Time: 22/11/20	Date / Time: 23/11 1130	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 45142 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB SD - JS

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0082_SD164		21/11/2022 01:05 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0082_QC108		21/11/2022 01:07 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0082_SS165		21/11/2022 01:18 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 45142 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP

SITE: HEHB SD - JS

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0082_SD164	HDPE Soil Jar	200 mL	00620322054846	Grey	No	
002	0082_QC108	HDPE Soil Jar	200 mL	00620322054993	Grey	No	
003	0082_SS165	HDPE Soil Jar	200 mL	00620322054962	Grey	No	

Total Bottle Count: ALS: 3, Non ALS: 0

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2215716**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: [redacted]alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0082_PFASOMP	Page	: 1 of 2
Order number	: pfas-omp HEHB	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 45142	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: HEHB SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 23-Nov-2022 11:30	Issue Date	: 28-Nov-2022
Client Requested Due Date	: 06-Dec-2022	Scheduled Reporting Date	: **06-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 21.2 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

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

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2215716-001	21-Nov-2022 13:05	0082_SD164_221121	✓	✓
EP2215716-002	21-Nov-2022 13:07	0082_QC108_221121	✓	✓
EP2215716-003	21-Nov-2022 13:18	0082_SS165_221121	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted] [redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]stantec.com
DERP LAB REPORTS		
- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au
[redacted] [redacted] **(STANTEC)**		
- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]stantec.com
- Chain of Custody (CoC) (COC)	Email	[redacted]stantec.com
- EDI Format - ESDAT (ESDAT)	Email	[redacted]stantec.com
- EDI Format - XTab (XTAB)	Email	[redacted]stantec.com

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2215716**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022 11:30
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 01-Dec-2022
C-O-C number	: 45142	Issue Date	: 06-Dec-2022 09:11
Sampler	: [redacted]		
Site	: HEHB SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Franco Lentini	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- PFAS conducted by ALS Sydney, NATA accreditation no. 825, site no 10911.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0082_SD164_221121	0082_QC108_221121	0082_SS165_221121	----	----
			Sampling date / time	21-Nov-2022 13:05	21-Nov-2022 13:07	21-Nov-2022 13:18	----	----
Compound	CAS Number	LOR	Unit	EP2215716-001	EP2215716-002	EP2215716-003	--------	--------
				Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**0.2**	<0.1	<0.1	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	**0.0002**	<0.0002	<0.0002	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	**0.0007**	**0.0003**	**0.0012**	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	----	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0082_SD164_221121	0082_QC108_221121	0082_SS165_221121	----	----
				Sampling date / time	21-Nov-2022 13:05	21-Nov-2022 13:07	21-Nov-2022 13:18	----	----
Compound	CAS Number	LOR	Unit		EP2215716-001	EP2215716-002	EP2215716-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0009**	**0.0003**	**0.0012**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0009**	**0.0003**	**0.0012**	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0009**	**0.0003**	**0.0012**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**97.5**	**100**	**104**	----	----
13C8-PFOA	----	0.0002	%		**92.5**	**95.0**	**98.0**	----	----

Surrogate Control Limits

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

Inter-Laboratory Testing

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

(SOIL) EP231B: Perfluoroalkyl Carboxylic Acids

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

(SOIL) EP231C: Perfluoroalkyl Sulfonamides

(SOIL) EP231A: Perfluoroalkyl Sulfonic Acids

(SOIL) EP231P: PFAS Sums

(SOIL) EP231S: PFAS Surrogate

(SOIL) EA055: Moisture Content (Dried @ 105-110°C)

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2215716**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Contact	: [redacted]
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 01-Dec-2022
C-O-C number	: 45142	Issue Date	: 06-Dec-2022
Sampler	: [redacted]		
Site	: HEHB SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Franco Lentini	LCMS Coordinator	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4746709)									
EB2235225-013	Anonymous	EA055: Moisture Content	----	0.1	%	60.1	51.8	14.8	0% - 20%
ES2243170-001	Anonymous	EA055: Moisture Content	----	0.1	%	8.1	8.4	4.5	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4740744)									
EB2235225-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0014	0.0014	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2215642-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4740744)									
EB2235225-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0002	0.0003	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4740744) - continued									
EB2235225-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2215642-005	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4740744)									
EB2235225-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2215642-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4740744)									
EB2235225-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2215642-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4740744)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4740744)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4740744)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	119	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	112	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4740744)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	102	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	88.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	88.4	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4740744) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	95.2	69.2	143

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4740744)							
EB2235225-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	84.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	95.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	105	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	93.6	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	88.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	99.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4740744)							
EB2235225-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	87.4	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	115	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	120	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	106	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	107	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	109	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	101	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	123	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	113	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	115	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	115	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4740744)							
EB2235225-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	118	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	109	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	116	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	84.1	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	103	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	126	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4740744) - continued							
EB2235225-001	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	117	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4740744)							
EB2235225-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	92.4	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	96.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	104	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	84.0	69.2	143

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2215716**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted] (STANTEC)	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP	Date Samples Received	: 23-Nov-2022
Site	: HEHB SD - JS	Issue Date	: 06-Dec-2022
Sampler	: [redacted]	No. of samples received	: 3
Order number	: pfas-omp HEHB	No. of samples analysed	: 3

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)								
HDPE Soil Jar (EA055)								
0082_SD164_221121, 0082_SS165_221121	0082_QC108_221121,	**21-Nov-2022**	**----**	----	----	**05-Dec-2022**	05-Dec-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0082_SD164_221121, 0082_SS165_221121	0082_QC108_221121,	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
0082_SD164_221121, 0082_SS165_221121	0082_QC108_221121,	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
0082_SD164_221121, 0082_SS165_221121	0082_QC108_221121,	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
0082_SD164_221121, 0082_SS165_221121	0082_QC108_221121,	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
0082_SD164_221121, 0082_SS165_221121	0082_QC108_221121,	**21-Nov-2022**	**01-Dec-2022**	20-May-2023	✓	**06-Dec-2022**	10-Jan-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

604979

eurofins | mgt

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CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Stantec Australia	Contact Name : [redacted]	Purchase Order : PFAS-OMP 304700525	COC Number : AS-OMP 304700525 -01
Office Address : 226 Adelaide Tce, Perth, WA, 6000		PROJECT Number : WA_0082_PFASOMP	Eurofins | mgt quote ID : NA
	[redacted]	PROJECT Name : WA_0082_PFASOMP	Data output format: PDF; ESDAT

Special Directions & Comments :
Please send ESdat files to derp.labreports@esdat.com.au with the project No in the header file

Please send email invoice to claire.armstrong@stantec.com; SAPinvoices@stantec.com

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	Analytes: PFAS (28 analytes)	Containers: 1LP	250P	125P	1LA	40mL vial	125mL A	Jar		Sample comments:
1	0082_QC201_221120	20/11/2022	Soil	X									
2	0082_QC202_220620	20/11/2022	Water	X									
3	0082_QC203_220620	20/11/2022	Water	X									
4	0082_QC204_221121	21/11/2022	Water	X									
5	0082_QC205_221121	21/11/2022	Water	X									
6	0082_QC206_221121	21/11/2022	Water	X									
7	0082_QC207_221121	21/11/2022	Water	X									
8	0082_QC208_221121	21/11/2022	Soil	X									
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													

Some common holding times (with correct preservation). For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Relinquished By: Stantec

Date & Time : 24/06/2022

Signature:

Laboratory Staff: [redacted]

Turn around time

1 DAY ☐ 2 DAY ☐ 3 DAY ☐

STANDARD ☑ Other:

Method Of Shipment

☑ Courier
☐ Hand Delivered
☐ Postal

Courier Consignment # : 00903KBJ52

Temperature on arrival: 20.3

Report number: 945158

www.eurofins.com.au EnviroSales@eurofins.com

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Sample Receipt Advice

Company name:	Stantec Australia Pty Ltd (WA)
Contact name:	[redacted]
Project name:	WA_0082_PFASOMP
Project ID:	WA_0082_PFASOMP
Turnaround time:	5 Day
Date/Time received	Nov 28, 2022 10:25 AM
Eurofins reference	945158

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✗	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

We have received an extra sample: 0082_MW118D. Please advise.

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[redacted] **on phone : or by email:** [redacted]**eurofins.com**

Results will be delivered electronically via email to [redacted] - [redacted]stantec.com.

Note: A copy of these results will also be delivered to the general Stantec Australia Pty Ltd (WA) email address.

Global Leader - Results you can trust

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email: EnviroSales@eurofins.com

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0082_PFASOMP
Project ID: WA_0082_PFASOMP

Order No.: PFAS-OMP 304700525
Report #: 945158
Phone: 0458 839 200
Fax:

Received: Nov 28, 2022 10:25 AM
Due: Dec 5, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0082_QC201_221120	Nov 20, 2022		Soil	L22-No0066908	X	X
2	0082_QC202_221120	Nov 20, 2022		Water	L22-No0066909		X
3	0082_QC203_221120	Nov 20, 2022		Water	L22-No0066910		X
4	0082_QC204_221120	Nov 21, 2022		Water	L22-No0066911		X
5	0082_QC205_221120	Nov 21, 2022		Water	L22-No0066912		X
6	0082_QC206_221120	Nov 21, 2022		Water	L22-No0066913		X
7	0082_QC207_221120	Nov 21, 2022		Water	L22-No0066914		X
8	0082_QC208_221120	Nov 21, 2022		Soil	L22-No0066915	X	X

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0082_PFASOMP
Project ID: WA_0082_PFASOMP

Order No.: PFAS-OMP 304700525
Report #: 945158
Phone: 0458 839 200
Fax:

Received: Nov 28, 2022 10:25 AM
Due: Dec 5, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0082_MW118 D	Not Provided		Water	L22-No0066916		X
Test Counts						2	9

Stantec Australia Pty Limited
6F 226,Adelaide Terrace
Perth
WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **945158-S**
Project name WA_0082_PFASOMP
Project ID WA_0082_PFASOMP
Received Date Nov 28, 2022

Client Sample ID			**0082_QC201_221120**	**0082_QC208_221120**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**L22-No0066908**	**L22-No0066915**
Date Sampled			**Nov 20, 2022**	**Nov 21, 2022**
Test/Reference	LOR	Unit		
% Moisture	1	%	41	< 1
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5
13C4-PFBA (surr.)	1	%	16	71
13C5-PFPeA (surr.)	1	%	27	92
13C5-PFHxA (surr.)	1	%	44	87
13C4-PFHpA (surr.)	1	%	35	61
13C8-PFOA (surr.)	1	%	39	59
13C5-PFNA (surr.)	1	%	52	69
13C6-PFDA (surr.)	1	%	57	67
13C2-PFUnDA (surr.)	1	%	57	73
13C2-PFDoDA (surr.)	1	%	53	86
13C2-PFTeDA (surr.)	1	%	52	84
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10

Client Sample ID			0082_QC201_221120	0082_QC208_221120
Sample Matrix			Soil	Soil
Eurofins Sample No.			L22-No0066908	L22-No0066915
Date Sampled			Nov 20, 2022	Nov 21, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonamido substances				
13C8-FOSA (surr.)	1	%	76	72
D3-N-MeFOSA (surr.)	1	%	76	108
D5-N-EtFOSA (surr.)	1	%	90	104
D7-N-MeFOSE (surr.)	1	%	58	86
D9-N-EtFOSE (surr.)	1	%	54	101
D5-N-EtFOSAA (surr.)	1	%	52	44
D3-N-MeFOSAA (surr.)	1	%	46	74
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5
13C3-PFBS (surr.)	1	%	53	81
18O2-PFHxS (surr.)	1	%	55	59
13C8-PFOS (surr.)	1	%	81	62
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	29	106
13C2-6:2 FTSA (surr.)	1	%	36	76
13C2-8:2 FTSA (surr.)	1	%	63	63
13C2-10:2 FTSA (surr.)	1	%	91	94
PFASs Summations				
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Nov 28, 2022	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Nov 30, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Nov 30, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Nov 30, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Nov 30, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Nov 28, 2022	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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WA 6000

Project Name: WA_0082_PFASOMP
Project ID: WA_0082_PFASOMP

Order No.: PFAS-OMP 304700525
Report #: 945158
Phone: 0458 839 200
Fax:

Received: Nov 28, 2022 10:25 AM
Due: Dec 5, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0082_QC201_221120	Nov 20, 2022		Soil	L22-No0066908	X	X
2	0082_QC202_221120	Nov 20, 2022		Water	L22-No0066909		X
3	0082_QC203_221120	Nov 20, 2022		Water	L22-No0066910		X
4	0082_QC204_221120	Nov 21, 2022		Water	L22-No0066911		X
5	0082_QC205_221120	Nov 21, 2022		Water	L22-No0066912		X
6	0082_QC206_221120	Nov 21, 2022		Water	L22-No0066913		X
7	0082_QC207_221120	Nov 21, 2022		Water	L22-No0066914		X
8	0082_QC208_221120	Nov 21, 2022		Soil	L22-No0066915	X	X

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Project Name: WA_0082_PFASOMP
Project ID: WA_0082_PFASOMP

Order No.: PFAS-OMP 304700525
Report #: 945158
Phone: 0458 839 200
Fax:

Received: Nov 28, 2022 10:25 AM
Due: Dec 5, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0082_MW118D	Not Provided		Water	L22-No0066916		X
Test Counts						2	9

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	77			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	77			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	71			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	76			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	72			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	75			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	82			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	84			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	87			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	76			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	82			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	86			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	78			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	75			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	88			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	81			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	124			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	79			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	72			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	90			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	76			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	69			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	67			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	68			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	71			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	61			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	78			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	84			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	82			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	74			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M22-No0072521	NCP	%	88			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M22-No0072521	NCP	%	88			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M22-No0072521	NCP	%	83			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M22-No0072521	NCP	%	92			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M22-No0072521	NCP	%	85			50-150	Pass	
Perfluorononanoic acid (PFNA)	M22-No0072521	NCP	%	86			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M22-No0072521	NCP	%	93			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M22-No0072521	NCP	%	96			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M22-No0072521	NCP	%	95			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M22-No0072521	NCP	%	90			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M22-No0072521	NCP	%	91			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M22-No0072521	NCP	%	89			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M22-No0072521	NCP	%	87			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M22-No0072521	NCP	%	84			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M22-No0072521	NCP	%	93			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M22-No0072521	NCP	%	90			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M22-No0072521	NCP	%	83			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M22-No0072521	NCP	%	92			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M22-No0072521	NCP	%	78			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M22-No0072521	NCP	%	110			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M22-No0072521	NCP	%	85			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M22-No0072521	NCP	%	85			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M22-No0072521	NCP	%	83			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M22-No0072521	NCP	%	75			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M22-No0072521	NCP	%	86			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M22-No0072521	NCP	%	74			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M22-No0072521	NCP	%	87			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M22-No0072521	NCP	%	81			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M22-No0072521	NCP	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M22-No0072521	NCP	%	83			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	B22-No0066704	NCP	%	23	24	6.4	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-No0066739	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-No0066739	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L22-No0066739	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-No0066739	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	N/A
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS
[redacted] Senior Analyst-Sample Properties

[redacted]
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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Stantec Australia Pty Limited
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NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **945158-W**
Project name WA_0082_PFASOMP
Project ID WA_0082_PFASOMP
Received Date Nov 28, 2022

Client Sample ID			**0082_QC202_221120**	**0082_QC203_221120**	**0082_QC204_221120**	**0082_QC205_221120**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L22-No0066909**	**L22-No0066910**	**L22-No0066911**	**L22-No0066912**
Date Sampled			**Nov 20, 2022**	**Nov 20, 2022**	**Nov 21, 2022**	**Nov 21, 2022**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.02
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.02
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.02
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.02
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	55	58	65	81
13C5-PFPeA (surr.)	1	%	97	91	90	101
13C5-PFHxA (surr.)	1	%	108	103	103	106
13C4-PFHpA (surr.)	1	%	90	76	81	82
13C8-PFOA (surr.)	1	%	137	64	101	72
13C5-PFNA (surr.)	1	%	92	45	63	47
13C6-PFDA (surr.)	1	%	85	29	48	30
13C2-PFUnDA (surr.)	1	%	76	19	36	18
13C2-PFDoDA (surr.)	1	%	67	12	30	11
13C2-PFTeDA (surr.)	1	%	67	15	25	14
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	99	23	40	14
D3-N-MeFOSA (surr.)	1	%	59	22	15	16

Client Sample ID			0082_QC202_221120	0082_QC203_221120	0082_QC204_221120	0082_QC205_221120
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L22-No0066909	L22-No0066910	L22-No0066911	L22-No0066912
Date Sampled			Nov 20, 2022	Nov 20, 2022	Nov 21, 2022	Nov 21, 2022
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	44	16	14	15
D7-N-MeFOSE (surr.)	1	%	48	20	16	19
D9-N-EtFOSE (surr.)	1	%	49	21	16	19
D5-N-EtFOSAA (surr.)	1	%	68	15	28	18
D3-N-MeFOSAA (surr.)	1	%	73	22	36	19
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.15
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	[N09]0.09
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	92	85	92	88
18O2-PFHxS (surr.)	1	%	107	68	92	73
13C8-PFOS (surr.)	1	%	93	84	57	102
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	93	140	80	101
13C2-6:2 FTSA (surr.)	1	%	86	67	74	78
13C2-8:2 FTSA (surr.)	1	%	144	58	73	76
13C2-10:2 FTSA (surr.)	1	%	82	16	37	18
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.24
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.11
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	0.26
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	0.32
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	0.32

Client Sample ID			0082_QC206_221120	0082_QC207_221120
Sample Matrix			Water	Water
Eurofins Sample No.			L22-No0066913	L22-No0066914
Date Sampled			Nov 21, 2022	Nov 21, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	0.80	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	2.0	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	1.8	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	1.6	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	0.84	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	0.23	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	65	107
13C5-PFPeA (surr.)	1	%	141	106
13C5-PFHxA (surr.)	1	%	141	104
13C4-PFHpA (surr.)	1	%	118	94
13C8-PFOA (surr.)	1	%	92	91
13C5-PFNA (surr.)	1	%	101	80
13C6-PFDA (surr.)	1	%	82	68
13C2-PFUnDA (surr.)	1	%	82	51
13C2-PFDoDA (surr.)	1	%	66	43
13C2-PFTeDA (surr.)	1	%	48	17
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	95	59
D3-N-MeFOSA (surr.)	1	%	54	60
D5-N-EtFOSA (surr.)	1	%	44	70
D7-N-MeFOSE (surr.)	1	%	45	19
D9-N-EtFOSE (surr.)	1	%	51	15
D5-N-EtFOSAA (surr.)	1	%	68	34
D3-N-MeFOSAA (surr.)	1	%	84	65
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.19	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	0.07	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]0.24	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]2.7	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]0.15	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]13	[N09]0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01

Client Sample ID			0082_QC206_221120	0082_QC207_221120
Sample Matrix			Water	Water
Eurofins Sample No.			L22-No0066913	L22-No0066914
Date Sampled			Nov 21, 2022	Nov 21, 2022
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonic acids (PFSAs)				
13C3-PFBS (surr.)	1	%	83	101
18O2-PFHxS (surr.)	1	%	78	97
13C8-PFOS (surr.)	1	%	65	84
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	0.54	0.06
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	0.10	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	102	62
13C2-6:2 FTSA (surr.)	1	%	65	59
13C2-8:2 FTSA (surr.)	1	%	131	30
13C2-10:2 FTSA (surr.)	1	%	80	74
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	15.7	0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	13.84	0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	16.54	0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	23.57	0.07
Sum of PFASs (n=30)*	0.1	ug/L	24.27	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Nov 30, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Nov 30, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Nov 30, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Nov 30, 2022	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Nov 28, 2022	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: WA_0082_PFASOMP
Project ID: WA_0082_PFASOMP

Order No.: PFAS-OMP 304700525
Report #: 945158
Phone: 0458 839 200
Fax:

Received: Nov 28, 2022 10:25 AM
Due: Dec 5, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0082_QC201_221120	Nov 20, 2022		Soil	L22-No0066908	X	X
2	0082_QC202_221120	Nov 20, 2022		Water	L22-No0066909		X
3	0082_QC203_221120	Nov 20, 2022		Water	L22-No0066910		X
4	0082_QC204_221120	Nov 21, 2022		Water	L22-No0066911		X
5	0082_QC205_221120	Nov 21, 2022		Water	L22-No0066912		X
6	0082_QC206_221120	Nov 21, 2022		Water	L22-No0066913		X
7	0082_QC207_221120	Nov 21, 2022		Water	L22-No0066914		X
8	0082_QC208_221120	Nov 21, 2022		Soil	L22-No0066915	X	X

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WA 6000

Project Name: WA_0082_PFASOMP
Project ID: WA_0082_PFASOMP

Order No.: PFAS-OMP 304700525
Report #: 945158
Phone: 0458 839 200
Fax:

Received: Nov 28, 2022 10:25 AM
Due: Dec 5, 2022
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
9	0082_MW118D	Not Provided		Water	L22-No0066916		X
Test Counts						2	9

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	104			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	89			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	83			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	78			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	76			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	74			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	81			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	79			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	91			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	132			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	89			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	103			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	70			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	89			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	96			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	105			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	105			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	100			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	81			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	89			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	101			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	105			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	90			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	138			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	82			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	73			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	85			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	79			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	74			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	94			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L22-De0002658	NCP	%	106			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L22-De0002658	NCP	%	84			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L22-De0002658	NCP	%	83			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-De0002658	NCP	%	78			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L22-De0002658	NCP	%	81			50-150	Pass	
Perfluorononanoic acid (PFNA)	L22-De0002658	NCP	%	83			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L22-De0002658	NCP	%	77			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-De0002658	NCP	%	98			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-De0002658	NCP	%	99			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-De0002658	NCP	%	111			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-De0002658	NCP	%	111			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L22-De0002658	NCP	%	121			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-De0002658	NCP	%	106			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-De0002658	NCP	%	83			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L22-De0002658	NCP	%	97			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L22-De0002658	NCP	%	96			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-De0002658	NCP	%	107			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-De0002658	NCP	%	72			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L22-De0002658	NCP	%	78			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-De0002658	NCP	%	58			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-De0002658	NCP	%	74			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-De0002658	NCP	%	87			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-De0002658	NCP	%	65			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-De0002658	NCP	%	88			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-De0002658	NCP	%	64			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-De0002658	NCP	%	51			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-De0002658	NCP	%	85			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L22-De0002658	NCP	%	80			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-De0002658	NCP	%	81			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-De0002658	NCP	%	100			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L22-No0066910	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L22-No0066910	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L22-No0066910	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L22-No0066910	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L22-No0066910	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L22-No0066910	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L22-No0066910	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L22-No0066910	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L22-No0066910	CP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L22-No0066910	CP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	N/A
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS
[redacted] Senior Analyst-PFAS

[redacted]
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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APPENDIX

D

FIELD RECORDS & CALIBRATION CERTIFICATES

Cardno

now

Stantec

Monitoring Date	Monitoring Location	Sample_ID	Screen Interval	Bore Type	TOC (mAHD)	Well Depth (m)	SWL (mbTOC)	RWL (mAHD)	Other Observations	Sampling Method	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	QC Dup Sample #	Odour Comments	Colour
21/11/2022	MW022	0082_MW022_221121	4-7_	Single Level	6.675	7.0	6.14	0.535		HydraSleeve	27	2.08	645	422.5	6.92	17.3			Clear
21/11/2022	MW103D	0082_MW103D_221121	11-15_	Single Level	9.3778	15.0	8.77	0.608		HydraSleeve	28.8	3.21	4964	3230.5	7.05	0.3			Clear
21/11/2022	MW105S	0082_MW105S_221121	2-4_	Single Level	3.8438	4.0			Bore nearly dry, no field parameters recorded	HydraSleeve									Cloudy
21/11/2022	MW108	0082_MW108_221121	1.7-6.7_	Single Level	4.4433	6.7	3.94	0.5033	MW108 sampled - MW109 became inaccessible (overgrown bushland)	HydraSleeve	28.2	1.13	11918	7747	7.62	-158.6			Clear
21/11/2022	MW113	0082_MW113_221121	4.5-9.5_	Single Level	6.6842	9.5	6.05	0.634		HydraSleeve	28.5	1.58	3221	2093	7.41	48.8			Brown
21/11/2022	MW115	0082_MW115_221121	5.3-10.3_	Single Level	7.7258	10.3	7.04	0.686		HydraSleeve	29.2	2.32	4671	3035.5	6.85	46.8			Brown
21/11/2022	MW118D	0082_MW118D_221121	7.5-11.5_	Single Level	6.2622	11.5	5.87	0.392		HydraSleeve	28.6	2	4243	2756	7.23	-6.2			Clear
21/11/2022	MW122	0082_MW122_221121	3.5-8.5_	Single Level	5.0782	8.5	4.43	0.648	Sample subsequently misplaced	HydraSleeve	27.9	1.69	1073	695.5	7.18	-35.6			Cloudy
21/11/2022	MW126	0082_MW126_221121	4.5-8.5_	Single Level	4.8325	8.5			Field parameters not recorded	HydraSleeve									
20/11/2022	MW128	0082_MW128_3.7-4.2_221120	3.7-4.2_	Multi level	2.5435	4.2	2.357	0.186		Peristaltic Pump	26.6	2.45	56467	36691	7.73	-68			Cloudy
20/11/2022	MW129	0082_MW129_3.5-4.0_221120	3.5-4_	Multi level	2.5311	4.0	2.33	0.201		Peristaltic Pump	28.3	2.38	56161	36505	7.39	-58.4			Clear
20/11/2022	MW130	0082_MW130_2.9-3.4_221120	2.9-3.4_	Multi level	2.3879		2.3	0.088		Peristaltic Pump	27.8	1.06	52744	34287	7.38	-107.4			Clear
20/11/2022	MW131	0082_MW131_4.0-4.5_221120	4-4.5_	Multi level	2.8774	4.5	2.56	0.317		Peristaltic Pump	28.3	3.01	4300	2794	7.92	-57			Cloudy
21/11/2022	MW132	0082_MW132_6.4-6.9_221121	6.4-6.9_	Multi level	5.4349	6.9	5.15	0.285		Peristaltic Pump	24.8	0.9	46034	29932	7.31	-306.1		Foul odour	Cloudy
21/11/2022	MW133	0082_MW133_3.0-3.5_221121	3-3.5_	Multi level	2.1505	3.5	1.9	0.251		Peristaltic Pump	25.1	2.88	49297	32040	7.38	-77.4			Cloudy
21/11/2022	MW134	0082_MW134_6.6-7.1_221121	6.6-7.1_	Multi level	6.5343	7.1	6.15	0.384		Peristaltic Pump	29.1	1.89	40995	26640	7.07	-92.1			Clear
21/11/2022	MW135	0082_MW135_10.3-10.8_221121	10.3-10.8_	Multi level	9.301	10.8	8.77	0.531		Peristaltic Pump	31.7	2.82	22765	14795	7.49	-77.1			Brown
21/11/2022	MW137	0082_MW137_6.1-6.6_221121	6.1-6.6_	Multi level	5.3984	6.6	5.06	0.338		Peristaltic Pump	26.6	4.35	13083	8505	7.68	-77.2			Cloudy
21/11/2022	MW142	0082_MW142_221121	4.5-10.5_	Single Level	7.5281	10.5	6.84	0.688		HydraSleeve	29	1.37	5934	3867.5	6.41	-3.4			Brown
21/11/2022	MW143	0082_MW143_221121	7-13_	Single Level	10.5204	13.0	9.87	0.65		HydraSleeve	28.8	4.82	915	591.5	7.26	2			Clear
21/11/2022	MW144S	0082_MW144S_221121	2-8_	Single Level	6.0715	8.0	5.65	0.422		HydraSleeve	28.2	1.68	3977	2584	7.91	-150.6	QC106/206		Cloudy
21/11/2022	MW145	0082_MW145_221121	0.9-6.9_	Single Level	3.8644	6.9	3.66	0.204		HydraSleeve	28	1.43	49182	31971	7.14	-73.4	QC104/204		Clear
21/11/2022	MW147	0082_MW147_221121	4.5-8.5_	Single Level	5.51	8.5	5.35	0.16		HydraSleeve	28.4	1.04	33336	21669	7.07	-130.8			Cloudy
21/11/2022	MW148S	0082_MW148S_221121	3-9_	Single Level	5.7648	9.0	5.41	0.355		HydraSleeve	29.5	2.33	42330	27470	7.08	-80.4			Cloudy
21/11/2022	MW151S	0082_MW151S_221121	1-5_	Single Level	3.4	5.0	3.2	0.2		HydraSleeve	29.3	1.01	54026	35119	7.18	-92			Cloudy
21/11/2022	MW152S	0082_MW152S_221121	2.5-6.5_	Single Level	3.4103	6.5	3.18	0.23		HydraSleeve	29.5	1.09	49301	32041	7.33	-112			Cloudy
21/11/2022	MW153S	0082_MW153S_221121	2-6_	Single Level	4.7872	6.0	4.02	0.767		HydraSleeve	29	3.7	47262	30745	6.98	10.9			
21/11/2022	MW154S	0082_MW154S_221121	2-6_	Single Level	3.8177	6.0	3.21	0.608		HydraSleeve	27.9	0.76	29756	19337.5	5.89	43.2			Clear
21/11/2022	MW155S	0082_MW155S_221121	2.5-8.5_	Single Level	5.0072	8.5	4.69	0.317		HydraSleeve		0.55	19186	12471	6.96	-109.2			Clear
21/11/2022	MW310	0082_MW310_221121	3.5-6.5_	Single Level	5.401		4.85	0.551		HydraSleeve	29.5	2.6	3351	2177.5	6.96	48.6			Brown
21/11/2022	MW311	0082_MW311_221121	2.5-5.5_	Single Level	4.205	5.5	3.63	0.575		HydraSleeve	28.7	3.85	480	312	7.87	22.2	QC105/205		Brown
21/11/2022	MW315	0082_MW315_221121	6.5-9.5_	Single Level	8.018	9.5	7.4	0.618		HydraSleeve	28.7	2.71	1590	1033.5	7.51	31.6	QC107/207		Clear
21/11/2022	MW326	0082_MW326_221121	NA	Single Level	2.611	NA	2.31	0.301		HydraSleeve	29	0.66	36512	23735	7.44	-134.3			Cloudy

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D2 - Seepage water Field Records

Monitoring Date	Monitoring Location	Sample_ID	Observations	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	QC Dup Sample #	Odour ?	Colour
20/11/2022	OTH101	0082_OTH101_221120		19.2	3.45	55494	36071	8.06	-37.2		no	Clear
20/11/2022	OTH102	0082_OTH102_221120	QC102/202	21.9	3.6	54368	35337	8.12	-23.4	102/202	no	Clear
20/11/2022	OTH103	0082_OTH103_221120		22.9	4.16	55347	35970	8.19	-54.2		no	Clear
20/11/2022	OTH104	0082_OTH104_221120		23.5	4.37	55345	35964	8.16	-63.5		no	Clear
20/11/2022	OTH105	0082_OTH105_221120		24.8	3.9	54757	35579	8.09	-45.4		no	Clear
20/11/2022	OTH106	0082_OTH106_221120		24	3.89	55181	35870	8.09	-55.2		no	Clear

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D3 - Surface water Field Records

Monitoring Location	Date	Sample ID	Sampling Method	Sample Depth (m)	WaterBody Depth (m)	Flow Rate	Comments	Temp (°C)	DO (mg/L)	EC (us/Cm)	TDS (mg/L)	pH	Eh (mV)	Water Colour	Turbidity
SW161	20/11/2022						Dry								
SW162	20/11/2022						Dry								
SW163	20/11/2022						Dry								
SW164	21/11/2022						Dry								
SW165	21/11/2022						Dry								
SW181	20/11/2022	0082_SW181_221120	Direct into Bottle	0.1	0.5	Slow	QC103/203	29.3	0.01	108660	70822	8.15	-16.6	Green	Medium

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D4 - Sediment Field Records

Monitoring Location	Date	Sample ID	Depth of Sediment Sampling (m)	Sampling Method	Sample Condition	Sample Description	Comments
SD161	20/11/2022	0082_SD161_221120	0.1	Shovel, Trowel	Dry	Sandy clay. beige brown	
SD162	20/11/2022	0082_SD162_221120	0.1	Shovel, Trowel	Wet	Black/brown clay, salt crust on surface	QC101/201
SD163	20/11/2022	0082_SD163_221120	0.1	Shovel, Trowel	Wet	Black clay very stiff	
SD164	21/11/2022	0082_SD164_221121	0.1	Shovel, Trowel	Dry	Sand, fine to med grained, brown, trace organics	QC108/208
SD181	20/11/2022	0082_SD181_221120	0.1	Shovel, Trowel	Wet	Black clay	
SS165	21/11/2022	0082_SS165_221121	0.1	Shovel, Trowel	Dry	Sand, fine to med grained, brown, trace gravels	
SS167	21/11/2022	0082_SS167_221121	0.1	Shovel, Trowel	Dry	Orange loose fine sandy clay	
SS169	21/11/2022	0082_SS169_221121	0.1	Shovel, Trowel	Dry	Orange loose sandy clay, fine	
SS171	21/11/2022	0082_SS171_221121	0.1	Shovel, Trowel	Dry	Fine orange clay	
SS173	21/11/2022	0082_SS173_221121	0.1	Shovel, Trowel	Dry	Orange fine clay	
SS179	21/11/2022	0082_SS179_221121	0.1	Shovel, Trowel	Dry	Orange soft fine clay	

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 21D101799
Cable length: 1m 21B100351

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	0.0.78
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	172.60 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.25
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 10 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature	Check Temp NATA	Room Temp	18.8	0	°C	NA	18.8	°C
pH (22D)	pH 7.00	375757	7.01	-3.80	mV	7.06	7.01	pH
pH (22D)	pH 4.00	378281	4.00	168.80	mV	4.03	4.00	pH
Conductivity (21B100530)	2764 µs/cm at 25°C	21/1012	2764	GLP	5.07	2802	2764	µs/cm
ORP (210322SIA605102)	Zobell A & B	22/0103	243	243	mV	230.8	232.2	mV
Zero DO (20K100253)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.3	0.0	%
100% DO (20K100253)	100% Air Saturation	Air	100.0	5.1	uA	105.8	100.0	%

Calibrated by: Gaurav Kanwar

Calibration Date: 11-Nov-22
Next Due: 10-May-23

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 20D101039
Cable length: 1m 20A100403

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	173.00 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.53
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 4 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (11H100544)	Check Temp NATA	Room Temp	18.6	-1.1	°C	NA	17.5	°C
pH (21K)	pH 7.00	375757	7.01	-8.60	mV	7.05	7.01	pH
pH (21K)	pH 4.00	378281	4.00	164.40	mV	4.03	4.00	pH
Conductivity (11H100544)	2764 µs/cm at 25°C	21/1012	2764	GLP	4.84	2773	2764	µs/cm
ORP (200408SIA605101)	Zobell A & B	22/0103	246	246	mV	239.9	241.8	mV
Zero DO (20B140053)	NaSO3 in distilled water	10175	0.0	NA	NA	0.2	0.0	%
100% DO (20B140053)	100% Air Saturation	Air	100.0	4.96	uA	98.3	100.0	%

Calibrated by: Gaurav Kanwar

Calibration Date: 09-Nov-22
Next Due: 08-May-23

Date of Bump Test	Site ID	Unit Brand/ Model	Ambient Air Oxygen Calibration	Zero % Oxygen Solution Calibration	Standard Concentrations	Ambient Temperature (°C)	Bump Test Reading	Bump Test Readings within ±5%?	Comment	Test by (Name)	(Signature)
21/11/22	0082 Heli-B	YSI #21D0749	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: ~~1,413µS/cm~~ 35,000 (Y) / N	31.6	pH 4.00: 4.19 pH 7.00: 7.18 EC: 35,084	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) / N	Nil.	D. STUPPARD	D. STUPPARD
21/11/22	0082 Heli-B	YSI # 20D10094	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: ~~1,413µS/cm~~ 35,000 (Y) / N	28.4	pH 4.00: 4.02 pH 7.00: 7.08 EC: 35,114	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) N	Nil.	D. STUPPARD	D. STUPPARD

[redacted]

APPENDIX

E

DATA QUALITY REVIEW

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Data Quality Review
PFAS Ongoing Monitoring Plan
November 2022 Monitoring Event

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as trip blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

QA/QC Aspects	Evidence & Evaluation
	QA Documentation
Project Quality Plan/Work Plan and Data Quality Objectives	The field investigation was carried out on 20th and 21st November 2022 and is generally in accordance with the proposed scope of work, as documented in the SAQP (PFAS OMP SAQP HEH-B, Cardno, November 2022) issued to the client and in general compliance with Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling,* NEPM "*National Environment Protection (Assessment of Site Contamination) Measure"* and PFAS NEMP 2.0. A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (PFAS OMP November 2022 Factual Report). In addition, a safety, health and environment work method statement (SHEWMS) was also prepared. The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.
	Data Representativeness
Use of Composites	No Composites were used during the investigation
Holding Times	Chain of custody and laboratory reports provide evidence of holding times. Holding times were generally in compliance with required timeframes. The following holding time exceedance was reported: ▪ Dissolved Major Cations – 1-2 day(s) overdue: - EP2215641 (OTH101, OTH102, OTH103, OTH104, OTH105, OTH106, SW181) - EP2215643 (MW128, MW129, MW130, MW131) - EP2215715 (MW118D) The holding time exceedances for a minority of results are due to the remoteness of the site and the timing of the freight services. They are not considered to have adversely impacted the reliability of the results obtained, or the conclusions drawn from this assessment. Cardno ensures sample integrity by using overnight freight services where possible and keeping samples chilled with bagged ice.
Verification of field procedures	The methodology conducted during this investigation is documented in the body of the report, and was in general conformance with the SAQP. Non-disposable equipment was decontaminated between sample locations.
Laboratory Reports	The following laboratory reports were considered for this data quality review: ▪ ALS reports: EP2215641, EP2215642, EP2215643, EP2215715, EP2215716. ▪ Eurofins ARL report: 94158.

QA/QC Aspects	Evidence & Evaluation

Data Precision & Accuracy

QC sample Frequency

QC sample type	SAQP required frequency	Sample Collected
Blind duplicate	1 in 10 primary samples (10%)	5 for 38 groundwater samples (13.1%) 1 in 1 surface water sample (100%) 2 in 11 sediment samples (18.2%)
Interlab duplicate	1 in 10 primary samples (10%)	5 for 38 groundwater samples (13.1%) 1 in 1 surface water sample (100%) 2 in 11 sediment samples (18.2%)
Rinsate	1 per field personnel per day	3 for 2 days (1-2 field personnel) (100%)
Field Blank	1 per field personnel per day	3 for 2 days (1-2 field personnel) (100%)

The required QC frequency was achieved for all media sampled.

RPD Acceptance criteria

Magnitude of Results	Acceptable RPD range
< 10 x LOR	No limits
10 – 20 LOR	0% - 50%
> 20 x LOR	0% - 20%

QC Testing – Blind Duplicates (Primary Lab)

Groundwater

- Primary Groundwater Samples Analysed: 38
- Blind Duplicate Samples Analysed: 5

All RPDs were within acceptance criteria.

Surface water

- Primary surface water Samples Analysed: 1
- Blind Duplicate Samples Analysed: 1

All RPDs were within acceptance criteria.

Sediment

- Primary Sediment Samples Analysed: 11
- Blind Duplicate Samples Analysed: 2

All RPDs were within acceptance criteria.

QC Testing – Interlab Duplicates (Secondary Lab)

Groundwater

- Primary Groundwater Samples Analysed: 38
- Interlab Duplicate Samples Analysed: 5

All RPDs were within acceptance criteria with the following exceptions:

- QC205 (PFOS – 112%) The primary sample reported higher concentrations therefore the results used for reporting are considered conservative.
- QC206 (PFPeS – 25%, PFOS – 27%, PFHxA – 21%, PFNA – 33%)

These minor RPD exceedances are likely due the difference of methodologies between the primary and secondary laboratories and the low concentrations of

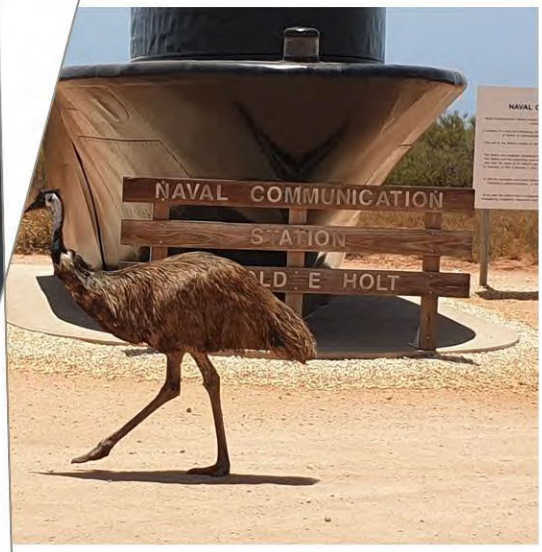
QA/QC Aspects	Evidence & Evaluation
	analytes under review. This is not considered to have impacted the validity of the interpretation drawn upon this dataset. ***Surface water*** ▪ Primary surface water Samples Analysed: 1 ▪ Interlab Duplicate Samples Analysed: 1 All RPDs were within acceptance criteria. ***Sediment*** ▪ Primary sediment Samples Analysed: 11 ▪ Interlab Duplicate Samples Analysed: 2 All RPDs were within acceptance criteria.
Field Blanks	Field Blanks were collected at a rate of one per fieldwork team per day. All field blank samples tested reported analytes below the laboratory limit of reporting.
Laboratory Internal QC	Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, matrix spikes, laboratory control samples and laboratory duplicates. All Method Blank results were within acceptable range. All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% with the exception of the following: ▪ EP2215641: - Sample ID: OTH101: Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. - Sample ID: Anonymous: PFHxS, PFOS, PFPeA, PFHxA, 6:2FTS matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2215643: - Sample ID: MW128: Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2215715: - Sample ID: Anonymous: Sulfate matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. - Sample ID: MW142: PFHxS, PFOS, PFPeA, PFHxA, 6:2FTS matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. The following quality control samples frequency outliers were reported: ▪ EP2215715: - Laboratory Duplicates: PFAS by LCMSMS, expected frequency of 10% not achieved. The above outliers/exceptions are not considered to affect the reliability of the dataset.
Laboratory Method Detection Limit	Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.
NATA endorsement of laboratory reports	Laboratory reports were stamped with the NATA endorsement stamp and signature. ALS Accreditation No. 825 Eurofins ARL Accreditation No. 1261
Calibration of Field Equipment	All equipment used during the investigation was calibrated by the supplier prior to use and daily readings of reference solutions (bump tests) were completed. The equipment calibration certificates and daily field bump test records are provided in Appendix D.

QA/QC Aspects	Evidence & Evaluation
Decontamination and Equipment Blanks	Rinsate blanks were collected at a rate of one per day per sampler when reusable equipment was used. All rinsate samples tested reported analytes concentrations below the laboratory LORs.
	Data Comparability
Standard Procedures	Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.
Qualified Personnel	Staff involved in managing and reviewing the project and those involved in fieldwork are experienced and qualified personnel.
Sample Integrity	Field Chain of Custody/Laboratory request forms can be found in Appendix C.
	Data Completeness
Completeness of test program	The scope of work undertaken was generally consistent with the SAQP.
Validity of Data Set	The data quality review indicates no significant systematic errors in the data collection process and therefore, the data set used as the basis for groundwater, surface water, seepage water and sediment investigation is considered valid and complete.

PFAS OMP Biannual Monitoring Event Factual Report

June 2023

Naval Communication Station Harold E Holt Area B



Prepared for
Department of Defence

31 August 2023

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

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Chemical Names

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

Technical Terms

AFFF	Aqueous Film-Forming Foam
AHD	Australian Height Datum
AS	Australian Standard
BGL	Below Ground Level
COC	Chain of Custody
DQI	Data Quality Indicator
DQO	Data Quality Objective
DSI	Detailed Site Investigation
EC	Electrical Conductivity
EPA	Environment Protection Authority
ERA	Ecological Risk Assessment
ESA	Environmental Site Assessment
HEPA	Heads of Environmental Protection Authority
HIL	Health Investigation Level
HSL	Health Screening Level
LOR	Limit of Reporting
N/A	Not Applicable
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NEPM	National Environmental Protection Measure
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percentage Difference
SAQP	Sampling and Analysis Quality Plan
SWL	Standing Water Level

Units

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

Site Specific

HEH-B	Naval Communication Station Harold E Holt Area B
OMP	Ongoing Monitoring Plan
WWTP	Waste water treatment plant

1 Introduction

1.1 Background

Cardno, now Stantec ("Cardno") was engaged by the Australian Department of Defence ("Defence") to carry out the Per- and Poly-Fluoroalkyl Substances (PFAS) Ongoing Monitoring Plan (OMP) biannual sampling event at the Naval Communication Station Harold E Holt - Area B ("HEH-B" or "the site"). The site is situated at the end of the North-West Cape of Western Australia (WA), at the northern edge of Exmouth (Figure 1, Appendix A).

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

- Cardno, 1 June 2023, Reference: 304700525, '*PFAS Ongoing Monitoring Plan Sampling and Analysis Quality Plan (SAQP) Naval Communication Station Harold Holt B' Rev 8*.

The SAQP was reviewed prior to the monitoring event and the following changes were made:

- The methodology for groundwater field parameters recording was updated.

For the purposes of this report:

- "the site" was defined as Harold E Holt – Area B.
- "the Management Area" was defined as comprising the site, plus the land extending to the Exmouth Gulf (to the east and north-east) (Figure 2, Appendix A).

1.2 Purpose & Objectives

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

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

The objectives of the report are:

- To provide a succinct summary of the June 2023 monitoring event and provision of analytical results with supporting tables and figures.
- To provide confirmation of the current understanding of risk.
- To provide supporting data for the assessment of management actions, where relevant.

1.3 Relevant Guidelines

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

- National Environment Protection Council (NEPC), 1999, *National Environmental Protection (Assessment of Site Contamination) Measure* (as amended 2013) (ASC NEPM).
- Heads of Environmental Protection Authority's Australia and New Zealand (HEPA), January 2020, *PFAS National Environmental Management Plan (NEMP) 2.0*.
- Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils*, Part 1 - Non-volatile and semi-volatile compounds[1].
- Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling*.
- Australian and New Zealand Guidelines (ANZG), *2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.

[1] It is noted that this AS has been withdrawn and is referenced here as a state of knowledge document.

- Department of Water and Environmental and Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*[2].
- Department of Defence, Department of Energy, 2018, *Quality System Manual Schedule B15*.
- U.S. Environmental Protection Agency (EPA), 2000, *Guidance for the Data Quality Objectives Process* (EPA QA/G-4).
- USEPA, 2002, *Guidance on Environmental Data Verification and Data Validation* (EPA QA/G-8).
- National Health and Medical Research Council (NHMRC), August 2019, *Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water*.

2 Scope of Work

Cardno carried out the tasks detailed in the following sections in order to satisfy the purpose and objectives of this assessment.

2.1 Groundwater Monitoring

Sampling of selected groundwater wells was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The groundwater wells monitored as part of the OMP are presented in Table 2-1, and are shown on Figure 4, Appendix A.

Table 2-1 Groundwater Monitoring Locations

Monitoring Area	Location ID	Number
On-site – Source South	MW310, MW311, MW315, MW103D, MW113, MW115, MW142, MW143	8
Off-site – Source South	MW135, MW122, MW126, MW144S	4
On-site – Source North	MW326, MW105S, MW108, MW145	4
Off-site – Source North	MW134, MW147, MW148S	3
Off-site – Pathway 1	MW151S, MW152S, MW153S, MW154S, MW137, MW155S	6
Off-site – Pathway 2	MW118D, MW133, MW022	3
Off-site – Receptor A	MW128, MW129, MW130, MW131, MW132	5

2.2 Seepage water Monitoring

Sampling of selected seepage water monitoring locations was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The seepage water locations monitored as part of the OMP are presented in Table 2-2 and are shown on Figure 4, Appendix A.

Table 2-2 Seepage water Monitoring Locations

Monitoring Area	Location ID	Number
Off-site – Receptor C	OTH101, OTH102, OTH103, OTH104, OTH105, OTH106	6

2.3 Surface water Monitoring

Sampling of selected surface water monitoring locations was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The surface water locations monitored as part of the OMP are presented in Table 2-3 and are shown on Figure 4, Appendix A.

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

Table 2-3 Surface water Monitoring Locations

Monitoring Area	Location ID	Number
Off-site - Pathway 2	SW164, SW181, SW165, SW167, SW169, SW171, SW173, SW179	8
Off-site - Receptor B	SW161, SW162, SW163	3

2.4 Sediment Monitoring

Sampling of selected sediment monitoring locations was performed in accordance with the SAQP, applying methods set out in Section 3 of this report. The sediment locations monitored as part of the OMP are presented in Table 2-4 and are shown on Figure 5, Appendix A.

Table 2-4 Sediment Monitoring Locations

Monitoring Area	Location ID	Number
Off-site - Pathway 2	SD164, SD181, SS165, SS167, SS169, SS171, SS173, SS179	8
Off-site - Receptor B	SD161, SD162, SD163	3
Note: 'SS' prefix indicates a shallow soil (dry) location, 'SD' prefix a sediment (wet) location		

2.5 Data Management

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

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

2.6 Deviations from the OMP SAQP

Deviations from the SAQP (Cardno, 2023) for the June 2023 monitoring event are presented in Table 2-5.

Table 2-5 Summary of deviations from the OMP SAQP

Location	Deviation	Comments
SW161, SW162, SW163, SW164, SW165, SW167, SW169, SW171, SW173, SW179	Not Sampled	These surface water monitoring locations were found dry. Limited impact on the OMP, sediment data collected at the co-located monitoring locations.
MW131	No SWL recorded	The water level was not recorded at MW131. This is expected to have a limited impact on the OMP as the groundwater contours can be inferred from the rest of the well network.
MW115	Only sampled for PFAS	Insufficient amount of water in sleeve. No impact, non-PFAS analytes and field parameters do not inform critical OMP decisions.
MW129, MW130, MW132, MW134, MW135	Field parameters recorded once prior to sampling	The field parameters were recorded once, prior to sampling, rather than three consecutive readings during pumping. The field parameters at these wells were consistent with the historical range, and the deviation from the SAQP is not expected to significantly impact investigation outcomes.

3 Methodology

3.1 Groundwater Sampling Methodology

Groundwater monitoring was undertaken applying the methods detailed in Table 3-1.

Table 3-1 Groundwater Sampling Method

Activity	Details
Well Gauging	Standing Water Level (SWL) were gauged using an interface probe. All wells were measured against a surveyed mark at the top of the well casing.
Groundwater Field Parameters	For the single level wells, the field parameters were recorded via a water quality meter from the HydraSleeves® or hand bailed water. For the multilevel wells, the field parameters were recorded with a flow through cell during purging. The following field parameters were recorded: ▪ pH. ▪ electrical conductivity (EC). ▪ oxidation reduction potential (ORP). ▪ Dissolved oxygen (DO). ▪ Temperature. Once field parameters have stabilised (as indicated by at least three consecutive measurements falling within +/- 10% of each other) measurement were recorded on field data records. All field instruments (e.g., water quality meter) were calibrated by the equipment supplier and bump tested daily to optimise the accuracy of the measurements taken. Calibration certificates and bump tests records are provided in Appendix D.
Deployment and Retrieval of HydraSleeves® (single level well sample collection)	HydraSleeves® were deployed with top weight sample collection to begin at the lowest point. HydraSleeve® sampling devices were left in wells for a minimum of 24 hours to allow restabilisation of the well following the slight disturbance caused by sampler deployment. Samples were collected via continuous pull method at a rate allowing the water to pass through the check value into the sample sleeve. Samples were discharged immediately (minimise changes in chemistry) via discharge tube. Following sampling, HydraSleeves® were deployed in preparation for the next OMP monitoring event using the same string for consistency between events (same depth of sampling i.e. within screen).
Peristaltic pump (multi-level well sample collection)	The shallowest (non-dry) wells were sampled at each multi-level well location using Teflon-free dedicated and disposable high-density polyethylene (HDPE) tubing coupled to a peristaltic pump system. The groundwater was purged at a low flow rate of 0.2 L/min. SWL and field parameters were measured during purging and post sample collection to ensure limited drawdown effects. The groundwater was sampled when the field parameters had stabilised.
Alternative sampling methodology (hand bailing)	Disposable HDPE hand bailers, attached to a polypropylene string, were used when the water column wasn't sufficient to fill the HydraSleeves®. Purging of the well (removal of 3x well volume) was undertaken prior to sampling to ensure that a sample representative of the aquifer is taken.
Decontamination procedure	Dedicated HydraSleeves®/tubing were used at each groundwater bore thus removing the need for decontamination. All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.

Activity	Details
Sample identification, preservation transport and holding times	Each sample was pre-labelled by the laboratory with a unique barcode and then scanned into a mobile application to generate the Chain of Custody (CoC). Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under CoC documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).
Laboratory Testing	Groundwater samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity, and ionic balance). The primary laboratory was ALS Global Laboratories (Perth), and the secondary laboratory (quality control) was Eurofins ARL (Perth). Both laboratories are NATA-accredited for the parameters tested. Copies of the NATA stamped laboratory reports and CoC documentation are included in Appendix C.
Laboratory Testing – Quality Control	Groundwater QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2023): ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples and sent to a secondary laboratory. ▪ Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g., interface probe)]. ▪ Field blank samples at 1 per day.

3.2 Seepage water Sampling Methodology

Seepage water monitoring procedure is detailed in Table 3-2.

Table 3-2 Seepage water Sampling Method

Activity	Details
Field parameters	In-situ water parameters were measured from water seeping into the excavation using a calibrated water quality meter following purging (using a dedicated syringe or jug). The following field parameters were recorded using a water quality meter: ▪ pH. ▪ EC. ▪ ORP. ▪ DO. ▪ Temperature. Field observations such as water flow, odours or sheen presence were also recorded on field sampling sheets.
Sampling Method	Sampling was carried out in a two-hour period; one hour each side of the low tide. Sampling protocol involved a shallow excavation in the beach sand; just above where inundation by wave action is occurring. Sampling containers were be lowered into the exposed seepage water and filled.
Decontamination procedure	All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.

Activity	Details
Sample identification, preservation transport and holding times	Each sample was pre-labelled by the laboratory with a unique barcode and then scanned into a mobile application to generate the CoC. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under CoC documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).
Laboratory Testing	Seepage water samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance).
Laboratory Testing – Quality Control	Seepage water QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2023): ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples and sent to a secondary laboratory. ▪ Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)]. ▪ Field blank samples at 1 per day.

3.3 Surface water Sampling Methodology

Surface water monitoring procedure is detailed in Table 3-3.

Table 3-3 Surface water Sampling Method

Activity	Details
Field parameters	The following field parameters were recorded using a water quality meter: ▪ pH. ▪ EC. ▪ ORP. ▪ DO. ▪ Temperature. Field observations such as water flow, odours or sheen presence were also recorded on field sampling sheets.
Sampling Method	Surface water samples were collected directly into sample containers using a ‘Grab’ (manual) sample method via a long handled sampling device. Where depth permits, the sample container was positioned at least 10 cm below the surface water level and above the sediment bed and oriented with the capped opening facing downwards to avoid the collection of surface films.
Decontamination procedure	All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Sample identification, preservation transport and holding times	Each sample was pre-labelled by the laboratory with a unique barcode and then scanned into a mobile application to generate the CoC. Samples were collected directly into appropriately preserved laboratory supplied bottles (Teflon-free) and packed in chilled containers for delivery to the laboratory under CoC documentation. Sample containers, preservation procedures, sample storage requirements and holding times were undertaken in accordance with those recommended by Standards Australia (AS/NZS 5667.1:1998 and AS 4482.1 as appropriate).

Activity	Details
Laboratory Testing	Surface water samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes). ▪ Major anions and cations (include calcium, magnesium, sodium, potassium, chloride, sulfate, alkalinity and ionic balance).
Laboratory Testing – Quality Control	Surface water QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2023): ▪ Field duplicate (intra-laboratory) samples at 1 per 10 water samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 water samples and sent to a secondary laboratory. ▪ Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. interface probe)]. ▪ Field blank samples at 1 per day.

3.4 Sediment Sampling Methodology

Sediment sampling methodology is detailed in Table 3-4.

Table 3-4 Sediment Sampling Method

Activity	Details
Sample Collection	Sediment samples were collected at the sediment/water interface using hand tools (e.g., trowel, hand auger, PVC pipe etc.) with samples placed directly into appropriately labelled, laboratory supplied sample containers and packed in chilled containers for delivery to the laboratory under CoC documentation. At each sampling location, the sediment sample was visually assessed, and observations (including physical description) recorded on field data sheets.
Field Records	The following information was recorded on the field data sheets: ▪ Sampling time, date, and name of the sampler. ▪ Weather conditions. ▪ Sample Collection method. ▪ Sampling equipment decontamination procedures where non-disposable sampling equipment is utilised.
Decontamination	All re-usable sampling equipment was thoroughly washed using PFAS & phosphate-free detergent, then double rinsed with clean water before the sample collection.
Laboratory Testing	Sediment samples were submitted for the following analysis: ▪ Full PFAS analytical suite (refer to the SAQP for full list of analytes).
Laboratory Testing – Quality Control	Sediment QC samples were collected at the following frequencies as detailed in the SAQP (Cardno, 2023): ▪ Field duplicate (intra-laboratory) samples at 1 per 10 sediment samples or 1 per batch if the batch is less than 10 samples. ▪ Field triplicate (inter-laboratory) samples at 1 per 10 sediment samples and sent to a secondary laboratory. ▪ Rinsate blank sample at 1 per day [collected off re-used sampling equipment (e.g. trowel)]. ▪ Field blank samples at 1 per day.

3.5 Quality Control / Quality Assurance

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

> QA documentation.

> Bias.

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

A detailed review of these aspects has been undertaken, the results of which are presented in Appendix E.

The QA/QC review concluded that there are no significant systematic errors in the data collection process and therefore, the dataset used for the assessment is considered valid and complete.

3.6 Assessment Criteria

3.6.1 Groundwater, Seepage water and surface water

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

Table 3-5 Criteria for Groundwater, Seepage water and Surface water

Exposure Scenario	Adopted Assessment Criteria		Guidance
	PFHxS / PFOS	PFOA	
	µg/L		
Human Health – Recreational Water	2[1]	10	NHMRC 2019, HEPA 2020
Ecological – 99% species protection	0.00023[2]	19	HEPA 2020

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

3.6.2 Sediment

It is noted that there are currently no Australian regulatory endorsed assessment levels for risk posed to ecology or human health by PFAS in sediment. Sediment results have been compared to available historical data for the purpose of this assessment.

4 Field Observations and Results

4.1 General Observations

The site experienced below average rainfall for the months leading to the June 2023 monitoring event, with 0mm of rainfall recorded in May and April, and 18.8mm recorded in June prior to the monitoring event. The drainage channel going from the site to the Exmouth Gulf was observed to be mostly dry at the time of monitoring.

4.2 Groundwater

4.2.1 Summary of Field Observations

4.2.1.1 Physicochemical parameters

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the groundwater sampling program are presented in field sampling records, included in Appendix D. Groundwater condition was recorded to be aerobic (DO>0.5 mg/L), fresh to saline [TDS ranging from 329 (MW311) to 36,920 mg/L (MW128)], near neutral [pH ranging from 6.76 (MW154S) to 7.99 (MW315)] and the average groundwater temperature was 27.2°C. Field parameters were generally consistent with the previous monitoring events.

4.2.1.2 Groundwater Elevation and Migration

Groundwater elevations ranged from 0.075 mAHD (MW130) to 3.45 mAHD (MW135).

Groundwater flow direction was interpreted to be in a generally easterly direction towards the Exmouth Gulf for the eastern part of the Management Area and towards the north-east beneath the Base. This is similar to the inferred groundwater contours from previous monitoring events.

Groundwater elevation contours and flow direction are shown in Figure 3, Appendix A. Gauging records are presented in Appendix D.

4.2.2 Groundwater Laboratory Results

4.2.2.1 PFAS analytes

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

Table 4-1 Summary of Groundwater Results Exceeding Adopted Criteria

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	10[2]	0.88 (MW144S)	33	0
PFOS	MW022, MW103D, MW105S, MW108, MW113, MW115, MW118D, MW126, MW133, MW142, MW143, MW144S, MW154S, MW310, MW311, MW326	0.01[3]	12 (QC203 [MW142 [triplicate])	33	16
Sum of PFOS and PFHxS	MW022, MW103D, MW105S, MW115, MW118D, MW142, MW143, MW144S, MW310	2[2]	13.1 (MW310)	33	9

Notes:

1. Non inclusive of quality control samples
2. HEPA 2020 guideline value for human health – Recreational Use

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria

3. HEPA 2020 guideline value for ecological 99% species protection (LOR adopted)

Findings are summarised as follows:

> There was no first-time detection of PFOA or Sum of PFOS and PFHxS or new exceedance of guideline values at the groundwater monitoring locations during the June 2023 monitoring event.

4.2.2.2 Non-PFAS analytes

Tabulated laboratory results for non-PFAS analytes are provided within Appendix B. Results were compared to historical range for each monitoring location. Total anions concentrations ranged from 4.76 (MW311) to 589 (MW128) meq/L. Total cations concentrations ranged from 4.74 (MW311) and 689 (MW128) meq/L. Non-PFAS analytes concentrations were of the same order of magnitude as previous monitoring events.

4.3 Seepage water

4.3.1 Summary of Field Observations

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the seepage water sampling program are presented in field sampling records, included in Appendix D. Seepage water condition was recorded to be aerobic [DO ranging from 3.46 (OTH101) to 8.36 mg/L (OTH102)], saline [TDS ranging from 35,613 (OTH104) to 37,355 mg/L (OTH105)], near neutral [pH ranging from 7.78 (OTH102) to 8.15 (OTH106)] and the average seepage water temperature was 18.6°C. Field parameters were generally consistent with the previous monitoring events.

4.3.2 Laboratory Results

4.3.2.1 PFAS analytes

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

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

Analytes	Locations Exceeding Criteria	Lowest Criteria (µg/L)	Max Conc. (µg/L)	No. Analytical Results[1]	No. Results Above Criteria
PFOA	-	10[2]	<0.01	6	0
PFOS	-	0.01[3]	<0.01	6	0
Sum of PFOS and PFHxS	-	2[2]	<0.01	6	0

Notes:

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

Findings are summarised as follows:

> All six seepage water samples reported PFAS concentrations below the laboratory LOR.

> There was no first-time detection of PFOA or Sum of PFOS and PFHxS at the seepage water monitoring locations during the June 2023 monitoring event.

> No new exceedance of a guideline value was reported for any of the seepage water monitoring locations during the June 2023 monitoring event.

4.3.2.2 Non-PFAS analytes

Tabulated laboratory results for non-PFAS analytes are provided within Appendix B. Results were compared to historical range for each monitoring location. Total anions concentrations ranged from 559 (OTH101) and 582 (OTH105) meq/L. Total cations concentrations ranged from 640 (OTH105) and 691 (OTH101) meq/L. Non-PFAS analytes concentrations were of the same order of magnitude as previous monitoring events.

4.4 Surface water

4.4.1 Summary of Field Observations

Surface water sampling was limited as all but one (SW181) monitoring locations were found dry. Only one surface water sample was collected during the June 2023 monitoring event.

Stabilised physicochemical parameters, water colour and turbidity observations recorded during the surface water sampling program are presented in field sampling records, included in Appendix D. Field parameters for SW181 were generally consistent with the previous monitoring events for this location.

4.4.2 Laboratory Results

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

Findings are summarised as follows:

- There was no first-time detection of PFOA or Sum of PFOS and PFHxS at the surface water monitoring location sampled during the June 2023 monitoring event.
- No new exceedance of a guideline value was reported for the surface water monitoring location during the June 2023 monitoring event.
- SW181 reported all PFAS concentrations below the laboratory LOR.

4.5 Sediment

4.5.1 Summary of Field Observations

Observations recorded during the sediment sampling program are provided in the field sampling records within Appendix D.

4.5.2 Laboratory Results

Tabulated analytical results including non-PFAS analytes are provided within Appendix B. Laboratory results have been compared to available historical data in order to identify monitoring locations where a first-time detection of Sum of PFOS and PFHxS or PFOA were reported. Figure 5 in Appendix A presents the sediment monitoring locations. The laboratory reports are provided in Appendix C.

Findings are summarised as follows:

- No first-time detection of PFOA or the Sum of PFOS and PFHxS above the LOR was reported during the June 2023 monitoring event.

4.6 Changes to the Monitoring Network Condition

The vegetation in the bushland surrounding the site appears overgrown and some tracks are no longer accessible with a vehicle.

No other changes to the monitoring network have been made during the June 2023 monitoring event.

5 Summary and Conclusions

Cardno undertook the June 2023 groundwater, seepage water, surface water and sediment monitoring event at HEH-B as part of the PFAS OMP. Sampling and testing was undertaken at 33 monitoring wells, one (1) surface water monitoring location, six (6) seepage water monitoring locations and 11 sediment monitoring locations.

Groundwater levels were gauged in all wells before sampling. Groundwater flow direction was interpreted to be in a generally easterly direction towards the Exmouth Gulf for the eastern part of the Management Area and towards the north-east beneath the Base. This is similar to the inferred groundwater contours from the June 2022 monitoring event.

The groundwater laboratory results reported the following:

- Of the 33 groundwater monitoring wells that were tested, PFOS (16 wells) and Sum of PFOS and PFHxS (9 wells) reported concentrations that exceeded the HEPA (2020) ecological guideline value for 99% protection species and HEPA (2020) guideline value for recreational use respectively.
- There was no first-time detection of PFOA or Sum of PFOS and PFHxS or new exceedance of guideline values at the groundwater monitoring locations during the June 2023 monitoring event.

The seepage water laboratory results reported the following:

- All six samples that were tested reported PFAS concentrations below the laboratory LOR.
- No first-time detection of PFOA or Sum of PFOS and PFHxS, or new exceedance of guideline value were reported at any of the seepage water monitoring locations.

The surface water laboratory results reported the following:

- The surface water monitoring location sampled (SW181) reported all PFAS concentration below the laboratory LOR.
- There was no first-time detection of PFOA or Sum of PFOS and PFHxS at the surface water monitoring location sampled (SW181) during the June 2023 monitoring event.

The sediment laboratory results reported the following:

- No first-time detection of PFOA or the Sum of PFOS and PFHxS above the LOR was reported during the June 2023 monitoring event.

The next OMP sampling event for HEH-B will be the November 2023. An Ongoing Monitoring Interpretive Report will be prepared for the November 2022 – October 2023 monitoring period.

6 References

General References

1. Australian Standard AS 4482-2005 *Guide to the investigation and sampling of sites with potentially contaminated soils*, Part 1 – Non-volatile and semi-volatile compounds.
2. *Contaminated Sites Act 2003*, Western Australia.
3. Department of Defence, May 2021, PFAS OMP Factual Report Guidance Version 0.2.
4. Department of Defence, July 2018 amended August 2019, *Contamination Management Manual*, Annex L *Guidance on Data Management*.
5. Department of the Environment and Energy (2017) in the National Greenhouse and Energy Reporting Scheme Measurement Technical Guidelines for the Estimation of Emissions by Facilities in Australia.
6. Department of Water and Environmental Regulation (DWER), 2021, *Assessment and Management of Contaminated Sites*.
7. Department of Water and Environment Regulation (DWER), 2018, Perth Groundwater Atlas, (https://maps.water.wa.gov.au/#/webmap/gwm).
8. Environmental Protection Agency (United States EPA), November 2002, Reference: EPA/240/R-02/004, '*Guidance on Environmental Data Verification and Data Validation'.*
9. The Heads of EPAs Australia and New Zealand (HEPA; 2020) PFAS National Environmental Management Plan (NEMP) 2.0, January 2020.
10. National Environment Protection Council (NEPC), 1999, National Environmental Protection (Assessment of Site Contamination) Measure (as amended), registered May 2013.
11. National Health and Medical Research Council (NHMRC) (2011, as updated 2018) National Water Quality Management Strategy Australian Drinking Water Guidelines 6, August 2018
12. NHMRC, August 2019, Guidance on Per and Polyfluoroalkyl Substances (PFAS) in Recreational Water.
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29. Cardno, August 2022, PFAS OMP Biannual Monitoring Factual Report, 2022 Post Summer, HEH-B
30. Cardno, September 2022, PFAS OMP First Flush Sampling Event Factual Report, May 2022, HEH-B
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APPENDIX

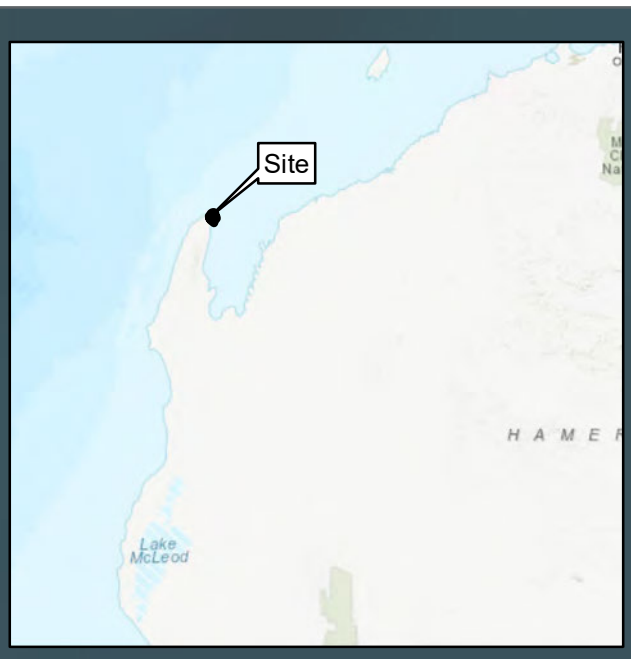
A

FIGURES

Cardno

now

Stantec



North West Cape

Exmouth

Legend

Management Area

Site Boundary

FIGURE 1

1:100,000 Scale at A3

Metres

0 1,500 3,000

Site Location

JUNE 2023 BIANNUAL MONITORING EVENT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-07-13 | Project: DEF19009
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-001_RegionalLocation 01.mxd
Aerial Imagery Supplied by Google Earth

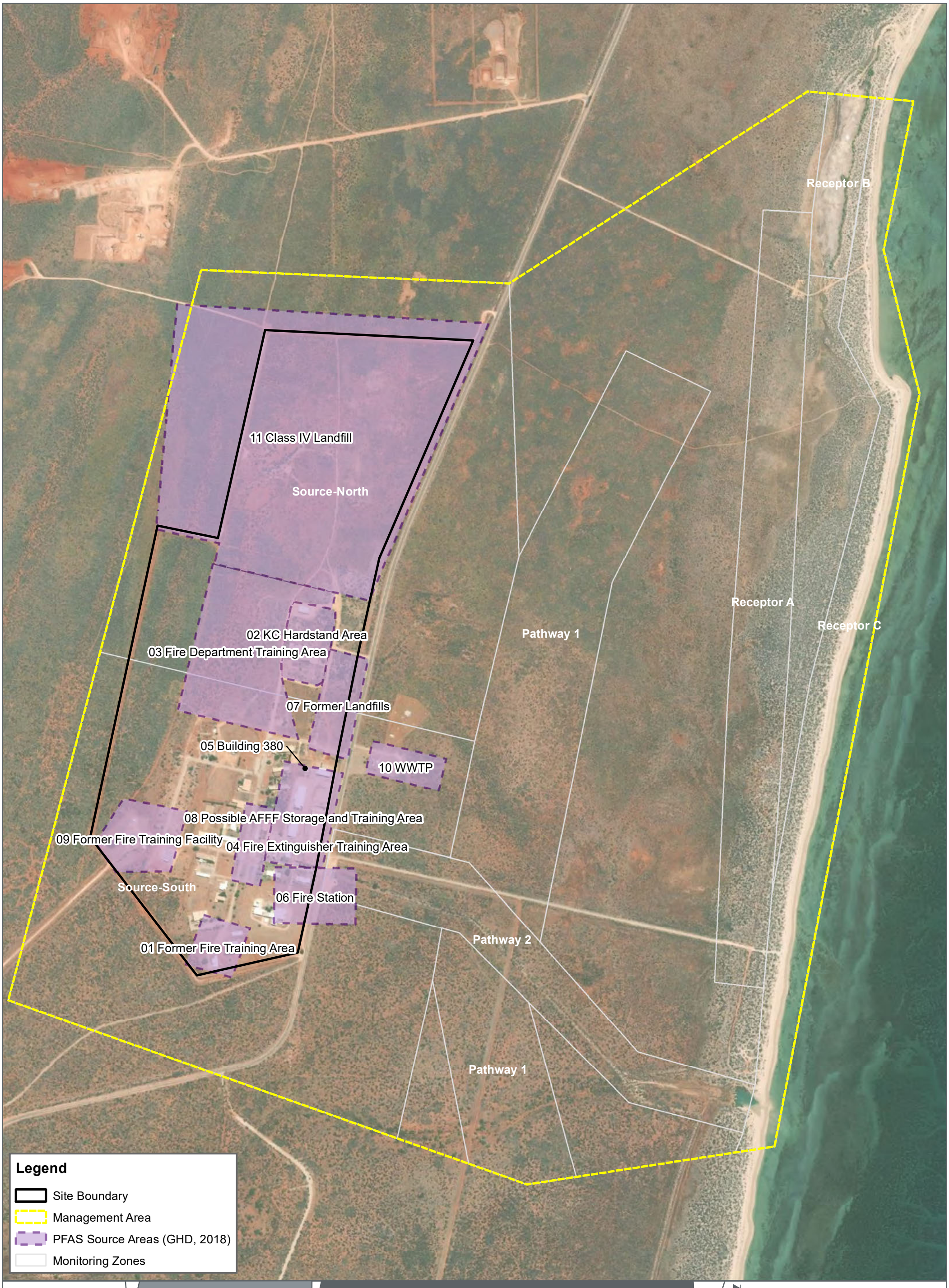


FIGURE 2

1:11,500 Scale at A3

Metres

0 250 500

Management Area

JUNE 2023 BIANNUAL MONITORING EVENT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-07-13 | Project: DEF19009
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-002_ManagementAreas 02.mxd
Aerial Imagery Supplied by Google Earth

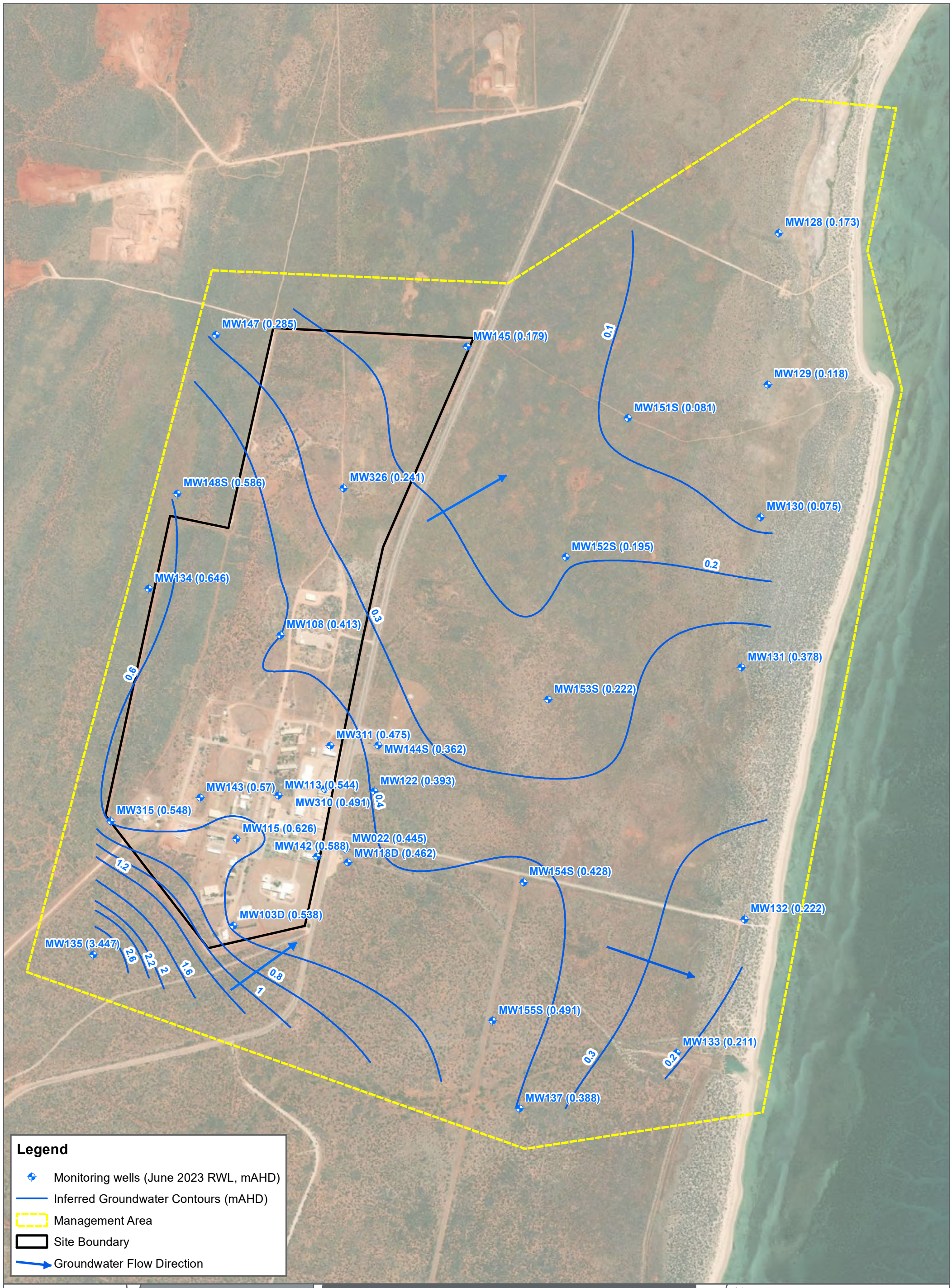


FIGURE 3

1:12,000 Scale at A3

Metres

0 250 500

Inferred Groundwater Contours

JUNE 2023 BIANNUAL MONITORING EVENT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

Cardno

Map Produced by Cardno WA
Date: 2023-07-27 | Project: DEF19009
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-003_GroundwaterContoursNov-22 01.mxd
Aerial Imagery Supplied by Google Earth

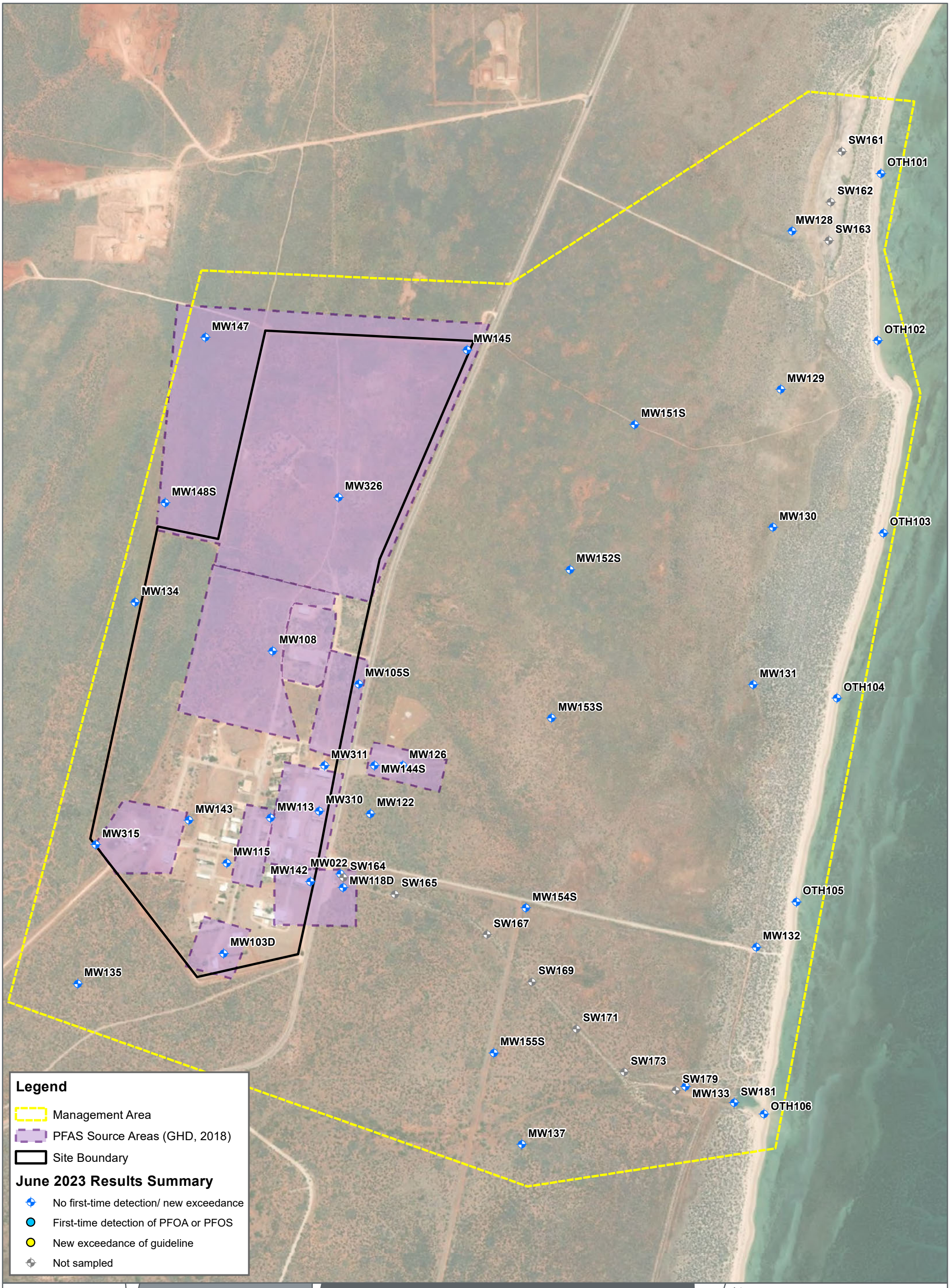


FIGURE 4
1:11,500 Scale at A3
Metres
0 250 500

Monitoring Locations & Results

JUNE 2023 BIANNUAL MONITORING EVENT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-07-27 | Project: DEF19009
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-004_WResults_June23.mxd
Aerial Imagery Supplied by Google Earth

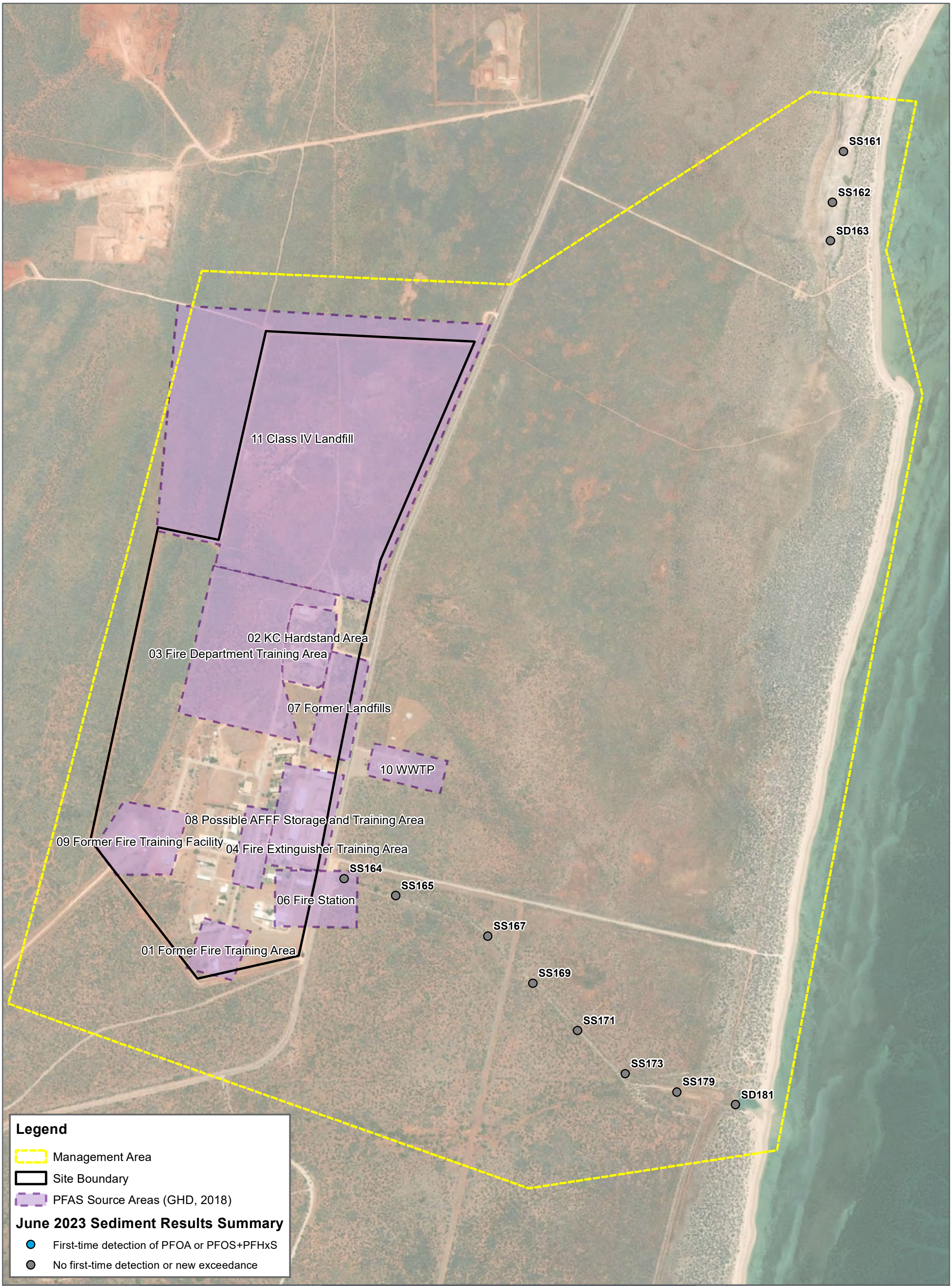


FIGURE 5

1:11,500 Scale at A3

Metres

0 250 500

Sediment Monitoring Locations & Results

JUNE 2023 BIANNUAL MONITORING EVENT
HAROLD E HOLT AREA B
DEPARTMENT OF DEFENCE

N

Cardno

Map Produced by Cardno WA
Date: 2023-07-27 | Project: DEF19009
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Map: DEF19009_WA_0082-GS-005_SResults_Junw232 01.mxd
Aerial Imagery Supplied by Google Earth

APPENDIX

B

DATA ASSESSMENT TABLES

Cardno

now

Stantec

Gardino now Stantec

B1 - Water Sample Analytical Results

PFAS OMP June 2023 Monitoring Event
Nazal Communication Station HEH-B

					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sul			
					Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.05	0.02	0.05
PFAS NEMP 2020 Interim Marine 99%									0.00023*						19														
PFAS NEMP 2020 Recreational Water															**10**														
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report No.**																										
MW022	**26/06/2023**	**0082_MW022_230626**	**Normal**	**EP2308618**	0.03	0.05	0.55	0.03	3.34	<0.02	0.1	0.26	0.30	0.26	0.21	0.16	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW103D	**26/06/2023**	**0082_MW103D_230626**	**Normal**	**EP2308618**	0.22	0.28	2.35	0.12	2.00	<0.02	0.1	0.21	0.56	0.07	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW105S	**26/06/2023**	**0082_MW105S_230626**	**Normal**	**EP2308607**	0.05	0.08	0.74	0.03	5.35	<0.02	0.2	0.25	0.38	0.30	0.25	0.16	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW108	**26/06/2023**	**0082_MW108_230626**	**Normal**	**EP2308607**	<0.02	<0.02	0.14	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW113	**26/06/2023**	**0082_MW113_230626**	**Normal**	**EP2308618**	0.02	<0.02	0.13	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW115	**26/06/2023**	**0082_MW115_230626**	**Normal**	**EP2308618**	0.15	0.23	3.04	0.17	8.66	<0.02	1.0	2.68	2.61	1.48	0.42	0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.49	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW118D	**26/06/2023**	**0082_MW118D_230626**	**Normal**	**EP2308618**	0.32	0.31	1.66	0.27	8.62	<0.02	0.4	0.67	0.93	0.30	0.58	0.14	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	4.35	0.08	<0.05	<0.02	<0.05	<0.02	<0.05
MW122	**26/06/2023**	**0082_MW122_230626**	**Normal**	**EP2308607**	0.12	0.15	0.85	0.02	0.24	<0.02	0.1	0.23	0.27	0.08	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW126	**26/06/2023**	**0082_MW126_230626**	**Normal**	**EP2308607**	<0.02	<0.02	0.14	<0.02	0.30	<0.02	0.4	1.00	0.94	0.27	0.10	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW128	**26/06/2023**	**0082_MW128_3.7-4.2_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW129	**26/06/2023**	**0082_MW129_3.5-4.0_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW130	**26/06/2023**	**0082_MW130_4.9-5.4_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW131	**26/06/2023**	**0082_MW131_4.0-4.5_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW132	**26/06/2023**	**0082_MW132_6.4-6.9_230626**	**Normal**	**EP2308608**	0.03	0.03	0.12	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW133	**26/06/2023**	**0082_MW133_3.0-3.5_230626**	**Normal**	**EP2308618**	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW134	**26/06/2023**	**0082_MW134_6.6-7.1_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW135	**26/06/2023**	**0082_MW135_10.3-10.8_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW137	**26/06/2023**	**0082_MW137_6.1-6.6_230626**	**Normal**	**EP2308618**	<0.02	<0.02	0.01	<0.02	0.06	<0.02	<0.1	0.06	0.06	0.03	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.06	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW142	**26/06/2023**	**0082_MW142_230626**	**Normal**	**EP2308618**	0.07	0.07	0.79	0.13	8.04	<0.02	0.2	0.52	0.49	0.22	0.22	0.06	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	2.13	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW142	**26/06/2023**	**0082_QC103_230626**	**Field Duplicate**	**EP2308618**	0.06	0.06	0.78	0.14	10.7	<0.02	0.2	0.54	0.52	0.24	0.21	0.06	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	2.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW142	**26/06/2023**	**0082_QC203_230626**	**Interlab Duplicate**	**1004374**	0.04	0.06	0.59	0.16	12	<0.01	0.19	0.45	0.42	0.19	0.18	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	2.4	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
MW143	**26/06/2023**	**0082_MW143_230626**	**Normal**	**EP2308618**	0.03	0.04	0.40	0.09	4.70	<0.02	0.4	0.98	0.88	0.71	0.52	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	1.34	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW144S	**26/06/2023**	**0082_MW144S_230626**	**Normal**	**EP2308607**	0.33	0.42	2.77	0.13	6.90	<0.02	0.8	1.87	1.70	1.70	0.88	0.25	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.32	0.12	<0.05	<0.02	<0.05	<0.02	<0.05
MW145	**26/06/2023**	**0082_MW145_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW147	**26/06/2023**	**0082_MW147_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW147	**26/06/2023**	**0082_QC101_230626**	**Field Duplicate**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW147	**26/06/2023**	**0082_QC201_230626**	**Interlab Duplicate**	**1004374**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
MW148S	**26/06/2023**	**0082_MW148S_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW151S	**26/06/2023**	**0082_MW151S_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW152S	**26/06/2023**	**0082_MW152S_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW153S	**26/06/2023**	**0082_MW153S_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW154S	**26/06/2023**	**0082_MW154S_230626**	**Normal**	**EP2308618**	0.21	0.21	0.98	0.05	0.74	<0.02	<0.1	0.21	0.23	0.08	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW155S	**26/06/2023**	**0082_MW155S_230626**	**Normal**	**EP2308618**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW310	**26/06/2023**	**0082_MW310_230626**	**Normal**	**EP2308618**	5.29	6.41	11.1	0.21	2.02	<0.02	3.3	6.93	15.6	2.22	0.31	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	0.58	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW311	**26/06/2023**	**0082_MW311_230626**	**Normal**	**EP2308618**	<0.02	<0.02	0.11	<0.02	0.22	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW315	**26/06/2023**	**0082_MW315_230626**	**Normal**	**EP2308618**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW315	**26/06/2023**	**0082_QC104_230626**	**Field Duplicate**	**EP2308618**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW315	**26/06/2023**	**0082_QC204_230626**	**Interlab Duplicate**	**1004374**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
MW315	**26/06/2023**	**0082_MW315_230626**	**Normal**	**EP2308618**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW315	**26/06/2023**	**0082_QC104_230626**	**Field Duplicate**	**EP2308618**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW315	**26/06/2023**	**0082_QC204_230626**	**Interlab Duplicate**	**1004374**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
MW326	**26/06/2023**	**0082_MW326_230626**	**Normal**	**EP2308607**	<0.02	<0.02	0.07	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW326	**26/06/2023**	**0082_QC102_230626**	**Field Duplicate**	**EP2308607**	<0.02	<0.02	0.06	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
MW326	**26/06/2023**	**0082_QC202_230626**	**Interlab Duplicate**	**1004374**	0.01	<0.01	0.05	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
OTH101	**26/06/2023**	**0082_OTH101_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
OTH102	**26/06/2023**	**0082_OTH102_230626**	**Normal**	**EP2308610**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
OTH103	**26/06/2023**	**0082_OTH103_230626**	**Normal**	**EP2308610**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
OTH104	**26/06/2023**	**0082_OTH104_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
OTH105	**26/06/2023**	**0082_OTH105_230626**	**Normal**	**EP2308610**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
OTH106	**26/06/2023**	**0082_OTH106_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
SW181	**26/06/2023**	**0082_QC107_230626**	**Field Duplicate**	**EP2308620**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05
SW181	**26/06/2023**	**0082_QC207_230626**	**Interlab Duplicate**	**1004374**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05
SW181	**26/06/2023**	**0082_SW181_230626**	**Normal**	**EP2308620**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

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

*Practical screening guideline of 0.01 µg/L adopted based on typical current laboratory limit of reporting (HEPA, 2020)

	Ifonamides				PFAS			Inorganics									Metals			
	Perfluorobutane sulfonic acid (PFBS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Calcium (filtered)	Magnesium (filtered)	Potassium (filtered)	Sodium (filtered)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting	0.01	0.05	0.02	0.05	0.01	0.01	0.01	1	1	1	1	0.01	0.01	1	0.01	1	1	1	1	1
PFAS NEMP 2020 Interim Marine 99%																				
PFAS NEMP 2020 Recreational Water					**2**															

Location Code	Date	Field ID	Sample Type	Lab Report No.																		
MW022	**26/06/2023**	**0082_MW022_230626**	**Normal**	**EP2308618**	0.03	<0.05	<0.02	<0.05	**3.89**	5.05	5.29	<1	380	<1	380	9.01	8.12	40	5.18	14	50	31	20	59
MW103D	**26/06/2023**	**0082_MW103D_230626**	**Normal**	**EP2308618**	0.22	<0.05	<0.02	<0.05	**4.35**	5.57	5.97	<1	141	<1	141	41.8	46.6	1,260	5.43	167	231	129	26	548
MW105S	**26/06/2023**	**0082_MW105S_230626**	**Normal**	**EP2308607**	0.05	<0.05	<0.02	<0.05	**6.09**	7.52	7.79	<1	859	<1	859	29.2	25.5	332	6.89	130	6	32	51	488
MW108	**26/06/2023**	**0082_MW108_230626**	**Normal**	**EP2308607**	<0.02	<0.05	<0.02	<0.05	0.16	0.16	0.16	<1	563	<1	563	109	117	2,910	3.35	758	62	109	94	2,350
MW113	**26/06/2023**	**0082_MW113_230626**	**Normal**	**EP2308618**	0.02	<0.05	<0.02	<0.05	0.17	0.19	0.19	<1	653	<1	653	31.6	28.7	535	4.85	166	15	20	41	580
MW115	**26/06/2023**	**0082_MW115_230626**	**Normal**	**EP2308618**	0.15	<0.05	<0.02	<0.05	**11.7**	20.5	21.0													
MW118D	**26/06/2023**	**0082_MW118D_230626**	**Normal**	**EP2308618**	0.32	<0.05	<0.02	<0.05	**10.3**	17.9	18.6	<1	548	<1	548	41.0	42.3	956	1.59	148	14	25	59	875
MW122	**26/06/2023**	**0082_MW122_230626**	**Normal**	**EP2308607**	0.12	<0.05	<0.02	<0.05	1.09	1.95	2.12	<1	722	<1	722	87.1	97.1	2,130	5.43	603	58	95	77	1,940
MW126	**26/06/2023**	**0082_MW126_230626**	**Normal**	**EP2308607**	<0.02	<0.05	<0.02	<0.05	0.44	3.15	3.17	<1	372	<1	372	12.0	12.1	120	0.66	56	43	29	22	162
MW128	**26/06/2023**	**0082_MW128_3.7-4.2_230626**	**Normal**	**EP2308607**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	243	<1	243	589	689	18,600	7.79	2,870	529	1,510	632	12,000
MW129	**26/06/2023**	**0082_MW129_3.5-4.0_230626**	**Normal**	**EP2308608**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	145	<1	145	552	651	17,600	8.25	2,520	497	1,450	601	11,300
MW130	**26/06/2023**	**0082_MW130_4.9-5.4_230626**	**Normal**	**EP2308608**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	259	<1	259	340	392	10,700	7.22	1,570	321	891	359	6,760
MW131	**26/06/2023**	**0082_MW131_4.0-4.5_230626**	**Normal**	**EP2308607**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	374	<1	374	140	161	4,290	7.16	535	190	304	156	2,820
MW132	**26/06/2023**	**0082_MW132_6.4-6.9_230626**	**Normal**	**EP2308608**	0.03	<0.05	<0.02	<0.05	0.12	0.15	0.18	<1	250	<1	250	429	519	13,500	9.48	2,090	436	1,150	478	8,980
MW133	**26/06/2023**	**0082_MW133_3.0-3.5_230626**	**Normal**	**EP2308618**	<0.02	<0.05	<0.02	<0.05	0.03	0.03	0.03	<1	346	<1	346	506	581	16,000	6.92	2,270	482	1,260	532	10,100
MW134	**26/06/2023**	**0082_MW134_6.6-7.1_230626**	**Normal**	**EP2308608**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	342	<1	342	451	476	14,400	2.66	1,840	558	964	338	8,280
MW135	**26/06/2023**	**0082_MW135_10.3-10.8_230626**	**Normal**	**EP2308608**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	622	<1	622	207	245	5,370	8.34	2,070	109	385	190	4,660
MW137	**26/06/2023**	**0082_MW137_6.1-6.6_230626**	**Normal**	**EP2308618**	<0.02	<0.05	<0.02	<0.05	0.07	1.28	1.28	<1	442	<1	442	204	219	6,320	3.70	794	270	469	143	3,760
MW142	**26/06/2023**	**0082_MW142_230626**	**Normal**	**EP2308618**	0.07	<0.05	<0.02	<0.05	**8.83**	12.7	12.9	<1	436	<1	436	53.5	57.2	1,430	3.34	216	159	133	58	848
MW142	**26/06/2023**	**0082_QC103_230626**	**Field Duplicate**	**EP2308618**	0.06	<0.05	<0.02	<0.05	**11.5**	15.3	15.5	<1	410	<1	410	53.6	59.0	1,450	4.82	215	166	139	61	867
MW142	**26/06/2023**	**0082_QC203_230626**	**Interlab Duplicate**	**1004374**	0.04	<0.05	<0.05	<0.05	**12.59**	16.46	16.75													
MW143	**26/06/2023**	**0082_MW143_230626**	**Normal**	**EP2308618**	0.03	<0.05	<0.02	<0.05	**5.10**	9.96	10.1	<1	440	<1	440	12.6	10.9	105	7.36	40	7	7	33	209
MW144S	**26/06/2023**	**0082_MW144S_230626**	**Normal**	**EP2308607**	0.33	<0.05	<0.02	<0.05	**9.67**	17.4	18.2	<1	545	<1	545	24.5	23.3	400	2.58	113	5	5	26	505
MW145	**26/06/2023**	**0082_MW145_230626**	**Normal**	**EP2308607**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	336	<1	336	538	613	16,900	6.54	2,600	603	1,210	525	10,800
MW147	**26/06/2023**	**0082_MW147_230626**	**Normal**	**EP2308608**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	410	<1	410	363	388	11,500	3.29	1,480	451	826	312	6,660
MW147	**26/06/2023**	**0082_QC101_230626**	**Field Duplicate**	**EP2308608**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	395	<1	395	368	392	11,700	3.12	1,440	476	833	308	6,700
MW147	**26/06/2023**	**0082_QC201_230626**	**Interlab Duplicate**	**1004374**	<0.01	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
MW148S	**26/06/2023**	**0082_MW148S_230626**	**Normal**	**EP2308608**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	415	<1	415	455	504	14,400	5.07	1,960	588	1,040	379	8,720
MW151S	**26/06/2023**	**0082_MW151S_230626**	**Normal**	**EP2308608**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	398	<1	398	586	677	18,500	7.20	2,700	571	1,500	632	11,700
MW152S	**26/06/2023**	**0082_MW152S_230626**	**Normal**	**EP2308608**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	330	<1	330	530	588	16,800	5.19	2,400	574	1,240	556	10,200
MW153S	**26/06/2023**	**0082_MW153S_230626**	**Normal**	**EP2308608**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	333	<1	333	482	565	15,400	7.92	1,980	560	1,210	514	9,760
MW154S	**26/06/2023**	**0082_MW154S_230626**	**Normal**	**EP2308618**	0.21	<0.05	<0.02	<0.05	1.72	2.52	2.78	<1	525	<1	525	273	293	8,310	3.55	1,360	334	609	236	5,070
MW155S	**26/06/2023**	**0082_MW155S_230626**	**Normal**	**EP2308618**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	530	<1	530	245	269	7,470	4.66	1,140	349	582	191	4,570
MW310	**26/06/2023**	**0082_MW310_230626**	**Normal**	**EP2308618**	5.29	<0.05	<0.02	<0.05	**13.1**	47.4	54.0	<1	1,050	<1	1,050	43.2	36.5	536	8.40	342	23	40	52	707
MW311	**26/06/2023**	**0082_MW311_230626**	**Normal**	**EP2308618**	<0.02	<0.05	<0.02	<0.05	0.33	0.34	0.34	<1	174	<1	174	4.76	4.74	30	0.20	21	32	12	18	39
MW315	**26/06/2023**	**0082_MW315_230626**	**Normal**	**EP2308618**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	808	<1	808	17.7	15.1	47	7.99	12	2	3	24	325
MW315	**26/06/2023**	**0082_QC104_230626**	**Field Duplicate**	**EP2308618**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	2	789	<1	791	17.5	15.2	49	6.80	14	2	3	25	328
MW315	**26/06/2023**	**0082_QC204_230626**	**Interlab Duplicate**	**1004374**	<0.01	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
MW326	**26/06/2023**	**0082_MW326_230626**	**Normal**	**EP2308607**	<0.02	<0.05	<0.02	<0.05	0.08	0.09	0.09	<1	501	<1	501	413	445	12,500	3.66	2,440	343	808	314	8,120
MW326	**26/06/2023**	**0082_QC102_230626**	**Field Duplicate**	**EP2308607**	<0.02	<0.05	<0.02	<0.05	0.08	0.09	0.09													
MW326	**26/06/2023**	**0082_QC202_230626**	**Interlab Duplicate**	**1004374**	0.01	<0.05	<0.05	<0.05	0.06	0.08	<0.1													
OTH101	**26/06/2023**	**0082_OTH101_230626**	**Normal**	**EP2308607**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	127	<1	127	582	691	18,500	8.54	2,780	504	1,550	639	12,000
OTH102	**26/06/2023**	**0082_OTH102_230626**	**Normal**	**EP2308610**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	333	<1	333	559	650	17,700	7.50	2,550	467	1,510	587	11,200
OTH103	**26/06/2023**	**0082_OTH103_230626**	**Normal**	**EP2308610**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	274	<1	274	566	672	18,000	8.55	2,550	480	1,500	621	11,700
OTH104	**26/06/2023**	**0082_OTH104_230626**	**Normal**	**EP2308607**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	127	<1	127	575	662	18,300	7.08	2,690	480	1,490	610	11,500
OTH105	**26/06/2023**	**0082_OTH105_230626**	**Normal**	**EP2308610**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	206	<1	206	559	640	17,800	6.76	2,530	462	1,500	584	11,000
OTH106	**26/06/2023**	**0082_OTH106_230626**	**Normal**	**EP2308607**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	125	<1	125	578	650	18,400	5.92	2,700	470	1,460	600	11,300
SW181	**26/06/2023**	**0082_QC107_230626**	**Field Duplicate**	**EP2308620**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	173	<1	173	560	668	17,700	8.77	2,760	486	1,500	614	11,600
SW181	**26/06/2023**	**0082_QC207_230626**	**Interlab Duplicate**	**1004374**	<0.01	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1													
SW181	**26/06/2023**	**0082_SW181_230626**	**Normal**	**EP2308620**	<0.02	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01	<1	173	<1	173	556	679	17,800	9.90	2,440	492	1,570	624	11,700

Environmental Standards
HEPA, January 2020, PFAS NEMP 2020 Interim Marine 99%
HEPA, January 2020, PFAS NEMP 2020 Recreational Water

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

*Practical screening guideline of 0.01 µg/L adopted based on typical current laboratory limit of reporting (HEPA, 2020)

		MC	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids									
		Moisture Content	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)
		%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting		0.1	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**															
SD163	**26/06/2023**	**0082_SD163_230626**	**Normal**	**EP2308609**	25.1	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD181	**26/06/2023**	**0082_SD181_230626**	**Normal**	**EP2308619**	22.7	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS161	**26/06/2023**	**0082_SD161_230626**	**Normal**	**EP2308609**	33.5	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	**26/06/2023**	**0082_SD162_230626**	**Normal**	**EP2308609**	44.7	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS164	**26/06/2023**	**0082_SD164_230626**	**Normal**	**EP2308619**	2.7	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS165	**26/06/2023**	**0082_SS165_230626**	**Normal**	**EP2308619**	1.7	<0.0002	<0.0002	<0.0002	<0.0002	0.0052	0.0003	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS167	**26/06/2023**	**0082_SS167_230626**	**Normal**	**EP2308619**	2.1	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS169	**26/06/2023**	**0082_SS169_230626**	**Normal**	**EP2308619**	0.9	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS171	**26/06/2023**	**0082_SS171_230626**	**Normal**	**EP2308619**	1.0	<0.0002	<0.0002	<0.0002	<0.0002	0.0010	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS173	**26/06/2023**	**0082_SS173_230626**	**Normal**	**EP2308619**	1.8	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS179	**26/06/2023**	**0082_SS179_230626**	**Normal**	**EP2308619**	8.4	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Note:

First-time detection of PFOA or PFOS+PFHxS

		MC		PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
		Moisture Content	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
		%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting		0.1	0.0005	0.0005	0.0005	0.0005	0.0005	0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0002	0.0002	0.0002
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**													
SD163	26/06/2023	0082_SD163_230626	Normal	EP2308609	25.1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD181	26/06/2023	0082_SD181_230626	Normal	EP2308619	22.7	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS161	26/06/2023	0082_SD161_230626	Normal	EP2308609	33.5	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	26/06/2023	0082_SD162_230626	Normal	EP2308609	44.7	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS164	26/06/2023	0082_SD164_230626	Normal	EP2308619	2.7	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0005	0.0005	0.0005
SS165	26/06/2023	0082_SS165_230626	Normal	EP2308619	1.7	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0052	0.0052	0.0055
SS167	26/06/2023	0082_SS167_230626	Normal	EP2308619	2.1	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS169	26/06/2023	0082_SS169_230626	Normal	EP2308619	0.9	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS171	26/06/2023	0082_SS171_230626	Normal	EP2308619	1.0	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0010	0.0010	0.0010
SS173	26/06/2023	0082_SS173_230626	Normal	EP2308619	1.8	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS179	26/06/2023	0082_SS179_230626	Normal	EP2308619	8.4	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

Note:

First-time detection of PFOA or PFOS+PFHxS

				PFAS - Perfluoroalkyl Sulfonic Acids							PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorote	
				Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting				0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05
Date	**Field ID**	**Sample Type**	**Lab Report No.**																				
26/06/2023	**0082_QC301_230626**	**Rinsate**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
26/06/2023	**0082_QC302_230626**	**Rinsate**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
26/06/2023	**0082_QC303_230626**	**Rinsate**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
26/06/2023	**0082_QC401_230626**	**Field Blank**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
26/06/2023	**0082_QC402_230626**	**Field Blank**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05
26/06/2023	**0082_QC403_230626**	**Field Blank**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05

				PFASlomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS		
				Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting				0.01	0.01	0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01	0.01
Date	**Field ID**	**Sample Type**	**Lab Report No.**														
26/06/2023	**0082_QC301_230626**	**Rinsate**	**EP2308607**	<0.02	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
26/06/2023	**0082_QC302_230626**	**Rinsate**	**EP2308607**	<0.02	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
26/06/2023	**0082_QC303_230626**	**Rinsate**	**EP2308607**	<0.02	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
26/06/2023	**0082_QC401_230626**	**Field Blank**	**EP2308607**	<0.02	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
26/06/2023	**0082_QC402_230626**	**Field Blank**	**EP2308607**	<0.02	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01
26/06/2023	**0082_QC403_230626**	**Field Blank**	**EP2308607**	<0.02	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01

Date			26 Jun 2023	26 Jun 2023		26 Jun 2023	26 Jun 2023		26 Jun 2023	26 Jun 2023		26 Jun 2023	26 Jun 2023		26 Jun 2023	26 Jun 2023	
Field ID			0082_MW147_230626	0082_QC101_230626		0082_MW147_230626	0082_QC201_230626		0082_MW142_230626	0082_QC103_230626		0082_MW142_230626	0082_QC203_230626		0082_MW326_230626	0082_QC102_230626	
Matrix Type			Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
Lab Report Number			EP2308608	EP2308608	RPD	EP2308608	1004374	RPD	EP2308618	EP2308618	RPD	EP2308618	1004374	RPD	EP2308607	EP2308607	RPD
	Unit	LOR															
PFAS - Perfluoroalkyl Sulfonic Acids																	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.07	0.06	15	0.07	0.04	55	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.07	0.06	15	0.07	0.06	15	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.79	0.78	1	0.79	0.59	**29**	0.07	0.06	15
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.13	0.14	7	0.13	0.16	21	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	8.04	10.7	**28**	8.04	12	**40**	0.01	0.02	67
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids																	
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.1	<0.1	0	<0.1	<0.05	0	0.2	0.2	0	0.2	0.19	5	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.52	0.54	4	0.52	0.45	14	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.49	0.52	6	0.49	0.42	15	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.22	0.24	9	0.22	0.19	15	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.22	0.21	5	0.22	0.18	20	0.01	0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	0.06	0.06	0	0.06	0.05	18	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	2.13	2.02	5	2.13	2.4	12	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
PFAS - Perfluoroalkyl Sulfonamides																	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																	
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	8.83	11.5	**26**	8.83	12.59	**35**	0.08	0.08	0
Sum of PFAS (WA DER List)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0	12.7	15.3	19	12.7	16.46	**26**	0.09	0.09	0
Sum of PFAS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.1	0	12.9	15.5	18	12.9	16.75	**26**	0.09	0.09	0

**RPDs have only been considered where a concentration is greater than 1 times the LOR.

**Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each LOR multiplier range are: No Limit (1 - 10 x LOR); 50 (10 - 20 x LOR); 20 (> 20 x LOR))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

		26 Jun 2023	26 Jun 2023		26 Jun 2023	26 Jun 2023		26 Jun 2023	26 Jun 2023		26 Jun 2023	26 Jun 2023		26 Jun 2023	26 Jun 2023	
		0082_MW326_230626	0082_QC202_230626		0082_MW315_230626	0082_QC104_230626		0082_MW315_230626	0082_QC204_230626		0082_SW181_230626	0082_QC107_230626		0082_SW181_230626	0082_QC207_230626	
		Water	Water		Water	Water		Water	Water		Water	Water		Water	Water	
		EP2308607	1004374	RPD	EP2308618	EP2308618	RPD	EP2308618	1004374	RPD	EP2308620	EP2308620	RPD	EP2308620	1004374	RPD
	Unit															
PFAS - Perfluoroalkyl Sulfonic Acids																
Perfluorobutane sulfonic acid (PFBS)	µg/L	<0.02	0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.07	0.05	33	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
PFAS - Perfluoroalkyl Carboxylic Acids																
Perfluorobutanoic acid (PFBA)	µg/L	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids																
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
PFAS - Perfluoroalkyl Sulfonamides																
Perfluorooctane sulfonamide (FOSA)	µg/L	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane	µg/L	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0	<0.02	<0.02	0	<0.02	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
PFAS																
Sum of PFHxS and PFOS	µg/L	0.08	0.06	29	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Sum of PFAS (WA DER List)	µg/L	0.09	0.08	12	<0.01	<0.01	0	<0.01	<0.05	0	<0.01	<0.01	0	<0.01	<0.05	0
Sum of PFAS	µg/L	0.09	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0	<0.01	<0.01	0	<0.01	<0.1	0

*RPDs have only been considered where a concentration

**Elevated RPDs are highlighted as per QAQC Profile sett

***Interlab Duplicates are matched on a per compound b

		Date	26 Jun 2023	26 Jun 2023		26 Jun 2023	26 Jun 2023		26 Jun 2023	26 Jun 2023		26 Jun 2023
		Field ID	0082_SD164_230626	0082_QC105_230626		0082_SD164_230626	0082_QC205_230626		0082_SD162_230626	0082_QC106_230626		0082_SD162_230626
		Matrix Type	Soil	Soil		Soil	Soil		Soil	Soil		Soil
		Lab Report Number	EP2308619	EP2308619	RPD	EP2308619	1004374	RPD	EP2308609	EP2308609	RPD	EP2308609
	Unit	LOR										
PFAS - Perfluoroalkyl Sulfonic Acids												
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	0.0005	0.0004	22	0.0005	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorodecane sulfonic acid (PFDS)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
PFAS - Perfluoroalkyl Carboxylic Acids												
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.005	0	<0.001	<0.001	0	<0.001
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
PFAS - (n:2) Fluorotelomer Sulfonic Acids												
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.01	0	<0.0005	<0.0005	0	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
PFAS - Perfluoroalkyl Sulfonamides												
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.005	0	<0.0002	<0.0002	0	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.01	0	<0.0002	<0.0002	0	<0.0002
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.0005	0	<0.0005
PFAS												
Sum of PFHxS and PFOS	mg/kg	0.0002	0.0005	0.0004	22	0.0005	<0.005	0	<0.0002	<0.0002	0	<0.0002
Sum of PFAS (WA DER List)	mg/kg	0.0002	0.0005	0.0004	22	0.0005	<0.01	0	<0.0002	<0.0002	0	<0.0002
Sum of PFAS	mg/kg	0.0002	0.0005	0.0004	22	0.0005	<0.05	0	<0.0002	<0.0002	0	<0.0002

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

		26 Jun 2023 0082_QC206_230626 Soil 1004374	RPD
	Unit		
PFAS - Perfluoroalkyl Sulfonic Acids			
Perfluorobutane sulfonic acid (PFBS)	mg/kg	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	<0.005	0
Perfluorodecane sulfonic acid (PFDS)	mg/kg	<0.005	0
PFAS - Perfluoroalkyl Carboxylic Acids			
Perfluorobutanoic acid (PFBA)	mg/kg	<0.005	0
Perfluoropentanoic acid (PFPeA)	mg/kg	<0.005	0
Perfluorohexanoic acid (PFHxA)	mg/kg	<0.005	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	<0.005	0
Perfluorooctanoic acid (PFOA)	mg/kg	<0.005	0
Perfluorononanoic acid (PFNA)	mg/kg	<0.005	0
Perfluorodecanoic acid (PFDA)	mg/kg	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	<0.005	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	<0.005	0
PFAS - (n:2) Fluorotelomer Sulfonic Acids			
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	mg/kg	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	<0.005	0
PFAS - Perfluoroalkyl Sulfonamides			
Perfluorooctane sulfonamide (FOSA)	mg/kg	<0.005	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	<0.01	0
N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	<0.005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	<0.005	0
PFAS			
Sum of PFHxS and PFOS	mg/kg	<0.005	0
Sum of PFAS (WA DER List)	mg/kg	<0.01	0
Sum of PFAS	mg/kg	<0.05	0

*RPDs have only been considered where a concentratio
**Elevated RPDs are highlighted as per QAQC Profile se
***Interlab Duplicates are matched on a per compound

APPENDIX

C

LABORATORY CERTIFICATES

Cardno

now

Stantec

00903KBJ54

eurofins | mgt

☐ **Sydney**
Unit F3 - 6 Building F, 16 Mars Road, Lane Cove
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Email: enviro.syd@mgtlabmark.com.au

☐ **Brisbane**
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☐ **Melbourne**
2 Kingston Town Close, Oakleigh, VIC 3166
Phone: +613 8564 5000 Fax: +613 8564 5090
Email: enquiries.melb@mgtlabmark.com.au

CHAIN OF CUSTODY RECORD

CLIENT DETAILS

Company Name : Stantec Australia	Contact Name : [redacted]	Purchase Order : PFAS-OMP 304700525	COC Number : AS-OMP 304700525 -01
Office Address : 226 Adelaide Tce, Perth, WA, 6000		PROJECT Number : WA_0082_PFASOMP_23	Eurofins | mgt quote ID : NA
[redacted]		PROJECT Name : WA_0082_PFASOMP_23	Data output format: PDF; ESDAT

Special Directions & Comments :
Please send ESdat files to derp.labreports@esdat.com.au with the project No in the header file

Please send email invoice to claire.armstrong@stantec.com; SAPinvoices@stantec.com

Eurofins | mgt DI water batch number:

	Sample ID	Date	Matrix	PFAS (28 analytes)
1	0082_QC201_230626	26/06/2023	Water	X
2	0082_QC202_230626	26/06/2023	Water	X
3	0082_QC203_230626	26/06/2023	Water	X
4	0082_QC204_230626	26/06/2023	Water	X
5	0082_QC205_230626	26/06/2023	Soil	X
6	0082_QC206_230626	26/06/2023	Soil	X
7	0082_QC207_230626	26/06/2023	Water	X
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				

Analytes

Some common holding times (with correct preservation).
For further information contact the lab

Waters		Soils	
BTEX, MAH, VOC	14 days	BTEX, MAH, VOC	14 days
TRH, PAH, Phenols, Pesticides	7 days	TRH, PAH, Phenols, Pesticides	14 days
Heavy Metals	6 months	Heavy Metals	6 months
Mercury, CrVI	28 days	Mercury, CrVI	28 days
Microbiological testing	24 hours	Microbiological testing	72 hours
BOD, Nitrate, Nitrite, Total N	2 days	Anions	28 days
Solids - TSS, TDS etc	7 days	SPOCAS, pH Field and FOX, CrS	24 hours
Ferrous iron	7 days	ASLP, TCLP	7 days

Containers:

1LP	250P	125P	1LA	40mL vial	125mL A	Jar	

Sample comments:

Relinquished By:
Stantec

Date & Time :
29/06/2023

Signature:

[redacted]

Turn around time

☐ DAY ☐ 2 DAY ☐ 3 DAY ☐

STANDARD ☑ Other:

Method Of Shipment

☑ Courier
☐ Hand Delivered
☐ Postal

Courier Consignment # : 00903KBJ54

Temperature on arrival:

Report number:
1004374

www.eurofins.com.au EnviroSales@eurofins.com

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NATA# 2377 Site# 2370

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NATA# 1261 Site# 18217

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NATA# 1261 Site# 25466

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NATA# 1261 Site# 20794

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NATA# 1261
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Christchurch
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Christchurch 7675
Tel: +64 3 343 5201
IANZ# 1290

Sample Receipt Advice

Company name:	Stantec Australia Pty Ltd (WA)
Contact name:	[redacted]
Project name:	WA_0082_PFASOMP_23
Project ID:	WA_0082_PFASOMP_23
Turnaround time:	5 Day
Date/Time received	Jun 30, 2023 9:15 AM
Eurofins reference	1004374

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

[redacted] **on phone : or by email:** [redacted]**eurofins.com**

Results will be delivered electronically via email to [redacted] - [redacted]stantec.com.

Note: A copy of these results will also be delivered to the general Stantec Australia Pty Ltd (WA) email address.

Global Leader - Results you can trust

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Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0082_PFASOMP_23
Project ID: WA_0082_PFASOMP_23

Order No.: PFAS-OMP 304700525
Report #: 1004374
Phone: 0458 839 200
Fax:

Received: Jun 30, 2023 9:15 AM
Due: Jul 7, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370						X		X
Melbourne Laboratory - NATA # 1261 Site # 1254							X	
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	0082_QC201_230626	Jun 26, 2023		Water	L23-JI0002185		X	
2	0082_QC02_230626	Jun 26, 2023		Water	L23-JI0002186		X	
3	0082_QC203_230626	Jun 26, 2023		Water	L23-JI0002187		X	
4	0082_QC204_230626	Jun 26, 2023		Water	L23-JI0002188		X	
5	0082_QC205_230626	Jun 26, 2023		Soil	L23-JI0002189	X		X
6	0082_QC206_230626	Jun 26, 2023		Soil	L23-JI0002190	X		X
7	0082_QC207_230626	Jun 26, 2023		Water	L23-JI0002191		X	

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IANZ# 1290

Company Name: Stantec Australia Pty Ltd (WA)
Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0082_PFASOMP_23
Project ID: WA_0082_PFASOMP_23

Order No.: PFAS-OMP 304700525
Report #: 1004374
Phone: 0458 839 200
Fax:

Received: Jun 30, 2023 9:15 AM
Due: Jul 7, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)	PFAS (Full Suite) Soil
Perth Laboratory - NATA # 2377 Site # 2370	X		X
Melbourne Laboratory - NATA # 1261 Site # 1254		X	
External Laboratory			
Test Counts	2	5	2

Stantec Australia Pty Limited
6F 226,Adelaide Terrace
Perth
WA 6000

NATA Accredited
Accreditation Number 2377
Site Number 2370

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: [redacted]

Report **1004374-S**
Project name WA_0082_PFASOMP_23
Project ID WA_0082_PFASOMP_23
Received Date Jun 30, 2023

Client Sample ID			**0082_QC205_230626**	**0082_QC206_230626**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**L23-JI0002189**	**L23-JI0002190**
Date Sampled			**Jun 26, 2023**	**Jun 26, 2023**
Test/Reference	LOR	Unit		
Sample Properties				
% Moisture	1	%	3.1	37
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5
13C4-PFBA (surr.)	1	%	93	61
13C5-PFPeA (surr.)	1	%	99	78
13C5-PFHxA (surr.)	1	%	105	85
13C4-PFHpA (surr.)	1	%	102	88
13C8-PFOA (surr.)	1	%	101	88
13C5-PFNA (surr.)	1	%	108	95
13C6-PFDA (surr.)	1	%	123	104
13C2-PFUnDA (surr.)	1	%	120	101
13C2-PFDoDA (surr.)	1	%	129	108
13C2-PFTeDA (surr.)	1	%	105	91
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10

Client Sample ID			0082_QC205_230626	0082_QC206_230626
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**L23-JI0002189**	**L23-JI0002190**
Date Sampled			**Jun 26, 2023**	**Jun 26, 2023**
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonamido substances				
13C8-FOSA (surr.)	1	%	94	87
D3-N-MeFOSA (surr.)	1	%	98	83
D5-N-EtFOSA (surr.)	1	%	107	94
D7-N-MeFOSE (surr.)	1	%	115	81
D9-N-EtFOSE (surr.)	1	%	105	76
D5-N-EtFOSAA (surr.)	1	%	110	70
D3-N-MeFOSAA (surr.)	1	%	96	71
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5
13C3-PFBS (surr.)	1	%	112	105
18O2-PFHxS (surr.)	1	%	115	101
13C8-PFOS (surr.)	1	%	101	93
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	99	72
13C2-6:2 FTSA (surr.)	1	%	103	85
13C2-8:2 FTSA (surr.)	1	%	101	90
13C2-10:2 FTSA (surr.)	1	%	124	119
PFASs Summations				
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Jul 03, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Jul 06, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Jul 06, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Jul 06, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Jul 06, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Jul 04, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Address: 6F 226,Adelaide Terrace
Perth
WA 6000

Project Name: WA_0082_PFASOMP_23
Project ID: WA_0082_PFASOMP_23

Order No.: PFAS-OMP 304700525
Report #: 1004374
Phone: 0458 839 200
Fax:

Received: Jun 30, 2023 9:15 AM
Due: Jul 7, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0082_QC201_230626	Jun 26, 2023		Water	L23-JI0002185		X
2	0082_QC02_230626	Jun 26, 2023		Water	L23-JI0002186		X
3	0082_QC203_230626	Jun 26, 2023		Water	L23-JI0002187		X
4	0082_QC204_230626	Jun 26, 2023		Water	L23-JI0002188		X
5	0082_QC205_230626	Jun 26, 2023		Soil	L23-JI0002189	X	X
6	0082_QC206_230626	Jun 26, 2023		Soil	L23-JI0002190	X	X
7	0082_QC207_230626	Jun 26, 2023		Water	L23-JI0002191		X
Test Counts						2	7

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**µg/L:** micrograms per litre
ppm: parts per million	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	85			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	73			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	86			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	85			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	88			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	91			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	93			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	102			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	92			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	102			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	81			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	85			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	94			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	83			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	83			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	82			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	83			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	83			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	71			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	92			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	66			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	70			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	75			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	85			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	82			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	96			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	78			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	80			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	82			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L23-JI0002362	NCP	%	93			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L23-JI0002362	NCP	%	82			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L23-JI0002362	NCP	%	96			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L23-JI0002362	NCP	%	90			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L23-JI0002362	NCP	%	96			50-150	Pass	
Perfluorononanoic acid (PFNA)	L23-JI0002362	NCP	%	97			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L23-JI0002362	NCP	%	98			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L23-JI0002362	NCP	%	106			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L23-JI0002362	NCP	%	99			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L23-JI0002362	NCP	%	108			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L23-JI0002362	NCP	%	93			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	L23-JI0002362	NCP	%	91			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L23-JI0002362	NCP	%	95			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L23-JI0002362	NCP	%	86			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L23-JI0002362	NCP	%	91			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L23-JI0002362	NCP	%	89			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L23-JI0002362	NCP	%	88			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L23-JI0002362	NCP	%	93			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L23-JI0002362	NCP	%	77			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	L23-JI0002362	NCP	%	95			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L23-JI0002362	NCP	%	70			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L23-JI0002362	NCP	%	74			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L23-JI0002362	NCP	%	80			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L23-JI0002362	NCP	%	89			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	L23-JI0002362	NCP	%	85			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L23-JI0002362	NCP	%	96			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L23-JI0002362	NCP	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L23-JI0002362	NCP	%	87			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L23-JI0002362	NCP	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L23-JI0002362	NCP	%	91			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-JI0014334	NCP	%	20	20	3.0	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L23-JI0002360	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L23-JI0002360	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	L23-JI0002360	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L23-JI0002360	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager
[redacted] Senior Analyst-PFAS
[redacted] Senior Analyst-Sample Properties

[redacted]
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

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NATA Accredited
Accreditation Number 2377
Site Number 2370

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Attention: [redacted]

Report **1004374-W-V2**
Project name WA_0082_PFASOMP_23
Project ID WA_0082_PFASOMP_23
Received Date Jun 30, 2023

Client Sample ID			**0082_QC201_230626**	**0082_QC202_230626**	**0082_QC203_230626**	**0082_QC204_230626**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**L23-JI0002185**	**L23-JI0002186**	**L23-JI0002187**	**L23-JI0002188**
Date Sampled			**Jun 26, 2023**	**Jun 26, 2023**	**Jun 26, 2023**	**Jun 26, 2023**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	0.19	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	0.45	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	0.42	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]0.19	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	[N09]0.01	[N09]0.18	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	[N09]0.05	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	69	72	73	43
13C5-PFPeA (surr.)	1	%	117	113	92	126
13C5-PFHxA (surr.)	1	%	99	106	93	129
13C4-PFHpA (surr.)	1	%	91	91	87	120
13C8-PFOA (surr.)	1	%	101	103	96	135
13C5-PFNA (surr.)	1	%	125	99	125	147
13C6-PFDA (surr.)	1	%	101	77	100	115
13C2-PFUnDA (surr.)	1	%	81	50	94	100
13C2-PFDoDA (surr.)	1	%	85	46	95	100
13C2-PFTeDA (surr.)	1	%	81	48	108	120
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	111	53	130	124
D3-N-MeFOSA (surr.)	1	%	57	51	193	121

Client Sample ID			0082_QC201_230626	0082_QC202_230626	0082_QC203_230626	0082_QC204_230626
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			L23-JI0002185	L23-JI0002186	L23-JI0002187	L23-JI0002188
Date Sampled			Jun 26, 2023	Jun 26, 2023	Jun 26, 2023	Jun 26, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	58	44	165	91
D7-N-MeFOSE (surr.)	1	%	77	35	175	115
D9-N-EtFOSE (surr.)	1	%	81	35	152	112
D5-N-EtFOSAA (surr.)	1	%	72	40	71	80
D3-N-MeFOSAA (surr.)	1	%	100	64	108	122
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	[N09]0.01	[N09]0.04	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	0.02	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	[N09]0.06	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	[N09]0.05	[N09]0.59	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	[N09]0.16	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	[N09]0.01	[N09]12	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	106	106	110	133
18O2-PFHxS (surr.)	1	%	107	104	83	127
13C8-PFOS (surr.)	1	%	106	87	94	134
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	2.4	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	76	94	83	99
13C2-6:2 FTSA (surr.)	1	%	71	88	66	111
13C2-8:2 FTSA (surr.)	1	%	85	84	69	81
13C2-10:2 FTSA (surr.)	1	%	83	53	80	92
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	0.06	12.59	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	0.02	12.18	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	0.07	12.77	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	0.08	16.46	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	16.75	< 0.1

Client Sample ID			0082_QC207_230626
Sample Matrix			Water
Eurofins Sample No.			L23-JI0002191
Date Sampled			Jun 26, 2023
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01

Client Sample ID			0082_QC207_230626
Sample Matrix			**Water**
Eurofins Sample No.			**L23-JI0002191**
Date Sampled			**Jun 26, 2023**
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01
13C4-PFBA (surr.)	1	%	65
13C5-PFPeA (surr.)	1	%	126
13C5-PFHxA (surr.)	1	%	141
13C4-PFHpA (surr.)	1	%	116
13C8-PFOA (surr.)	1	%	125
13C5-PFNA (surr.)	1	%	92
13C6-PFDA (surr.)	1	%	42
13C2-PFUnDA (surr.)	1	%	25
13C2-PFDoDA (surr.)	1	%	17
13C2-PFTeDA (surr.)	1	%	11
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05
13C8-FOSA (surr.)	1	%	77
D3-N-MeFOSA (surr.)	1	%	78
D5-N-EtFOSA (surr.)	1	%	46
D7-N-MeFOSE (surr.)	1	%	42
D9-N-EtFOSE (surr.)	1	%	32
D5-N-EtFOSAA (surr.)	1	%	20
D3-N-MeFOSAA (surr.)	1	%	38
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01
13C3-PFBS (surr.)	1	%	137
18O2-PFHxS (surr.)	1	%	122
13C8-PFOS (surr.)	1	%	71

Client Sample ID			0082_QC207_230626
Sample Matrix			**Water**
Eurofins Sample No.			**L23-JI0002191**
Date Sampled			**Jun 26, 2023**
Test/Reference	LOR	Unit	
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01
13C2-4:2 FTSA (surr.)	1	%	122
13C2-6:2 FTSA (surr.)	1	%	120
13C2-8:2 FTSA (surr.)	1	%	37
13C2-10:2 FTSA (surr.)	1	%	15
PFASs Summations			
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Jul 06, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Jul 06, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Jul 06, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Jul 06, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Jul 03, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Project Name: WA_0082_PFASOMP_23
Project ID: WA_0082_PFASOMP_23

Order No.: PFAS-OMP 304700525
Report #: 1004374
Phone: 0458 839 200
Fax:

Received: Jun 30, 2023 9:15 AM
Due: Jul 7, 2023
Priority: 5 Day
Contact Name: [redacted]

Eurofins Analytical Services Manager : [redacted]

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	0082_QC201_230626	Jun 26, 2023		Water	L23-JI0002185		X
2	0082_QC02_230626	Jun 26, 2023		Water	L23-JI0002186		X
3	0082_QC203_230626	Jun 26, 2023		Water	L23-JI0002187		X
4	0082_QC204_230626	Jun 26, 2023		Water	L23-JI0002188		X
5	0082_QC205_230626	Jun 26, 2023		Soil	L23-JI0002189	X	X
6	0082_QC206_230626	Jun 26, 2023		Soil	L23-JI0002190	X	X
7	0082_QC207_230626	Jun 26, 2023		Water	L23-JI0002191		X
Test Counts						2	7

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	84			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	80			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	87			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	84			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	88			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	89			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	75			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	87			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	88			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	138			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	85			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	73			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	84			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	72			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	81			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	83			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	85			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	94			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	72			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	81			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	69			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	75			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	78			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	91			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	84			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	62			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	80			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	81			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	90			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluoroheptanesulfonic acid (PFHpS)	M23-JI0003901	NCP	%	96			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-JI0003901	NCP	%	88			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-JI0003901	NCP	%	89			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	L23-JI0002187	CP	%	88			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	L23-JI0002187	CP	%	135			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	L23-JI0002187	CP	%	147			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	L23-JI0002187	CP	%	107			50-150	Pass	
Perfluorooctanoic acid (PFOA)	L23-JI0002187	CP	%	100			50-150	Pass	
Perfluorononanoic acid (PFNA)	L23-JI0002187	CP	%	85			50-150	Pass	
Perfluorodecanoic acid (PFDA)	L23-JI0002187	CP	%	65			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	L23-JI0002187	CP	%	78			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	L23-JI0002187	CP	%	78			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	L23-JI0002187	CP	%	120			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	L23-JI0002187	CP	%	76			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctane sulfonamide (FOSA)	L23-JI0002187	CP	%	67			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	L23-JI0002187	CP	%	64			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	L23-JI0002187	CP	%	56			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	L23-JI0002187	CP	%	72			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	L23-JI0002187	CP	%	71			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	L23-JI0002187	CP	%	75			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	L23-JI0002187	CP	%	81			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	L23-JI0002187	CP	%	71			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	L23-JI0002187	CP	%	123			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	L23-JI0002187	CP	%	71			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	L23-JI0002187	CP	%	92			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	L23-JI0002187	CP	%	136			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	L23-JI0002187	CP	%	98			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	L23-JI0002187	CP	%	71			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	L23-JI0002187	CP	%	72			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	L23-JI0002187	CP	%	78			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-JI0011013	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-JI0011013	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-JI0011013	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-JI0011013	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-JI0011013	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-JI0011013	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-JI0011013	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-JI0011013	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-JI0011013	NCP	ug/L	0.02	0.02	7.5	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-JI0011013	NCP	ug/L	0.19	0.23	21	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-JI0011013	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-JI0011013	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

v2 report issued with corrected sample ID for sample L23-Jl0002186 as per COC.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

[redacted] Analytical Services Manager

[redacted] Senior Analyst-PFAS

[redacted]

General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

CERTIFICATE OF ANALYSIS

Work Order	: **EP2308607**	Page	: 1 of 16
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023 11:20
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 29-Jun-2023
C-O-C number	: 53955	Issue Date	: 07-Jul-2023 17:24
Sampler	: [redacted]		
Site	: HEHB GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 19		
No. of samples analysed	: 19		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Thomas Donovan	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- ED037-P (Alkalinity): Samples EP2308607-7 and 10 were centrifuged before analysis to reduce possible interference from sediment which may consume the alkalinity titrant.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW108_230626	0082_MW326_230626	0082_QC102_230626	0082_MW145_230626	0082_MW126_230626
				Sampling date / time	26-Jun-2023 09:58	26-Jun-2023 10:18	26-Jun-2023 10:19	26-Jun-2023 10:36	26-Jun-2023 11:07
Compound	CAS Number	LOR	Unit		EP2308607-001	EP2308607-002	EP2308607-003	EP2308607-004	EP2308607-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**563**	**501**	----	**336**	**372**
Total Alkalinity as CaCO3	----	1	mg/L		**563**	**501**	----	**336**	**372**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**758**	**2440**	----	**2600**	**56**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**2910**	**12500**	----	**16900**	**120**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**62**	**343**	----	**603**	**43**
Magnesium	7439-95-4	1	mg/L		**109**	**808**	----	**1210**	**29**
Sodium	7440-23-5	1	mg/L		**2350**	**8120**	----	**10800**	**162**
Potassium	7440-09-7	1	mg/L		**94**	**314**	----	**525**	**22**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**109**	**413**	----	**538**	**12.0**
ø Total Cations	----	0.01	meq/L		**117**	**445**	----	**613**	**12.1**
ø Ionic Balance	----	0.01	%		**3.35**	**3.66**	----	**6.54**	**0.66**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.14**	**0.07**	**0.06**	<0.01	**0.14**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.02**	**0.01**	**0.02**	<0.01	**0.30**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	**0.4**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**1.00**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.94**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW108_230626	0082_MW326_230626	0082_QC102_230626	0082_MW145_230626	0082_MW126_230626
				Sampling date / time	26-Jun-2023 09:58	26-Jun-2023 10:18	26-Jun-2023 10:19	26-Jun-2023 10:36	26-Jun-2023 11:07
Compound	CAS Number	LOR	Unit		EP2308607-001	EP2308607-002	EP2308607-003	EP2308607-004	EP2308607-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.27**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.01**	**0.01**	<0.01	**0.10**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.02**
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW108_230626	0082_MW326_230626	0082_QC102_230626	0082_MW145_230626	0082_MW126_230626
				Sampling date / time	26-Jun-2023 09:58	26-Jun-2023 10:18	26-Jun-2023 10:19	26-Jun-2023 10:36	26-Jun-2023 11:07
Compound	CAS Number	LOR	Unit		EP2308607-001	EP2308607-002	EP2308607-003	EP2308607-004	EP2308607-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**0.16**	**0.09**	**0.09**	<0.01	**3.17**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.16**	**0.08**	**0.08**	<0.01	**0.44**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.16**	**0.09**	**0.09**	<0.01	**3.15**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	**98.1**	**108**	**101**	**102**
13C8-PFOA	----	0.02	%		**98.9**	**102**	**102**	**95.6**	**106**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0082_MW122_230626	0082_MW105S_230626	0082_MW144S_230626	0082_OTH101_230626	0082_MW128_3.7-4.2_230626
				Sampling date / time	26-Jun-2023 11:26	26-Jun-2023 11:48	26-Jun-2023 12:52	26-Jun-2023 13:55	26-Jun-2023 14:21
					EP2308607-006	EP2308607-007	EP2308607-008	EP2308607-009	EP2308607-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**722**	**859**	**545**	**127**	**243**
Total Alkalinity as CaCO3	----	1	mg/L		**722**	**859**	**545**	**127**	**243**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**603**	**130**	**113**	**2780**	**2870**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**2130**	**332**	**400**	**18500**	**18600**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**58**	**6**	**5**	**504**	**529**
Magnesium	7439-95-4	1	mg/L		**95**	**32**	**5**	**1550**	**1510**
Sodium	7440-23-5	1	mg/L		**1940**	**488**	**505**	**12000**	**12000**
Potassium	7440-09-7	1	mg/L		**77**	**51**	**26**	**639**	**632**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**87.1**	**29.2**	**24.5**	**582**	**589**
ø Total Cations	----	0.01	meq/L		**97.1**	**25.5**	**23.3**	**691**	**689**
ø Ionic Balance	----	0.01	%		**5.43**	**6.89**	**2.58**	**8.54**	**7.79**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.12**	**0.05**	**0.33**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.15**	**0.08**	**0.42**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.85**	**0.74**	**2.77**	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.02**	**0.03**	**0.13**	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.24**	**5.35**	**6.90**	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.1**	**0.2**	**0.8**	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.23**	**0.25**	**1.87**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.27**	**0.38**	**1.70**	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW122_230626	0082_MW105S_230626	0082_MW144S_230626	0082_OTH101_230626	0082_MW128_3.7-4.2_230626
				Sampling date / time	26-Jun-2023 11:26	26-Jun-2023 11:48	26-Jun-2023 12:52	26-Jun-2023 13:55	26-Jun-2023 14:21
Compound	CAS Number	LOR	Unit		EP2308607-006	EP2308607-007	EP2308607-008	EP2308607-009	EP2308607-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.08**	**0.30**	**1.70**	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.06**	**0.25**	**0.88**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.16**	**0.25**	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	**0.32**	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW122_230626	0082_MW105S_230626	0082_MW144S_230626	0082_OTH101_230626	0082_MW128_3.7-4.2_230626
				Sampling date / time	26-Jun-2023 11:26	26-Jun-2023 11:48	26-Jun-2023 12:52	26-Jun-2023 13:55	26-Jun-2023 14:21
Compound	CAS Number	LOR	Unit		EP2308607-006	EP2308607-007	EP2308607-008	EP2308607-009	EP2308607-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	**0.12**	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**2.12**	**7.79**	**18.2**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.09**	**6.09**	**9.67**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.95**	**7.52**	**17.4**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**109**	**94.7**	**96.5**	**98.2**	**95.4**
13C8-PFOA	----	0.02	%		**103**	**98.8**	**105**	**97.2**	**94.6**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW131_4.0-4.5_230626	0082_OTH104_230626	0082_OTH106_230626	----	----
				Sampling date / time	26-Jun-2023 14:59	26-Jun-2023 15:09	26-Jun-2023 15:26	----	----
Compound	CAS Number	LOR	Unit		EP2308607-011	EP2308607-012	EP2308607-013	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**374**	**127**	**125**	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**374**	**127**	**125**	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**535**	**2690**	**2700**	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**4290**	**18300**	**18400**	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**190**	**480**	**470**	----	----
Magnesium	7439-95-4	1	mg/L		**304**	**1490**	**1460**	----	----
Sodium	7440-23-5	1	mg/L		**2820**	**11500**	**11300**	----	----
Potassium	7440-09-7	1	mg/L		**156**	**610**	**600**	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**140**	**575**	**578**	----	----
ø Total Cations	----	0.01	meq/L		**161**	**662**	**650**	----	----
ø Ionic Balance	----	0.01	%		**7.16**	**7.08**	**5.92**	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW131_4.0-4.5_230626	0082_OTH104_230626	0082_OTH106_230626	----	----
				Sampling date / time	26-Jun-2023 14:59	26-Jun-2023 15:09	26-Jun-2023 15:26	----	----
Compound	CAS Number	LOR	Unit		EP2308607-011	EP2308607-012	EP2308607-013	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW131_4.0-4.5_230626	0082_OTH104_230626	0082_OTH106_230626	----	----
				Sampling date / time	26-Jun-2023 14:59	26-Jun-2023 15:09	26-Jun-2023 15:26	----	----
Compound	CAS Number	LOR	Unit		EP2308607-011	EP2308607-012	EP2308607-013	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**91.7**	**99.9**	**92.3**	----	----
13C8-PFOA	----	0.02	%		**94.1**	**97.1**	**97.0**	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0082_QC301_230626	0082_QC302_230626	0082_QC303_230626	0082_QC401_230626	0082_QC402_230626
				Sampling date / time	26-Jun-2023 15:56	26-Jun-2023 15:57	26-Jun-2023 15:58	26-Jun-2023 15:59	26-Jun-2023 15:59
Compound	CAS Number	LOR	Unit		EP2308607-014	EP2308607-015	EP2308607-016	EP2308607-017	EP2308607-018
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0082_QC301_230626	0082_QC302_230626	0082_QC303_230626	0082_QC401_230626	0082_QC402_230626
				Sampling date / time	26-Jun-2023 15:56	26-Jun-2023 15:57	26-Jun-2023 15:58	26-Jun-2023 15:59	26-Jun-2023 15:59
Compound	CAS Number	LOR	Unit		EP2308607-014	EP2308607-015	EP2308607-016	EP2308607-017	EP2308607-018
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**108**	**113**	**107**	**106**	**87.6**
13C8-PFOA	----	0.02	%		**103**	**101**	**103**	**98.1**	**99.2**

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0082_QC403_230626	----	----	----	----
				Sampling date / time	26-Jun-2023 16:01	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2308607-019	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0082_QC403_230626	----	----	----	----
				Sampling date / time	26-Jun-2023 16:01	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2308607-019	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**90.0**	----	----	----	----
13C8-PFOA	----	0.02	%		**95.0**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2308607**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 29-Jun-2023
C-O-C number	: 53955	Issue Date	: 07-Jul-2023
Sampler	: [redacted]		
Site	: HEHB GW - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 19		
No. of samples analysed	: 19		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Thomas Donovan	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5142964)									
EP2308607-002	0082_MW326_230626	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	501	521	3.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	501	521	3.9	0% - 20%
EP2308607-013	0082_OTH106_230626	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	126	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	125	126	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5140869)									
EP2308607-001	0082_MW108_230626	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	758	739	2.6	0% - 20%
EP2308607-012	0082_OTH104_230626	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2690	2720	1.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5140870)									
EP2308607-001	0082_MW108_230626	ED045G: Chloride	16887-00-6	1	mg/L	2910	2940	1.1	0% - 20%
EP2308607-012	0082_OTH104_230626	ED045G: Chloride	16887-00-6	1	mg/L	18300	18400	0.6	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5140820)									
EP2308607-001	0082_MW108_230626	ED093F: Calcium	7440-70-2	1	mg/L	62	60	3.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	109	108	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2350	2320	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	94	93	0.0	0% - 20%
EP2308607-012	0082_OTH104_230626	ED093F: Calcium	7440-70-2	1	mg/L	480	474	1.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1490	1480	0.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11500	11400	0.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	610	610	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5145699)									
EP2308440-044	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP2308607-001	0082_MW108_230626	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.14	0.13	0.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5145706)									
EP2308618-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.11	0.10	0.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.22	0.21	0.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5145710)									
EP2308608-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5145699)									
EP2308440-044	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP2308607-001	0082_MW108_230626	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5145699) - continued									
EP2308607-001	0082_MW108_230626	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5145706)									
EP2308618-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5145710)									
EP2308608-005	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5145699)									
EP2308440-044	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5145699) - continued									
EP2308440-044	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2308607-001	0082_MW108_230626	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5145706)									
EP2308618-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5145710)									
EP2308608-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5145710) - continued									
EP2308608-005	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5145699)									
EP2308440-044	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP2308607-001	0082_MW108_230626	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5145706)									
EP2308618-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5145710)									
EP2308608-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5145710) - continued									
EP2308608-005	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5145699)									
EP2308440-044	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP2308607-001	0082_MW108_230626	EP231X: Sum of PFAS	----	0.01	µg/L	0.16	0.15	6.5	0% - 50%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.16	0.15	6.5	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.16	0.15	6.5	0% - 50%
EP231P: PFAS Sums (QC Lot: 5145706)									
EP2308618-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.34	0.31	9.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.33	0.31	6.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.34	0.31	9.2	0% - 20%
EP231P: PFAS Sums (QC Lot: 5145710)									
EP2308608-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5142964)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	99.0	87.8	118
				<1	200 mg/L	99.8	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5140869)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	89.9	112
				<1	500 mg/L	94.0	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5140870)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	88.6	113
				<1	1000 mg/L	94.1	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5140820)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.3	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.4	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145699)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	98.3	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	99.5	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	103	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	99.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	111	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	106	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145706)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	103	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	103	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	99.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	88.9	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	87.3	53.0	142

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145710)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	102	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	102	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	102	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	104	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145699)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	111	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	106	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	116	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	103	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	113	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145706)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	114	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.0	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	118	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	102	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145710)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	102	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	99.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145710) - continued								
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145699)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	118	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	127	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	87.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.6	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	89.7	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	98.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	105	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145706)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	115	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.1	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.8	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	92.8	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	115	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	109	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145710)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	100	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145710) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	98.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	103	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	105	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	100	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145699)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	116	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	108	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	92.1	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145706)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	116	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	101	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	82.4	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145710)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	110	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	120	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	118	64.2	133
EP231P: PFAS Sums (QCLot: 5145699)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5145706)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5145710)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 5145710) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5140869)							
EP2308607-001	0082_MW108_230626	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5140870)							
EP2308607-001	0082_MW108_230626	ED045G: Chloride	16887-00-6	1000 mg/L	72.1	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145699)							
EP2308440-045	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	104	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	98.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	93.4	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	93.8	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	111	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	110	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145706)							
EP2308618-014	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	109	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	108	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	93.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	96.2	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	104	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	103	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145710)							
EP2308608-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	93.1	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	102	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	94.4	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	104	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	90.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	98.8	53.0	129

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145699)							
EP2308440-045	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	109	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	98.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	90.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	96.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	99.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	101	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	95.8	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	95.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	97.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	82.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	102	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145706)							
EP2308618-014	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	112	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	100	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	92.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	97.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	102	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	103	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	102	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	94.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	94.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	103	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145710)							
EP2308608-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	104	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	96.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	98.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	96.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	94.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	114	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	115	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	126	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	115	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	114	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145699)							
EP2308440-045	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	94.4	59.0	135

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145699) - continued							
EP2308440-045	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	127	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	94.9	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	94.3	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	104	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	103	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	84.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145706)							
EP2308618-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	107	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	102	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	80.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	97.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	92.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	120	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	106	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145710)							
EP2308608-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	96.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	92.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	101	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	102	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	112	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	90.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145699)							
EP2308440-045	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	106	63.0	143

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145699) - continued							
EP2308440-045	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	99.6	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	94.4	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145706)							
EP2308618-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	101	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	98.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	104	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	104	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145710)							
EP2308608-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	109	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	104	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	122	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	111	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2308607**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023
Site	: HEHB GW - MB	Issue Date	: 07-Jul-2023
Sampler	: [redacted]	No. of samples received	: 19
Order number	: pfas-omp HEHB	No. of samples analysed	: 19

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2308607--001	0082_MW108_230626	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0082_MW108_230626,	0082_MW326_230626,	----	----	----	04-Jul-2023	03-Jul-2023	**1**
0082_MW145_230626,	0082_MW126_230626,						
0082_MW122_230626,	0082_MW105S_230626,						
0082_MW144S_230626,	0082_OTH101_230626,						
0082_MW128_3.7-4.2_230626,	0082_MW131_4.0-4.5_230626,						
0082_OTH104_230626,	0082_OTH106_230626						

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC 4	Regular	Actual	Expected	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	4	45	8.89	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0082_MW108_230626, 0082_MW326_230626, 0082_MW145_230626, 0082_MW126_230626, 0082_MW122_230626, 0082_MW105S_230626, 0082_MW144S_230626, 0082_OTH101_230626, 0082_MW128_3.7-4.2_230626, 0082_MW131_4.0-4.5_230626, 0082_OTH104_230626, 0082_OTH106_230626	**26-Jun-2023**	**----**	----	----	**29-Jun-2023**	10-Jul-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0082_MW108_230626, 0082_MW326_230626, 0082_MW145_230626, 0082_MW126_230626, 0082_MW122_230626, 0082_MW105S_230626, 0082_MW144S_230626, 0082_OTH101_230626, 0082_MW128_3.7-4.2_230626, 0082_MW131_4.0-4.5_230626, 0082_OTH104_230626, 0082_OTH106_230626	**26-Jun-2023**	**----**	----	----	**07-Jul-2023**	24-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0082_MW108_230626, 0082_MW326_230626, 0082_MW145_230626, 0082_MW126_230626, 0082_MW122_230626, 0082_MW105S_230626, 0082_MW144S_230626, 0082_OTH101_230626, 0082_MW128_3.7-4.2_230626, 0082_MW131_4.0-4.5_230626, 0082_OTH104_230626, 0082_OTH106_230626	**26-Jun-2023**	**----**	----	----	**07-Jul-2023**	24-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0082_MW108_230626, 0082_MW326_230626, 0082_MW145_230626, 0082_MW126_230626, 0082_MW122_230626, 0082_MW105S_230626, 0082_MW144S_230626, 0082_OTH101_230626, 0082_MW128_3.7-4.2_230626, 0082_MW131_4.0-4.5_230626, 0082_OTH104_230626, 0082_OTH106_230626	**26-Jun-2023**	**----**	----	----	**04-Jul-2023**	03-Jul-2023	×

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0082_MW145_230626, 0082_MW105S_230626, 0082_OTH101_230626, 0082_MW128_3.7-4.2_230626, 0082_MW131_4.0-4.5_230626, 0082_OTH104_230626, 0082_OTH106_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW108_230626, 0082_MW326_230626, 0082_QC102_230626, 0082_MW126_230626, 0082_MW122_230626, 0082_MW144S_230626, 0082_QC301_230626, 0082_QC302_230626, 0082_QC303_230626, 0082_QC401_230626, 0082_QC402_230626, 0082_QC403_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0082_MW145_230626, 0082_MW105S_230626, 0082_OTH101_230626, 0082_MW128_3.7-4.2_230626, 0082_MW131_4.0-4.5_230626, 0082_OTH104_230626, 0082_OTH106_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW108_230626, 0082_MW326_230626, 0082_QC102_230626, 0082_MW126_230626, 0082_MW122_230626, 0082_MW144S_230626, 0082_QC301_230626, 0082_QC302_230626, 0082_QC303_230626, 0082_QC401_230626, 0082_QC402_230626, 0082_QC403_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0082_MW145_230626, 0082_MW105S_230626, 0082_OTH101_230626, 0082_MW128_3.7-4.2_230626, 0082_MW131_4.0-4.5_230626, 0082_OTH104_230626, 0082_OTH106_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW108_230626, 0082_MW326_230626, 0082_QC102_230626, 0082_MW126_230626, 0082_MW122_230626, 0082_MW144S_230626, 0082_QC301_230626, 0082_QC302_230626, 0082_QC303_230626, 0082_QC401_230626, 0082_QC402_230626, 0082_QC403_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0082_MW145_230626, 0082_MW105S_230626, 0082_OTH101_230626, 0082_MW128_3.7-4.2_230626, 0082_MW131_4.0-4.5_230626, 0082_OTH104_230626, 0082_OTH106_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW108_230626, 0082_MW326_230626, 0082_QC102_230626, 0082_MW126_230626, 0082_MW122_230626, 0082_MW144S_230626, 0082_QC301_230626, 0082_QC302_230626, 0082_QC303_230626, 0082_QC401_230626, 0082_QC402_230626, 0082_QC403_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0082_MW145_230626, 0082_MW105S_230626, 0082_OTH101_230626, 0082_MW128_3.7-4.2_230626, 0082_MW131_4.0-4.5_230626, 0082_OTH104_230626, 0082_OTH106_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW108_230626, 0082_MW326_230626, 0082_QC102_230626, 0082_MW126_230626, 0082_MW122_230626, 0082_MW144S_230626, 0082_QC301_230626, 0082_QC302_230626, 0082_QC303_230626, 0082_QC401_230626, 0082_QC402_230626, 0082_QC403_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	45	**8.89**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	45	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	45	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	45	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2308607**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0082_PFASOMP_23	Page	: 1 of 3
Order number	: pfas-omp HEHB	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53955	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: HEHB GW - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 28-Jun-2023 11:20	Issue Date	: 28-Jun-2023
Client Requested Due Date	: 07-Jul-2023	Scheduled Reporting Date	: **07-Jul-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 19 / 19

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EP2308607-010 : 26-Jun-2023 14:21 : 0082_MW128_3.7-4.2_230626
EP2308607-011 : 26-Jun-2023 14:59 : 0082_MW131_4.0-4.5_230626

Summary of Sample(s) and Requested Analysis

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

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2308607-001	26-Jun-2023 09:58	0082_MW108_230626	✓	✓
EP2308607-002	26-Jun-2023 10:18	0082_MW326_230626	✓	✓
EP2308607-003	26-Jun-2023 10:19	0082_QC102_230626	✓	
EP2308607-004	26-Jun-2023 10:36	0082_MW145_230626	✓	✓
EP2308607-005	26-Jun-2023 11:07	0082_MW126_230626	✓	✓
EP2308607-006	26-Jun-2023 11:26	0082_MW122_230626	✓	✓
EP2308607-007	26-Jun-2023 11:48	0082_MW105S_230626	✓	✓
EP2308607-008	26-Jun-2023 12:52	0082_MW144S_230626	✓	✓
EP2308607-009	26-Jun-2023 13:55	0082_OTH101_230626	✓	✓
EP2308607-010	26-Jun-2023 14:21	0082_MW128_3.7-4.2_2...	✓	✓
EP2308607-011	26-Jun-2023 14:59	0082_MW131_4.0-4.5_2...	✓	✓
EP2308607-012	26-Jun-2023 15:09	0082_OTH104_230626	✓	✓
EP2308607-013	26-Jun-2023 15:26	0082_OTH106_230626	✓	✓
EP2308607-014	26-Jun-2023 15:56	0082_QC301_230626	✓	
EP2308607-015	26-Jun-2023 15:57	0082_QC302_230626	✓	
EP2308607-016	26-Jun-2023 15:58	0082_QC303_230626	✓	
EP2308607-017	26-Jun-2023 15:59	0082_QC401_230626	✓	
EP2308607-018	26-Jun-2023 15:59	0082_QC402_230626	✓	
EP2308607-019	26-Jun-2023 16:01	0082_QC403_230626	✓	

Proactive Holding Time Report

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

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]cardno.com.au

DERP LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB)	Email	derp.labreports@esdat.com.au

[redacted]

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

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2308607

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0082-PFASOTP_23 **Client:** STANTEC **Project Manager:** Maelle BOURDAIS

53956 53979 53975 53984 53955 53957

ALS Compass COC Reference: 53958 **# Samples:** 53977 53956 **Phone:** (0448 308 372)

Sampler: JS CG MB

Phone: ( )

Turnaround Requirements: Standard _____ Urgent _____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC			
Date / Time: 27/06/23	Date / Time: 28/6 1120	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 53955 *ALS Laboratory:* EP Perth

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP_23

SITE: HEHB GW - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0082_MW108		26/06/2023 09:58 AM	WATER	ALS: 5 Non ALS: 0	No		X		Extra PFAS bottles for lab QC
002	0082_MW326		26/06/2023 10:18 AM	WATER	ALS: 3 Non ALS: 0	No		X		
003	0082_QC102		26/06/2023 10:19 AM	WATER	ALS: 2 Non ALS: 0	No	X			
004	0082_MW145		26/06/2023 10:36 AM	WATER	ALS: 3 Non ALS: 0	No		X		
005	0082_MW126		26/06/2023 11:07 AM	WATER	ALS: 5 Non ALS: 0	No		X		Extra PFAS bottles for lab QC
006	0082_MW122		26/06/2023 11:26 AM	WATER	ALS: 3 Non ALS: 0	No		X		
007	0082_MW105S		26/06/2023 11:48 AM	WATER	ALS: 3 Non ALS: 0	No		X		
008	0082_MW144S		26/06/2023 12:52 PM	WATER	ALS: 3 Non ALS: 0	No		X		
009	0082_OTH101		26/06/2023 01:55 PM	WATER	ALS: 3 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: **53955** *ALS Laboratory:* EP Perth

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP_23

SITE: HEHB GW - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0082_MW128_3.7-4.2		26/06/2023 02:21 PM	WATER	ALS: 3 Non ALS: 0	No		X		
011	0082_MW131_4.0-4.5		26/06/2023 02:59 PM	WATER	ALS: 3 Non ALS: 0	No		X		
012	0082_OTH104		26/06/2023 03:09 PM	WATER	ALS: 3 Non ALS: 0	No		X		
013	0082_OTH106		26/06/2023 03:26 PM	WATER	ALS: 3 Non ALS: 0	No		X		
014	0082_QC301		26/06/2023 03:56 PM	WATER	ALS: 2 Non ALS: 0	No	X			
015	0082_QC302		26/06/2023 03:57 PM	WATER	ALS: 2 Non ALS: 0	No	X			
016	0082_QC303		26/06/2023 03:58 PM	WATER	ALS: 2 Non ALS: 0	No	X			
017	0082_QC401		26/06/2023 03:59 PM	WATER	ALS: 2 Non ALS: 0	No	X			
018	0082_QC402		26/06/2023 03:59 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: 53955 *ALS Laboratory:* EP Perth

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP_23

SITE: HEHB GW - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Rinsate WATER	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0082_QC403		26/06/2023 04:01 PM	WATER	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

(ALS) COC#: 53955 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP_23

SITE: HEHB GW - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0082_MW108	HDPE (no PTFE)	20 mL	00350822082131	Grey	No	
001	0082_MW108	HDPE (no PTFE)	20 mL	00350621067048	Grey	No	
001	0082_MW108	Clear Plastic Bottle - Natural	125 mL	00071121129682	Green	No	
001	0082_MW108	HDPE (no PTFE)	20 mL	00350019112597	Grey	No	
001	0082_MW108	HDPE (no PTFE)	20 mL	00350822082236	Grey	No	
002	0082_MW326	HDPE (no PTFE)	20 mL	00350822082169	Grey	No	
002	0082_MW326	Clear Plastic Bottle - Natural	125 mL	00071121130189	Green	No	
002	0082_MW326	HDPE (no PTFE)	20 mL	00350822082248	Grey	No	
003	0082_QC102	HDPE (no PTFE)	20 mL	00350822082247	Grey	No	
003	0082_QC102	HDPE (no PTFE)	20 mL	00350822082085	Grey	No	
004	0082_MW145	HDPE (no PTFE)	20 mL	00350822082246	Grey	No	
004	0082_MW145	HDPE (no PTFE)	20 mL	00350822082238	Grey	No	
004	0082_MW145	Clear Plastic Bottle - Natural	125 mL	00071121130171	Green	No	
005	0082_MW126	Clear Plastic Bottle - Natural	125 mL	00071121129678	Green	No	
005	0082_MW126	HDPE (no PTFE)	20 mL	00350822082014	Grey	No	
005	0082_MW126	HDPE (no PTFE)	20 mL	00350822082114	Grey	No	
005	0082_MW126	HDPE (no PTFE)	20 mL	00352101058201	Grey	No	
005	0082_MW126	HDPE (no PTFE)	20 mL	00352005006885	Grey	No	
006	0082_MW122	Clear Plastic Bottle - Natural	125 mL	00071121130147	Green	No	
006	0082_MW122	HDPE (no PTFE)	20 mL	00350822082145	Grey	No	
006	0082_MW122	HDPE (no PTFE)	20 mL	00350822082199	Grey	No	
007	0082_MW105S	Clear Plastic Bottle - Natural	125 mL	00071121129723	Green	No	
007	0082_MW105S	HDPE (no PTFE)	20 mL	00350822082260	Grey	No	
007	0082_MW105S	HDPE (no PTFE)	20 mL	00350822082185	Grey	No	
008	0082_MW144S	Clear Plastic Bottle - Natural	125 mL	00071121130159	Green	No	
008	0082_MW144S	HDPE (no PTFE)	20 mL	00350822082217	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 53955 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP_23

SITE: HEHB GW - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

008	0082_MW144S	HDPE (no PTFE)	20 mL	00350822082212	Grey	No	
009	0082_OTH101	Clear Plastic Bottle - Natural	125 mL	00071121130191	Green	No	
009	0082_OTH101	HDPE (no PTFE)	20 mL	00350822082068	Grey	No	
009	0082_OTH101	HDPE (no PTFE)	20 mL	00350822082011	Grey	No	
010	0082_MW128_3.7-4.2	Clear Plastic Bottle - Natural	125 mL	00071121129641	Green	No	
010	0082_MW128_3.7-4.2	HDPE (no PTFE)	20 mL	00350822082041	Grey	No	
010	0082_MW128_3.7-4.2	HDPE (no PTFE)	20 mL	00350822082276	Grey	No	
011	0082_MW131_4.0-4.5	Clear Plastic Bottle - Natural	125 mL	00071121130213	Green	No	
011	0082_MW131_4.0-4.5	HDPE (no PTFE)	20 mL	00350822082140	Grey	No	
011	0082_MW131_4.0-4.5	HDPE (no PTFE)	20 mL	00350822082074	Grey	No	
012	0082_OTH104	HDPE (no PTFE)	20 mL	00350822082252	Grey	No	
012	0082_OTH104	Clear Plastic Bottle - Natural	125 mL	00071121129706	Green	No	
012	0082_OTH104	HDPE (no PTFE)	20 mL	00350822082177	Grey	No	
013	0082_OTH106	Clear Plastic Bottle - Natural	125 mL	00071121129694	Green	No	
013	0082_OTH106	HDPE (no PTFE)	20 mL	00350822082288	Grey	No	
013	0082_OTH106	HDPE (no PTFE)	20 mL	00350822082292	Grey	No	
014	0082_QC301	HDPE (no PTFE)	20 mL	00350822000532	Grey	No	
014	0082_QC301	HDPE (no PTFE)	20 mL	00350822000388	Grey	No	
015	0082_QC302	HDPE (no PTFE)	20 mL	00350822000610	Grey	No	
015	0082_QC302	HDPE (no PTFE)	20 mL	00350822000555	Grey	No	
016	0082_QC303	HDPE (no PTFE)	20 mL	00350822000319	Grey	No	
016	0082_QC303	HDPE (no PTFE)	20 mL	00350822000540	Grey	No	
017	0082_QC401	HDPE (no PTFE)	20 mL	00350822000373	Grey	No	
017	0082_QC401	HDPE (no PTFE)	20 mL	00350822000452	Grey	No	
018	0082_QC402	HDPE (no PTFE)	20 mL	00350822000351	Grey	No	
018	0082_QC402	HDPE (no PTFE)	20 mL	00350822000441	Grey	No	
019	0082_QC403	HDPE (no PTFE)	20 mL	00350822000393	Grey	No	

CHAIN OF CUSTODY

.S) *COC#:* **53955** *ALS Laboratory:* EP Perth

.NT: MWHAUS - STANTEC AUSTRALIA PTY LTD

JECT: WA_0082_PFASOMP_23

: HEHB GW - MB

ER NO: pfas-omp HEHB

JECT MANAGER: [redacted]

IARY SAMPLER:

IL REPORTS TO:

IL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

19	0082_QC403	HDPE (no PTFE)	20 mL	00350822000376	Grey	No	

Total Bottle Count: ALS: 54, Non ALS: 0

CERTIFICATE OF ANALYSIS

Work Order	: **EP2308608**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023 11:20
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 29-Jun-2023
C-O-C number	: 53956	Issue Date	: 07-Jul-2023 13:57
Sampler	: [redacted]		
Site	: HEHB GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Thomas Donovan	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- ED037-P (Alkalinity): Samples EP2308608-5 and 7 were centrifuged before analysis to reduce possible interference from sediment which may consume the alkalinity titrant.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0082_MW147_230626	0082_QC101_230626	0082_MW148S_230626	0082_MW134_6.6-7.1_230626	0082_MW135_10.3-10.8_230626
				Sampling date / time	26-Jun-2023 09:57	26-Jun-2023 09:58	26-Jun-2023 10:32	26-Jun-2023 10:50	26-Jun-2023 11:07
					EP2308608-001	EP2308608-002	EP2308608-003	EP2308608-004	EP2308608-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**410**	**395**	**415**	**342**	**622**
Total Alkalinity as CaCO3	----	1	mg/L		**410**	**395**	**415**	**342**	**622**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**1480**	**1440**	**1960**	**1840**	**2070**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**11500**	**11700**	**14400**	**14400**	**5370**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**451**	**476**	**588**	**558**	**109**
Magnesium	7439-95-4	1	mg/L		**826**	**833**	**1040**	**964**	**385**
Sodium	7440-23-5	1	mg/L		**6660**	**6700**	**8720**	**8280**	**4660**
Potassium	7440-09-7	1	mg/L		**312**	**308**	**379**	**338**	**190**
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**363**	**368**	**455**	**451**	**207**
ø **Total Cations**	----	0.01	meq/L		**388**	**392**	**504**	**476**	**245**
ø **Ionic Balance**	----	0.01	%		**3.29**	**3.12**	**5.07**	**2.66**	**8.34**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW147_230626	0082_QC101_230626	0082_MW148S_230626	0082_MW134_6.6-7.1_230626	0082_MW135_10.3-10.8_230626
				Sampling date / time	26-Jun-2023 09:57	26-Jun-2023 09:58	26-Jun-2023 10:32	26-Jun-2023 10:50	26-Jun-2023 11:07
Compound	CAS Number	LOR	Unit		EP2308608-001	EP2308608-002	EP2308608-003	EP2308608-004	EP2308608-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW147_230626	0082_QC101_230626	0082_MW148S_230626	0082_MW134_6.6-7.1_230626	0082_MW135_10.3-10.8_230626
				Sampling date / time	26-Jun-2023 09:57	26-Jun-2023 09:58	26-Jun-2023 10:32	26-Jun-2023 10:50	26-Jun-2023 11:07
Compound	CAS Number	LOR	Unit		EP2308608-001	EP2308608-002	EP2308608-003	EP2308608-004	EP2308608-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**73.4**	**111**	**103**	**98.5**	**101**
13C8-PFOA	----	0.02	%		**103**	**98.9**	**94.2**	**101**	**82.9**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0082_MW151S_230626	0082_MW152S_230626	0082_MW153S_230626	0082_MW129_3.5-4.0_230626	0082_MW130_4.9-5.4_230626
				Sampling date / time	26-Jun-2023 11:53	26-Jun-2023 12:07	26-Jun-2023 12:33	26-Jun-2023 13:29	26-Jun-2023 13:46
					EP2308608-006	EP2308608-007	EP2308608-008	EP2308608-009	EP2308608-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**398**	**330**	**333**	**145**	**259**
Total Alkalinity as CaCO3	----	1	mg/L		**398**	**330**	**333**	**145**	**259**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2700**	**2400**	**1980**	**2520**	**1570**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**18500**	**16800**	**15400**	**17600**	**10700**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**571**	**574**	**560**	**497**	**321**
Magnesium	7439-95-4	1	mg/L		**1500**	**1240**	**1210**	**1450**	**891**
Sodium	7440-23-5	1	mg/L		**11700**	**10200**	**9760**	**11300**	**6760**
Potassium	7440-09-7	1	mg/L		**632**	**556**	**514**	**601**	**359**
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**586**	**530**	**482**	**552**	**340**
ø **Total Cations**	----	0.01	meq/L		**677**	**588**	**565**	**651**	**392**
ø **Ionic Balance**	----	0.01	%		**7.20**	**5.19**	**7.92**	**8.25**	**7.22**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW151S_230626	0082_MW152S_230626	0082_MW153S_230626	0082_MW129_3.5-4.0_230626	0082_MW130_4.9-5.4_230626
				Sampling date / time	26-Jun-2023 11:53	26-Jun-2023 12:07	26-Jun-2023 12:33	26-Jun-2023 13:29	26-Jun-2023 13:46
Compound	CAS Number	LOR	Unit		EP2308608-006	EP2308608-007	EP2308608-008	EP2308608-009	EP2308608-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW151S_230626	0082_MW152S_230626	0082_MW153S_230626	0082_MW129_3.5-4.0_230626	0082_MW130_4.9-5.4_230626
				Sampling date / time	26-Jun-2023 11:53	26-Jun-2023 12:07	26-Jun-2023 12:33	26-Jun-2023 13:29	26-Jun-2023 13:46
Compound	CAS Number	LOR	Unit		EP2308608-006	EP2308608-007	EP2308608-008	EP2308608-009	EP2308608-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.1**	**93.6**	**110**	**106**	**95.5**
13C8-PFOA	----	0.02	%		**94.6**	**97.1**	**101**	**99.9**	**95.3**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW132_6.4-6.9_230626	----	----	----	----
				Sampling date / time	26-Jun-2023 15:11	----	----	----	----
Compound	CAS Number	LOR	Unit	EP2308608-011	--------	--------	--------	--------	
				Result	----	----	----	----	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**250**	----	----	----	----	
Total Alkalinity as CaCO3	----	1	mg/L	**250**	----	----	----	----	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2090**	----	----	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	**13500**	----	----	----	----	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	**436**	----	----	----	----	
Magnesium	7439-95-4	1	mg/L	**1150**	----	----	----	----	
Sodium	7440-23-5	1	mg/L	**8980**	----	----	----	----	
Potassium	7440-09-7	1	mg/L	**478**	----	----	----	----	
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L	**429**	----	----	----	----	
ø Total Cations	----	0.01	meq/L	**519**	----	----	----	----	
ø Ionic Balance	----	0.01	%	**9.48**	----	----	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	**0.03**	----	----	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	**0.03**	----	----	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	**0.12**	----	----	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	----	----	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	----	----	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	----	----	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	----	----	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	----	----	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	----	----	----	----	

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW132_6.4-6.9_230626	----	----	----	----
				Sampling date / time	26-Jun-2023 15:11	----	----	----	----
Compound	CAS Number	LOR	Unit	EP2308608-011	--------	--------	--------	--------	
				Result	----	----	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	----	----	----	----	
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	----	----	----	----	
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	----	----	----	----	
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	----	----	----	----	
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	----	----	----	----	
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	----	----	----	----	
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	----	----	----	----	
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	----	----	----	----	
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	----	----	----	----	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	----	----	----	----	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	----	----	----	----	
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	----	----	----	----	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	----	----	----	----	
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	----	----	----	----	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	----	----	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	----	----	----	----	
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	----	----	----	----	

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW132_6.4-6.9_230626	----	----	----	----
				Sampling date / time	26-Jun-2023 15:11	----	----	----	----
Compound	CAS Number	LOR	Unit	EP2308608-011	--------	--------	--------	--------	
				Result	----	----	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	----	----	----	----	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	----	----	----	----	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	**0.18**	----	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	**0.12**	----	----	----	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	**0.15**	----	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	**102**	----	----	----	----	
13C8-PFOA	----	0.02	%	**90.6**	----	----	----	----	

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	***Low***	***High***
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2308608**	Page	: 1 of 12
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 29-Jun-2023
C-O-C number	: 53956	Issue Date	: 07-Jul-2023
Sampler	: [redacted]		
Site	: HEHB GW - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 11		
No. of samples analysed	: 11		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Thomas Donovan	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5142964)									
EP2308607-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	501	521	3.9	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	501	521	3.9	0% - 20%
EP2308607-013	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	125	126	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	125	126	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5144555)									
EP2308608-009	0082_MW129_3.5-4.0_230626	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	145	144	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	145	144	0.0	0% - 20%
EP2308618-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	141	141	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	141	141	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5140869)									
EP2308607-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	758	739	2.6	0% - 20%
EP2308607-012	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2690	2720	1.1	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5140872)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5140872) - continued									
EP2308608-009	0082_MW129_3.5-4.0_230626	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2520	2540	0.6	0% - 20%
EP2308618-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	167	155	7.5	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5140870)									
EP2308607-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2910	2940	1.1	0% - 20%
EP2308607-012	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	18300	18400	0.6	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5140873)									
EP2308608-009	0082_MW129_3.5-4.0_230626	ED045G: Chloride	16887-00-6	1	mg/L	17600	17400	1.3	0% - 20%
EP2308618-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1260	1260	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5140820)									
EP2308607-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	62	60	3.6	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	109	108	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	2350	2320	1.2	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	94	93	0.0	0% - 20%
EP2308607-012	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	480	474	1.3	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1490	1480	0.9	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11500	11400	0.6	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	610	610	0.0	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5140821)									
EP2308608-009	0082_MW129_3.5-4.0_230626	ED093F: Calcium	7440-70-2	1	mg/L	497	526	5.7	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1450	1540	5.5	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11300	11900	5.3	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	601	640	6.2	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5145706)									
EP2308618-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.11	0.10	0.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.22	0.21	0.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5145710)									
EP2308608-005	0082_MW135_10.3-10.8_230626	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5145710) - continued									
EP2308608-005	0082_MW135_10.3-10.8_230626	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5145706)									
EP2308618-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5145710)									
EP2308608-005	0082_MW135_10.3-10.8_230626	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5145706)									
EP2308618-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5145706) - continued									
EP2308618-002	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5145710)									
EP2308608-005	0082_MW135_10.3-10.8_230626	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5145706)									
EP2308618-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5145710)									
EP2308608-005	0082_MW135_10.3-10.8_230626	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5145706)									
EP2308618-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.34	0.31	9.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.33	0.31	6.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.34	0.31	9.2	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 5145710)									
EP2308608-005	0082_MW135_10.3-10.8_230626	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5142964)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	99.0	87.8	118
				<1	200 mg/L	99.8	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 5144555)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	96.0	87.8	118
				<1	200 mg/L	99.5	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5140869)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	89.9	112
				<1	500 mg/L	94.0	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5140872)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	90.7	89.9	112
				<1	500 mg/L	91.6	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5140870)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	88.6	113
				<1	1000 mg/L	94.1	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 5140873)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.3	88.6	113
				<1	1000 mg/L	95.1	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5140820)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	101	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.3	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.6	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.4	84.6	108
ED093F: Dissolved Major Cations (QCLot: 5140821)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
ED093F: Dissolved Major Cations (QCLot: 5140821) - continued								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	97.2	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	98.8	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	95.8	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145706)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	103	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	103	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	99.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	88.9	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	87.3	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145710)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	102	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	102	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	102	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	104	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145706)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	114	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.0	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	118	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	102	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145710)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	102	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	99.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145710) - continued								
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145706)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	115	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.1	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.8	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	92.8	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	115	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	109	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145710)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	100	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	98.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	103	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	105	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	100	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145706)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	116	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	101	67.0	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145706) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	82.4	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145710)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	110	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	120	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	118	64.2	133
EP231P: PFAS Sums (QCLot: 5145706)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5145710)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5140869)							
EP2308607-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5140872)							
EP2308608-009	0082_MW129_3.5-4.0_230626	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5140870)							
EP2308607-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	72.1	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5140873)							
EP2308608-009	0082_MW129_3.5-4.0_230626	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145706)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145706) - continued							
EP2308618-014	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	109	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	108	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	93.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	96.2	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	104	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	103	53.0	129
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145710)							
EP2308608-006	0082_MW151S_230626	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	93.1	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	102	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	94.4	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	104	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	90.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	98.8	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145706)							
EP2308618-014	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	112	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	100	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	92.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	97.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	102	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	103	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	102	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	94.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	94.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	103	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145710)							
EP2308608-006	0082_MW151S_230626	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	104	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	96.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	98.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	96.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	94.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	114	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	115	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	126	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	115	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	114	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145706)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145706) - continued							
EP2308618-014	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	107	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	102	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	80.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	97.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	92.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	120	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	106	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145710)							
EP2308608-006	0082_MW151S_230626	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	96.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	92.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	101	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	102	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	112	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	90.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145706)							
EP2308618-014	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	101	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	98.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	104	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	104	70.0	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145710)							
EP2308608-006	0082_MW151S_230626	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	109	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	104	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	122	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	111	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2308608**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023
Site	: HEHB GW - CG	Issue Date	: 07-Jul-2023
Sampler	: [redacted]	No. of samples received	: 11
Order number	: pfas-omp HEHB	No. of samples analysed	: 11

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2308607--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2308608--009	0082_MW129_3.5-4.0_230626	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2308608--009	0082_MW129_3.5-4.0_230626	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method / Container / Client Sample ID(s)		Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
0082_MW147_230626,	0082_QC101_230626,	----	----	----	04-Jul-2023	03-Jul-2023	**1**
0082_MW148S_230626,	0082_MW134_6.6-7.1_230626,						
0082_MW135_10.3-10.8_230626,	0082_MW151S_230626,						
0082_MW152S_230626,	0082_MW153S_230626,						
0082_MW129_3.5-4.0_230626,	0082_MW130_4.9-5.4_230626,						
0082_MW132_6.4-6.9_230626							

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Laboratory Duplicates (DUP)	2				
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	26	7.69	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER** Evaluation: × = Holding time breach ; ✓ = Within holding time.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0082_MW147_230626, 0082_QC101_230626, 0082_MW148S_230626, 0082_MW134_6.6-7.1_230626, 0082_MW135_10.3-10.8_230626, 0082_MW151S_230626, 0082_MW152S_230626, 0082_MW153S_230626	**26-Jun-2023**	**----**	----	----	**29-Jun-2023**	10-Jul-2023	✓
Clear Plastic Bottle - Natural (ED037-P)							
0082_MW129_3.5-4.0_230626, 0082_MW130_4.9-5.4_230626, 0082_MW132_6.4-6.9_230626	**26-Jun-2023**	**----**	----	----	**30-Jun-2023**	10-Jul-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0082_MW147_230626, 0082_QC101_230626, 0082_MW148S_230626, 0082_MW134_6.6-7.1_230626, 0082_MW135_10.3-10.8_230626, 0082_MW151S_230626, 0082_MW152S_230626, 0082_MW153S_230626, 0082_MW129_3.5-4.0_230626, 0082_MW130_4.9-5.4_230626, 0082_MW132_6.4-6.9_230626	**26-Jun-2023**	**----**	----	----	**07-Jul-2023**	24-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0082_MW147_230626, 0082_QC101_230626, 0082_MW148S_230626, 0082_MW134_6.6-7.1_230626, 0082_MW135_10.3-10.8_230626, 0082_MW151S_230626, 0082_MW152S_230626, 0082_MW153S_230626, 0082_MW129_3.5-4.0_230626, 0082_MW130_4.9-5.4_230626, 0082_MW132_6.4-6.9_230626	**26-Jun-2023**	**----**	----	----	**07-Jul-2023**	24-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0082_MW147_230626, 0082_QC101_230626, 0082_MW148S_230626, 0082_MW134_6.6-7.1_230626, 0082_MW135_10.3-10.8_230626, 0082_MW151S_230626, 0082_MW152S_230626, 0082_MW153S_230626, 0082_MW129_3.5-4.0_230626, 0082_MW130_4.9-5.4_230626, 0082_MW132_6.4-6.9_230626	**26-Jun-2023**	**----**	----	----	**04-Jul-2023**	03-Jul-2023	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0082_MW148S_230626, 0082_MW135_10.3-10.8_230626, 0082_MW151S_230626, 0082_MW130_4.9-5.4_230626, 0082_MW132_6.4-6.9_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X)							
0082_MW147_230626, 0082_QC101_230626, 0082_MW134_6.6-7.1_230626, 0082_MW152S_230626, 0082_MW153S_230626, 0082_MW129_3.5-4.0_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0082_MW148S_230626, 0082_MW151S_230626, 0082_MW132_6.4-6.9_230626	0082_MW135_10.3-10.8_230626, 0082_MW130_4.9-5.4_230626,	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X)								
0082_MW147_230626, 0082_MW134_6.6-7.1_230626, 0082_MW153S_230626,	0082_QC101_230626, 0082_MW152S_230626, 0082_MW129_3.5-4.0_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0082_MW148S_230626, 0082_MW151S_230626, 0082_MW132_6.4-6.9_230626	0082_MW135_10.3-10.8_230626, 0082_MW130_4.9-5.4_230626,	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X)								
0082_MW147_230626, 0082_MW134_6.6-7.1_230626, 0082_MW153S_230626,	0082_QC101_230626, 0082_MW152S_230626, 0082_MW129_3.5-4.0_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0082_MW148S_230626, 0082_MW151S_230626, 0082_MW132_6.4-6.9_230626	0082_MW135_10.3-10.8_230626, 0082_MW130_4.9-5.4_230626,	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X)								
0082_MW147_230626, 0082_MW134_6.6-7.1_230626, 0082_MW153S_230626,	0082_QC101_230626, 0082_MW152S_230626, 0082_MW129_3.5-4.0_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0082_MW148S_230626, 0082_MW151S_230626, 0082_MW132_6.4-6.9_230626	0082_MW135_10.3-10.8_230626, 0082_MW130_4.9-5.4_230626,	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X)								
0082_MW147_230626, 0082_MW134_6.6-7.1_230626, 0082_MW153S_230626,	0082_QC101_230626, 0082_MW152S_230626, 0082_MW129_3.5-4.0_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	3	23	**13.04**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	26	**7.69**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	23	**8.70**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EP2308608**		
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0082_PFASOMP_23	Page	: 1 of 3
Order number	: pfas-omp HEHB	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53956	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: HEHB GW - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 28-Jun-2023 11:20	Issue Date	: 30-Jun-2023
Client Requested Due Date	: 07-Jul-2023	Scheduled Reporting Date	: **07-Jul-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: ----	Temperature	: 6.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 11 / 11

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EP2308608-004	: 26-Jun-2023 10:50	: 0082_MW134_6.6-7.1_230626
EP2308608-005	: 26-Jun-2023 11:07	: 0082_MW135_10.3-10.8_230626
EP2308608-009	: 26-Jun-2023 13:29	: 0082_MW129_3.5-4.0_230626
EP2308608-010	: 26-Jun-2023 13:46	: 0082_MW130_4.9-5.4_230626
EP2308608-011	: 26-Jun-2023 15:11	: 0082_MW132_6.4-6.9_230626

Summary of Sample(s) and Requested Analysis

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

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2308608-001	26-Jun-2023 09:57	0082_MW147_230626	✓	✓
EP2308608-002	26-Jun-2023 09:58	0082_QC101_230626	✓	✓
EP2308608-003	26-Jun-2023 10:32	0082_MW148S_230626	✓	✓
EP2308608-004	26-Jun-2023 10:50	0082_MW134_6.6-7.1_2...	✓	✓
EP2308608-005	26-Jun-2023 11:07	0082_MW135_10.3-10.8...	✓	✓
EP2308608-006	26-Jun-2023 11:53	0082_MW151S_230626	✓	✓
EP2308608-007	26-Jun-2023 12:07	0082_MW152S_230626	✓	✓
EP2308608-008	26-Jun-2023 12:33	0082_MW153S_230626	✓	✓
EP2308608-009	26-Jun-2023 13:29	0082_MW129_3.5-4.0_2...	✓	✓
EP2308608-010	26-Jun-2023 13:46	0082_MW130_4.9-5.4_2...	✓	✓
EP2308608-011	26-Jun-2023 15:11	0082_MW132_6.4-6.9_2...	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]cardno.com.au

DERP LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB)	Email	derp.labreports@esdat.com.au

[redacted]

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

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2308608

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0082-PFASOTP_23 **Client:** STANTEC **Project Manager:** Maelle BOURDAIS

53956 53979 53975 53984 53955 53957

ALS Compass COC Reference: 53958 **# Samples:** 53977 53956 53979 **Phone:** (0448 308 372)

Sampler: JS CG JB

Phone: ( )

Turnaround Requirements: (Standard) _____ Urgent _____

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by:	Relinquished by:	Received by:
Date / Time: 27/06/23	Date / Time: 28/6 1120	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 53956 *ALS Laboratory:* EP Perth

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP_23

SITE: HEHB GW [redacted]

ORDER NO: pfas-omp

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Dishonard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

SAMPLE DETAILS

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0082_MW147		26/06/2023 09:57 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0082_QC101		26/06/2023 09:58 AM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0082_MW148S		26/06/2023 10:32 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0082_MW134		26/06/2023 10:50 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0082_MW135		26/06/2023 11:07 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra lab QAQC PFAS
006	0082_MW151S		26/06/2023 11:53 AM	WATER	ALS: 5 Non ALS: 0	No	X		Extra lab QAQC PFAS
007	0082_MW152S		26/06/2023 12:07 PM	WATER	ALS: 3 Non ALS: 0	No	X		
008	0082_MW153S		26/06/2023 12:33 PM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0082_MW129		26/06/2023 01:29 PM	WATER	ALS: 3 Non ALS: 0	No	X		

8:20:24 AM

CHAIN OF CUSTODY

ALS COC#: 53956 ALS Laboratory: EP Perth

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP_23

SITE: HEHB GW - CG

ORDER NO: pfas-omp-HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0082_MW130		26/06/2023 01:46 PM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0082_MW132		26/06/2023 03:11 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 53956 *ALS Laboratory:* EP Perth

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP_23

SITE: HEHB GW - CG

ORDER NO: pfas-omp

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0082_MW147	HDPE (no PTFE)	20 mL	00350822082127	Grey	No	
001	0082_MW147	HDPE (no PTFE)	20 mL	00350822082050	Grey	No	
001	0082_MW147	Clear Plastic Bottle - Natural	125 mL	00071121129634	Green	No	
002	0082_QC101	HDPE (no PTFE)	20 mL	00350822082290	Grey	No	
002	0082_QC101	HDPE (no PTFE)	20 mL	00350822082142	Grey	No	
002	0082_QC101	Clear Plastic Bottle - Natural	125 mL	00071121129724	Green	No	
003	0082_MW148S	HDPE (no PTFE)	20 mL	00350821000471	Grey	No	
003	0082_MW148S	HDPE (no PTFE)	20 mL	00350821000406	Grey	No	
003	0082_MW148S	Clear Plastic Bottle - Natural	125 mL	00070821219924	Green	No	
004	0082_MW134	HDPE (no PTFE)	20 mL	00350522043117	Grey	No	
004	0082_MW134	HDPE (no PTFE)	20 mL	00350522043014	Grey	No	
004	0082_MW134	Clear Plastic Bottle - Natural	125 mL	00070522145131	Green	No	
005	0082_MW135	HDPE (no PTFE)	20 mL	00350522042770	Grey	No	
005	0082_MW135	HDPE (no PTFE)	20 mL	00350621066761	Grey	No	
005	0082_MW135	HDPE (no PTFE)	20 mL	00350522042862	Grey	No	
005	0082_MW135	HDPE (no PTFE)	20 mL	00350621066981	Grey	No	
005	0082_MW135	Clear Plastic Bottle - Natural	125 mL	00070522145100	Green	No	
006	0082_MW151S	HDPE (no PTFE)	20 mL	00350821001766	Grey	No	
006	0082_MW151S	HDPE (no PTFE)	20 mL	00350821001739	Grey	No	
006	0082_MW151S	HDPE (no PTFE)	20 mL	00350621067236	Grey	No	
006	0082_MW151S	HDPE (no PTFE)	20 mL	00350621067014	Grey	No	
006	0082_MW151S	Clear Plastic Bottle - Natural	125 mL	00070522145105	Green	No	
007	0082_MW152S	HDPE (no PTFE)	20 mL	00350822082084	Grey	No	
007	0082_MW152S	HDPE (no PTFE)	20 mL	00350822082133	Grey	No	
007	0082_MW152S	Clear Plastic Bottle - Natural	125 mL	00071121129654	Green	No	
008	0082_MW153S	HDPE (no PTFE)	20 mL	00350822082174	Grey	No	

CHAIN OF CUSTODY

COC#: 53956 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP_23

SITE: HEHB GW - CG

ORDER NO: pfas-omp

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comments:			

008	0082_MW153S	HDPE (no PTFE)	20 mL	00350822082266	Grey	No	
008	0082_MW153S	Clear Plastic Bottle - Natural	125 mL	00071121129714	Green	No	
009	0082_MW129	HDPE (no PTFE)	20 mL	00350822082108	Grey	No	
009	0082_MW129	HDPE (no PTFE)	20 mL	00350822082136	Grey	No	
009	0082_MW129	Clear Plastic Bottle - Natural	125 mL	00071121129699	Green	No	
010	0082_MW130	HDPE (no PTFE)	20 mL	00350822082164	Grey	No	
010	0082_MW130	HDPE (no PTFE)	20 mL	00350822082081	Grey	No	
010	0082_MW130	Clear Plastic Bottle - Natural	125 mL	00071121129659	Green	No	
011	0082_MW132	HDPE (no PTFE)	20 mL	00350822082225	Grey	No	
011	0082_MW132	HDPE (no PTFE)	20 mL	00350822082190	Grey	No	
011	0082_MW132	Clear Plastic Bottle - Natural	125 mL	00071121129650	Green	No	

Total Bottle Count: ALS: 37, Non ALS: 0

CERTIFICATE OF ANALYSIS

Work Order	: **EP2308609**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023 11:20
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 30-Jun-2023
C-O-C number	: 53977	Issue Date	: 05-Jul-2023 16:37
Sampler	: [redacted]		
Site	: HEHB SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Thomas Donovan	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

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

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

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

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0082_SD161_230626	0082_SD162_230626	0082_QC106_230626	0082_SD163_230626	----
				Sampling date / time	26-Jun-2023 13:15	26-Jun-2023 13:38	26-Jun-2023 13:39	26-Jun-2023 13:51	----
Compound	CAS Number	LOR	Unit		EP2308609-001	EP2308609-002	EP2308609-003	EP2308609-004	--------
					Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**33.5**	**44.7**	**39.8**	**25.1**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)			Sample ID	0082_SD161_230626	0082_SD162_230626	0082_QC106_230626	0082_SD163_230626	----
			Sampling date / time	26-Jun-2023 13:15	26-Jun-2023 13:38	26-Jun-2023 13:39	26-Jun-2023 13:51	----
Compound	CAS Number	LOR	Unit	EP2308609-001	EP2308609-002	EP2308609-003	EP2308609-004	--------
				Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued								
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums								
Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	----
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	**97.5**	**120**	**95.0**	**112**	----
13C8-PFOA	----	0.0002	%	**99.5**	**110**	**96.5**	**101**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	***Low***	***High***
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2308609**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 30-Jun-2023
C-O-C number	: 53977	Issue Date	: 05-Jul-2023
Sampler	: [redacted]		
Site	: HEHB SD - MB		
Quote number	: SY/139/19 B		
No. of samples received	: 4		
No. of samples analysed	: 4		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Thomas Donovan	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5149805)									
EP2308503-010	Anonymous	EA055: Moisture Content	----	0.1	%	9.8	8.9	9.4	0% - 20%
EP2308619-003	Anonymous	EA055: Moisture Content	----	0.1	%	1.7	1.6	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5144434)									
EP2308516-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2308619-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0052	0.0063	18.8	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5144434)									
EP2308516-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5144434) - continued									
EP2308516-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2308619-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5144434)									
EP2308516-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2308619-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5144434)									
EP2308516-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	0.0013	0.0014	12.8	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2308619-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5144434)									
EP2308516-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0015	0.0016	6.5	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0015	0.0016	6.5	No Limit
EP2308619-003	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0055	0.0066	18.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0052	0.0063	19.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0052	0.0063	19.1	0% - 20%

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5144434)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	96.4	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	97.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	86.6	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	111	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	105	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5144434)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	110	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	97.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5144434)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.1	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.8	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5144434)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5144434) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	108	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	103	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	112	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	107	54.8	124
EP231P: PFAS Sums (QCLot: 5144434)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5144434)							
EP2308516-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	99.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	103	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	92.7	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	96.3	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	94.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	87.9	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5144434)							
EP2308516-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	106	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	104	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	101	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	95.8	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	102	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	83.7	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	102	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	109	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	78.5	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	78.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	102	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5144434)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5144434) - continued							
EP2308516-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	122	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	108	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	103	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	102	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	111	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	122	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	95.7	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5144434)							
EP2308516-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	110	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	108	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	107	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2308609**	Page	: 1 of 4
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023
Site	: HEHB SD - MB	Issue Date	: 05-Jul-2023
Sampler	: [redacted]	No. of samples received	: 4
Order number	: pfas-omp HEHB	No. of samples analysed	: 4

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0082_SD161_230626, 0082_SD162_230626, 0082_QC106_230626, 0082_SD163_230626	**26-Jun-2023**	**----**	----	----	**04-Jul-2023**	10-Jul-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0082_SD161_230626, 0082_SD162_230626, 0082_QC106_230626, 0082_SD163_230626	**26-Jun-2023**	**30-Jun-2023**	23-Dec-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0082_SD161_230626, 0082_SD162_230626, 0082_QC106_230626, 0082_SD163_230626	**26-Jun-2023**	**30-Jun-2023**	23-Dec-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0082_SD161_230626, 0082_SD162_230626, 0082_QC106_230626, 0082_SD163_230626	**26-Jun-2023**	**30-Jun-2023**	23-Dec-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0082_SD161_230626, 0082_SD162_230626, 0082_QC106_230626, 0082_SD163_230626	**26-Jun-2023**	**30-Jun-2023**	23-Dec-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0082_SD161_230626, 0082_SD162_230626, 0082_QC106_230626, 0082_SD163_230626	**26-Jun-2023**	**30-Jun-2023**	23-Dec-2023	✓	**04-Jul-2023**	09-Aug-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EP2308609**		
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0082_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp HEHB	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53977	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: HEHB SD - MB		
Sampler	: [redacted]		

Dates

Date Samples Received	: 28-Jun-2023 11:20	Issue Date	: 28-Jun-2023
Client Requested Due Date	: 07-Jul-2023	Scheduled Reporting Date	: **07-Jul-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: ----	Temperature	: 6.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2308609-001	26-Jun-2023 13:15	0082_SD161_230626	✓	✓
EP2308609-002	26-Jun-2023 13:38	0082_SD162_230626	✓	✓
EP2308609-003	26-Jun-2023 13:39	0082_QC106_230626	✓	✓
EP2308609-004	26-Jun-2023 13:51	0082_SD163_230626	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted] [redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]cardno.com.au
DERP LAB REPORTS		
- *AU Certificate of Analysis - NATA (COA)	Email	derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB)	Email	derp.labreports@esdat.com.au

[redacted] [redacted]

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

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2308609

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0042-PFASOTP_23 **Client:** STANTEC **Project Manager:** Maelle BOURDAIS

53956 53979 53975 53984 53955 53957

ALS Compass COC Reference: 53958 **# Samples:** 53977 53956 53979 **Phone:** (0448 308 372)

Sampler: JS CG JB

Phone: ( )

Turnaround Requirements: Standard _____ Urgent _____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC			
Date / Time: 27/06/23	Date / Time: 28/6 1120	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: **53977** *ALS Laboratory:* EP Perth

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP_23

SITE: HEHB SD - MB

ORDER NO: pfas-omp

PROJECT MANAGER

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0082_SD161		26/06/2023 01:15 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0082_SD162		26/06/2023 01:38 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0082_QC106		26/06/2023 01:39 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0082_SD163		26/06/2023 01:51 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 53977 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP_23

SITE: HEHB SD - MB

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0082_SD161	HDPE Soil Jar	200 mL	00621222067078	Grey	No	
002	0082_SD162	HDPE Soil Jar	200 mL	00621222067060	Grey	No	
003	0082_QC106	HDPE Soil Jar	200 mL	00621222067064	Grey	No	
004	0082_SD163	HDPE Soil Jar	200 mL	00621222067058	Grey	No	

Total Bottle Count: ALS: 4, Non ALS: 0

CERTIFICATE OF ANALYSIS

Work Order	: **EP2308610**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023 11:20
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 30-Jun-2023
C-O-C number	: 53979	Issue Date	: 07-Jul-2023 17:25
Sampler	: [redacted]		
Site	: HEHB SW/OTH - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Thomas Donovan	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0082_OTH102_230626	0082_OTH103_230626	0082_OTH105_230626	----	----
				Sampling date / time	26-Jun-2023 14:15	26-Jun-2023 14:37	26-Jun-2023 14:55	----	----
Compound	CAS Number	LOR	Unit		EP2308610-001	EP2308610-002	EP2308610-003	--------	--------
					Result	Result	Result	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		333	274	206	----	----
Total Alkalinity as CaCO3	----	1	mg/L		333	274	206	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		2550	2550	2530	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		17700	18000	17800	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		467	480	462	----	----
Magnesium	7439-95-4	1	mg/L		1510	1500	1500	----	----
Sodium	7440-23-5	1	mg/L		11200	11700	11000	----	----
Potassium	7440-09-7	1	mg/L		587	621	584	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		559	566	559	----	----
ø Total Cations	----	0.01	meq/L		650	672	640	----	----
ø Ionic Balance	----	0.01	%		7.50	8.55	6.76	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0082_OTH102_230626	0082_OTH103_230626	0082_OTH105_230626	----	----
				Sampling date / time	26-Jun-2023 14:15	26-Jun-2023 14:37	26-Jun-2023 14:55	----	----
Compound	CAS Number	LOR	Unit		EP2308610-001	EP2308610-002	EP2308610-003	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	<0.05	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0082_OTH102_230626	0082_OTH103_230626	0082_OTH105_230626	----	----
				Sampling date / time	26-Jun-2023 14:15	26-Jun-2023 14:37	26-Jun-2023 14:55	----	----
Compound	CAS Number	LOR	Unit		EP2308610-001	EP2308610-002	EP2308610-003	--------	--------
					Result	Result	Result	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**96.0**	**102**	----	----
13C8-PFOA	----	0.02	%		**94.3**	**96.7**	**92.9**	----	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2308610**	Page	: 1 of 10
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 30-Jun-2023
C-O-C number	: 53979	Issue Date	: 07-Jul-2023
Sampler	: [redacted]		
Site	: HEHB SW/OTH - CG		
Quote number	: SY/139/19 B		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Thomas Donovan	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
ED037P: Alkalinity by PC Titrator (QC Lot: 5144555)									
EP2308608-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	145	144	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	145	144	0.0	0% - 20%
EP2308618-005	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	141	141	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	141	141	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5140872)									
EP2308608-009	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2520	2540	0.6	0% - 20%
EP2308618-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	167	155	7.5	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5140873)									
EP2308608-009	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17600	17400	1.3	0% - 20%
EP2308618-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1260	1260	0.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5140830)									
EP2308610-001	0082_OTH102_230626	ED093F: Calcium	7440-70-2	1	mg/L	467	467	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1510	1510	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11200	11200	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	587	587	0.0	0% - 20%
EP2308618-009	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	7	7	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	7	6	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	209	209	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	33	33	0.0	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5145710)									
EP2308608-005	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5145761)									
EP2308610-003	0082_OTH105_230626	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5145710)									
EP2308608-005	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5145761)									
EP2308610-003	0082_OTH105_230626	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5145710)									
EP2308608-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5145710) - continued									
EP2308608-005	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5145761)									
EP2308610-003	0082_OTH105_230626	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5145710)									
EP2308608-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5145761)									
EP2308610-003	0082_OTH105_230626	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5145761) - continued									
EP2308610-003	0082_OTH105_230626	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5145710)									
EP2308608-005	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5145761)									
EP2308610-003	0082_OTH105_230626	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5144555)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	96.0	87.8	118
				<1	200 mg/L	99.5	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5140872)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	90.7	89.9	112
				<1	500 mg/L	91.6	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5140873)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.3	88.6	113
				<1	1000 mg/L	95.1	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5140830)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.3	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.1	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	95.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.3	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145710)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	102	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	102	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	102	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	104	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145761)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	98.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	106	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	96.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	99.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	97.5	53.0	142

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145710)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	102	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	99.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	96.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	104	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145761)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	94.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	91.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	95.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	93.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145710)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	100	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	102	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	98.0	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	103	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	105	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	100	61.0	135

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145761)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	120	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	95.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	92.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	91.2	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	117	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	104	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145710)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	110	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	120	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	118	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145761)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	97.7	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	117	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	121	64.2	133
EP231P: PFAS Sums (QCLot: 5145710)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5145761)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Matrix Spike (MS) Report

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5140872)							
EP2308608-009	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5140873)							
EP2308608-009	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145710)							
EP2308608-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	93.1	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	102	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	94.4	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	104	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	90.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	98.8	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145710)							
EP2308608-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	104	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	96.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	98.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	96.4	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	94.8	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	114	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	115	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	98.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	126	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	115	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	114	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145710)							
EP2308608-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	96.8	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	92.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	101	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	102	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	112	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	90.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145710)							

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145710) - continued							
EP2308608-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	109	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	104	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	122	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	111	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2308610**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023
Site	: HEHB SW/OTH - CG	Issue Date	: 07-Jul-2023
Sampler	: [redacted]	No. of samples received	: 3
Order number	: pfas-omp HEHB	No. of samples analysed	: 3

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2308608--009	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2308608--009	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	26	7.69	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	26	3.85	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0082_OTH102_230626, 0082_OTH103_230626, 0082_OTH105_230626	**26-Jun-2023**	**----**	----	**----**	**30-Jun-2023**	10-Jul-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0082_OTH102_230626, 0082_OTH103_230626, 0082_OTH105_230626	**26-Jun-2023**	**----**	----	**----**	**07-Jul-2023**	24-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0082_OTH102_230626, 0082_OTH103_230626, 0082_OTH105_230626	**26-Jun-2023**	**----**	----	**----**	**07-Jul-2023**	24-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0082_OTH102_230626, 0082_OTH103_230626, 0082_OTH105_230626	**26-Jun-2023**	**----**	----	**----**	**03-Jul-2023**	03-Jul-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0082_OTH102_230626, 0082_OTH103_230626, 0082_OTH105_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0082_OTH102_230626, 0082_OTH103_230626, 0082_OTH105_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
0082_OTH102_230626, 0082_OTH103_230626, 0082_OTH105_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0082_OTH102_230626, 0082_OTH103_230626, 0082_OTH105_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0082_OTH102_230626, 0082_OTH103_230626, 0082_OTH105_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	26	**7.69**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	26	**7.69**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	26	**3.85**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2308610**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0082_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp HEHB	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53979	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: HEHB SW/OTH - CG		
Sampler	: [redacted]		

Dates

Date Samples Received	: 28-Jun-2023 11:20	Issue Date	: 28-Jun-2023
Client Requested Due Date	: 07-Jul-2023	Scheduled Reporting Date	: **07-Jul-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 6.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 3 / 3

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2308610-001	26-Jun-2023 14:15	0082_OTH102_230626	✓	✓
EP2308610-002	26-Jun-2023 14:37	0082_OTH103_230626	✓	✓
EP2308610-003	26-Jun-2023 14:55	0082_OTH105_230626	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted] [redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]cardno.com.au
DERP LAB REPORTS		
- *AU Certificate of Analysis - NATA (COA)	Email	derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB)	Email	derp.labreports@esdat.com.au

[redacted] [redacted]

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

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2308610

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-00K2-PPA3OTP_23 **Client:** STANTEC **Project Manager:** Maelle BOURDAIS

53956 53979 53975 53984 53955 53957

ALS Compass COC Reference: 53958 **# Samples:** 53977 53956 53979 **Phone:** (0448 308 372)

Sampler: JS CG TB

Phone: ( )

Turnaround Requirements: Standard _____ Urgent _____

Special Instructions:

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
STANTEC			
Date / Time: 27/06/23	Date / Time: 28/6 1120	Date / Time:	Date / Time:

CHAIN OF CUSTODY

(ALS) COC#: 53979 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP_23

SITE: HEHB SW/OTH - CG

ORDER NO: pfas-omp HEHB

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS

ANALYSIS REQUIRED

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0082_OTH102		26/06/2023 02:15 PM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0082_OTH103		26/06/2023 02:37 PM	WATER	ALS: 3 Non ALS: 0	No	X		
003	0082_OTH105		26/06/2023 02:55 PM	WATER	ALS: 5 Non ALS: 0	No	X		Extra lab QAQC PFAS

CHAIN OF CUSTODY

ALS COC#: 53979 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0082_PFASOMP_23

SITE: HEHB SW/OTH - CG

ORDER NO: pfas-omp HEHB

PROJECT MANAGER [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0082_OTH102	HDPE (no PTFE)	20 mL	00350822082191	Grey	No	
001	0082_OTH102	HDPE (no PTFE)	20 mL	00350822082080	Grey	No	
001	0082_OTH102	Clear Plastic Bottle - Natural	125 mL	00071121129866	Green	No	
002	0082_OTH103	HDPE (no PTFE)	20 mL	00350822082218	Grey	No	
002	0082_OTH103	HDPE (no PTFE)	20 mL	00350822082186	Grey	No	
002	0082_OTH103	Clear Plastic Bottle - Natural	125 mL	00071121129683	Green	No	
003	0082_OTH105	HDPE (no PTFE)	20 mL	00350822082216	Grey	No	
003	0082_OTH105	HDPE (no PTFE)	20 mL	00350822082101	Grey	No	
003	0082_OTH105	HDPE (no PTFE)	20 mL	00350621067145	Grey	No	
003	0082_OTH105	HDPE (no PTFE)	20 mL	00350621066863	Grey	No	
003	0082_OTH105	Clear Plastic Bottle - Natural	125 mL	00071121129645	Green	No	

Total Bottle Count: ALS: 11, Non ALS: 0

CERTIFICATE OF ANALYSIS

Work Order	: **EP2308618**	Page	: 1 of 15
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023 11:20
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 30-Jun-2023
C-O-C number	: 53958	Issue Date	: 07-Jul-2023 19:38
Sampler	: [redacted]		
Site	: HEHB GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Thomas Donovan	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- EP231X: Whole bottle extraction was not performed on sample '0082_QC103_230626' (EP2308618-004) due to the provided PFAS sample bottles leaking in transit. analysis was performed on a subsample from the green preserved bottle.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW310_230626	0082_MW311_230626	0082_MW142_230626	0082_QC103_230626	0082_MW103D_230626
				Sampling date / time	26-Jun-2023 09:42	26-Jun-2023 09:56	26-Jun-2023 10:13	26-Jun-2023 10:14	26-Jun-2023 10:33
Compound	CAS Number	LOR	Unit		EP2308618-001	EP2308618-002	EP2308618-003	EP2308618-004	EP2308618-005
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		1050	174	436	410	141
Total Alkalinity as CaCO3	----	1	mg/L		1050	174	436	410	141
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		342	21	216	215	167
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		536	30	1430	1450	1260
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		23	32	159	166	231
Magnesium	7439-95-4	1	mg/L		40	12	133	139	129
Sodium	7440-23-5	1	mg/L		707	39	848	867	548
Potassium	7440-09-7	1	mg/L		52	18	58	61	26
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		43.2	4.76	53.5	53.6	41.8
ø Total Cations	----	0.01	meq/L		36.5	4.74	57.2	59.0	46.6
ø Ionic Balance	----	0.01	%		8.40	0.20	3.34	4.82	5.43
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		5.29	<0.02	0.07	0.06	0.22
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		6.41	<0.02	0.07	0.06	0.28
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		11.1	0.11	0.79	0.78	2.35
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.21	<0.02	0.13	0.14	0.12
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		2.02	0.22	8.04	10.7	2.00
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		3.3	<0.1	0.2	0.2	0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		6.93	<0.02	0.52	0.54	0.21
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		15.6	<0.02	0.49	0.52	0.56

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0082_MW310_230626	0082_MW311_230626	0082_MW142_230626	0082_QC103_230626	0082_MW103D_230626
				Sampling date / time	26-Jun-2023 09:42	26-Jun-2023 09:56	26-Jun-2023 10:13	26-Jun-2023 10:14	26-Jun-2023 10:33
					EP2308618-001	EP2308618-002	EP2308618-003	EP2308618-004	EP2308618-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**2.22**	<0.02	**0.22**	**0.24**	**0.07**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.31**	**0.01**	**0.22**	**0.21**	**0.06**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	**0.06**	**0.06**	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.58**	<0.05	**2.13**	**2.02**	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW310_230626	0082_MW311_230626	0082_MW142_230626	0082_QC103_230626	0082_MW103D_230626
				Sampling date / time	26-Jun-2023 09:42	26-Jun-2023 09:56	26-Jun-2023 10:13	26-Jun-2023 10:14	26-Jun-2023 10:33
Compound	CAS Number	LOR	Unit		EP2308618-001	EP2308618-002	EP2308618-003	EP2308618-004	EP2308618-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**54.0**	**0.34**	**12.9**	**15.5**	**5.97**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**13.1**	**0.33**	**8.83**	**11.5**	**4.35**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**47.4**	**0.34**	**12.7**	**15.3**	**5.57**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.1**	**104**	**87.9**	**111**	**94.9**
13C8-PFOA	----	0.02	%		**97.0**	**105**	**96.8**	**103**	**103**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW115_230626	0082_MW315_230626	0082_QC104_230626	0082_MW143_230626	0082_MW113_230626
				Sampling date / time	26-Jun-2023 10:45	26-Jun-2023 10:50	26-Jun-2023 10:54	26-Jun-2023 11:09	26-Jun-2023 11:49
Compound	CAS Number	LOR	Unit		EP2308618-006	EP2308618-007	EP2308618-008	EP2308618-009	EP2308618-010
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		----	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		----	<1	**2**	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		----	**808**	**789**	**440**	**653**
Total Alkalinity as CaCO3	----	1	mg/L		----	**808**	**791**	**440**	**653**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	**12**	**14**	**40**	**166**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	**47**	**49**	**105**	**535**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	**2**	**2**	**7**	**15**
Magnesium	7439-95-4	1	mg/L		----	**3**	**3**	**7**	**20**
Sodium	7440-23-5	1	mg/L		----	**325**	**328**	**209**	**580**
Potassium	7440-09-7	1	mg/L		----	**24**	**25**	**33**	**41**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		----	**17.7**	**17.5**	**12.6**	**31.6**
ø Total Cations	----	0.01	meq/L		----	**15.1**	**15.2**	**10.9**	**28.7**
ø Ionic Balance	----	0.01	%		----	**7.99**	**6.80**	**7.36**	**4.85**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.15**	<0.02	<0.02	**0.03**	**0.02**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.23**	<0.02	<0.02	**0.04**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**3.04**	<0.01	<0.01	**0.40**	**0.13**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.17**	<0.02	<0.02	**0.09**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**8.66**	<0.01	<0.01	**4.70**	**0.04**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**1.0**	<0.1	<0.1	**0.4**	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**2.68**	<0.02	<0.02	**0.98**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**2.61**	<0.02	<0.02	**0.88**	<0.02

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW115_230626	0082_MW315_230626	0082_QC104_230626	0082_MW143_230626	0082_MW113_230626
				Sampling date / time	26-Jun-2023 10:45	26-Jun-2023 10:50	26-Jun-2023 10:54	26-Jun-2023 11:09	26-Jun-2023 11:49
Compound	CAS Number	LOR	Unit		EP2308618-006	EP2308618-007	EP2308618-008	EP2308618-009	EP2308618-010
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**1.48**	<0.02	<0.02	**0.71**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.42**	<0.01	<0.01	**0.52**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.05**	<0.02	<0.02	**0.02**	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.49**	<0.05	<0.05	**1.34**	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW115_230626	0082_MW315_230626	0082_QC104_230626	0082_MW143_230626	0082_MW113_230626
				Sampling date / time	26-Jun-2023 10:45	26-Jun-2023 10:50	26-Jun-2023 10:54	26-Jun-2023 11:09	26-Jun-2023 11:49
Compound	CAS Number	LOR	Unit		EP2308618-006	EP2308618-007	EP2308618-008	EP2308618-009	EP2308618-010
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**21.0**	<0.01	<0.01	**10.1**	**0.19**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**11.7**	<0.01	<0.01	**5.10**	**0.17**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**20.5**	<0.01	<0.01	**9.96**	**0.19**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**91.0**	**92.0**	**95.7**	**91.1**	**99.1**
13C8-PFOA	----	0.02	%		**97.8**	**98.3**	**96.7**	**99.4**	**95.3**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0082_MW118D_230626	0082_MW022_230626	0082_MW154S_230626	0082_MW155S_230626	0082_MW137_6.1-6.6_230626
				Sampling date / time	26-Jun-2023 12:10	26-Jun-2023 12:25	26-Jun-2023 13:08	26-Jun-2023 13:50	26-Jun-2023 14:04
					EP2308618-011	EP2308618-012	EP2308618-013	EP2308618-014	EP2308618-015
					Result	Result	Result	Result	Result
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**548**	**380**	**525**	**530**	**442**
Total Alkalinity as CaCO3	----	1	mg/L		**548**	**380**	**525**	**530**	**442**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**148**	**14**	**1360**	**1140**	**794**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**956**	**40**	**8310**	**7470**	**6320**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**14**	**50**	**334**	**349**	**270**
Magnesium	7439-95-4	1	mg/L		**25**	**31**	**609**	**582**	**469**
Sodium	7440-23-5	1	mg/L		**875**	**59**	**5070**	**4570**	**3760**
Potassium	7440-09-7	1	mg/L		**59**	**20**	**236**	**191**	**143**
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**41.0**	**9.01**	**273**	**245**	**204**
ø **Total Cations**	----	0.01	meq/L		**42.3**	**8.12**	**293**	**269**	**219**
ø **Ionic Balance**	----	0.01	%		**1.59**	**5.18**	**3.55**	**4.66**	**3.70**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.32**	**0.03**	**0.21**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.31**	**0.05**	**0.21**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.66**	**0.55**	**0.98**	<0.01	**0.01**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.27**	**0.03**	**0.05**	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**8.62**	**3.34**	**0.74**	<0.01	**0.06**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.4**	**0.1**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.67**	**0.26**	**0.21**	<0.02	**0.06**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.93**	**0.30**	**0.23**	<0.02	**0.06**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)

Compound	CAS Number	LOR	Unit	Sample ID	0082_MW118D_230626	0082_MW022_230626	0082_MW154S_230626	0082_MW155S_230626	0082_MW137_6.1-6.6_230626
				Sampling date / time	26-Jun-2023 12:10	26-Jun-2023 12:25	26-Jun-2023 13:08	26-Jun-2023 13:50	26-Jun-2023 14:04
					EP2308618-011	EP2308618-012	EP2308618-013	EP2308618-014	EP2308618-015
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.30**	**0.26**	**0.08**	<0.02	**0.03**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.58**	**0.21**	**0.07**	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.14**	**0.16**	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**4.35**	<0.05	<0.05	<0.05	**1.06**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW118D_230626	0082_MW022_230626	0082_MW154S_230626	0082_MW155S_230626	0082_MW137_6.1-6.6_230626
				Sampling date / time	26-Jun-2023 12:10	26-Jun-2023 12:25	26-Jun-2023 13:08	26-Jun-2023 13:50	26-Jun-2023 14:04
Compound	CAS Number	LOR	Unit		EP2308618-011	EP2308618-012	EP2308618-013	EP2308618-014	EP2308618-015
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		**0.08**	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**18.6**	**5.29**	**2.78**	<0.01	**1.28**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**10.3**	**3.89**	**1.72**	<0.01	**0.07**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**17.9**	**5.05**	**2.52**	<0.01	**1.28**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**91.9**	**95.6**	**105**	**112**
13C8-PFOA	----	0.02	%		**102**	**94.7**	**96.7**	**101**	**95.7**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW133_3.0-3.5_230626	----	----	----	----
				Sampling date / time	26-Jun-2023 14:43	----	----	----	----
Compound	CAS Number	LOR	Unit	EP2308618-016	--------	--------	--------	--------	
				Result	----	----	----	----	
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	**346**	----	----	----	----	
Total Alkalinity as CaCO3	----	1	mg/L	**346**	----	----	----	----	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2270**	----	----	----	----	
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L	**16000**	----	----	----	----	
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L	**482**	----	----	----	----	
Magnesium	7439-95-4	1	mg/L	**1260**	----	----	----	----	
Sodium	7440-23-5	1	mg/L	**10100**	----	----	----	----	
Potassium	7440-09-7	1	mg/L	**532**	----	----	----	----	
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L	**506**	----	----	----	----	
ø Total Cations	----	0.01	meq/L	**581**	----	----	----	----	
ø Ionic Balance	----	0.01	%	**6.92**	----	----	----	----	
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	----	----	----	----	
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	----	----	----	----	
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	----	----	----	----	
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	----	----	----	----	
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	**0.03**	----	----	----	----	
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	----	----	----	----	
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	----	----	----	----	
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	----	----	----	----	
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	----	----	----	----	

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW133_3.0-3.5_230626	----	----	----	----
				Sampling date / time	26-Jun-2023 14:43	----	----	----	----
Compound	CAS Number	LOR	Unit		EP2308618-016	--------	--------	--------	--------
					Result	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0082_MW133_3.0-3.5_230626	----	----	----	----
				Sampling date / time	26-Jun-2023 14:43	----	----	----	----
Compound	CAS Number	LOR	Unit	EP2308618-016	--------	--------	--------	--------	
				Result	----	----	----	----	
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	----	----	----	----	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	----	----	----	----	
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L	**0.03**	----	----	----	----	
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	**0.03**	----	----	----	----	
Sum of PFAS (WA DER List)	----	0.01	µg/L	**0.03**	----	----	----	----	
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%	**102**	----	----	----	----	
13C8-PFOA	----	0.02	%	**95.0**	----	----	----	----	

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2308618**	Page	: 1 of 11
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 30-Jun-2023
C-O-C number	: 53958	Issue Date	: 07-Jul-2023
Sampler	: [redacted]		
Site	: HEHB GW - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 16		
No. of samples analysed	: 16		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Canhuang Ke	Inorganics Supervisor	Perth Inorganics, Wangara, WA
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Thomas Donovan	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5144555)									
EP2308608-009	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	145	144	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	145	144	0.0	0% - 20%
EP2308618-005	0082_MW103D_230626	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	141	141	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	141	141	0.0	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 5144556)									
EP2308652-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	82	82	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	82	82	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5140872)									
EP2308608-009	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2520	2540	0.6	0% - 20%
EP2308618-005	0082_MW103D_230626	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	167	155	7.5	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5140874)									
EP2308605-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	6	6	0.0	No Limit
EP2308645-027	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	16200	15800	1.9	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5140873)									
EP2308608-009	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	17600	17400	1.3	0% - 20%
EP2308618-005	0082_MW103D_230626	ED045G: Chloride	16887-00-6	1	mg/L	1260	1260	0.4	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5140875)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED045G: Chloride by Discrete Analyser (QC Lot: 5140875) - continued									
EP2308605-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	76	78	2.5	0% - 20%
EP2308645-027	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	108000	110000	1.4	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5140830)									
EP2308610-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	467	467	0.0	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1510	1510	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11200	11200	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	587	587	0.0	0% - 20%
EP2308618-009	0082_MW143_230626	ED093F: Calcium	7440-70-2	1	mg/L	7	7	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	7	6	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	209	209	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	33	33	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5145706)									
EP2308618-002	0082_MW311_230626	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.11	0.10	0.0	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.22	0.21	0.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5145761)									
EP2308610-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5145706)									
EP2308618-002	0082_MW311_230626	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5145761)									
EP2308610-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5145761) - continued									
EP2308610-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5145706)									
EP2308618-002	0082_MW311_230626	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5145761)									
EP2308610-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5145706)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5145706) - continued									
EP2308618-002	0082_MW311_230626	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5145761)									
EP2308610-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5145706)									
EP2308618-002	0082_MW311_230626	EP231X: Sum of PFAS	----	0.01	µg/L	0.34	0.31	9.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.33	0.31	6.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.34	0.31	9.2	0% - 20%
EP231P: PFAS Sums (QC Lot: 5145761)									
EP2308610-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5144555)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	96.0	87.8	118
				<1	200 mg/L	99.5	87.8	118
ED037P: Alkalinity by PC Titrator (QCLot: 5144556)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.6	87.8	118
				<1	200 mg/L	101	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5140872)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	90.7	89.9	112
				<1	500 mg/L	91.6	89.9	112
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5140874)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	106	89.9	112
				<1	500 mg/L	92.2	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5140873)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.3	88.6	113
				<1	1000 mg/L	95.1	88.6	113
ED045G: Chloride by Discrete Analyser (QCLot: 5140875)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.9	88.6	113
				<1	1000 mg/L	95.8	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5140830)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.3	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.1	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	95.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.3	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145706)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145706) - continued								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	103	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	103	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	99.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	88.9	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	104	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	87.3	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145761)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	98.7	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	106	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	96.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	99.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	97.5	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5150001)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	101	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	95.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	100	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	103	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	113	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145706)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	114	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	95.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	98.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	96.0	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	118	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	102	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	98.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	106	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145761)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.3	73.0	129

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145761) - continued								
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	94.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	97.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	91.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	95.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	85.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	93.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5150001)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	97.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	99.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	99.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	102	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	98.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	95.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	90.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	95.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145706)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	115	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	97.1	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.8	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	92.8	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	115	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	109	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145761)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Acceptable Limits (%)
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145761) - continued								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	120	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	95.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	92.8	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	91.2	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	117	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	104	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5150001)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	93.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	102	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	88.7	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	93.7	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	104	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	111	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145706)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	116	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	107	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	101	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	82.4	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145761)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	97.7	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	104	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	117	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	121	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5150001)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	111	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	96.7	64.0	140

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5150001) - continued								
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	126	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	101	64.2	133
EP231P: PFAS Sums (QCLot: 5145706)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5145761)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 5150001)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5140872)							
EP2308608-009	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5140874)							
EP2308602-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5140873)							
EP2308608-009	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 5140875)							
EP2308605-001	Anonymous	ED045G: Chloride	16887-00-6	1000 mg/L	95.7	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145706)							
EP2308618-014	0082_MW155S_230626	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	109	72.0	129
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.232 µg/L	108	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	93.6	68.0	129
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	96.2	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	104	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	103	53.0	129
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145706)							
EP2308618-014	0082_MW155S_230626	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	112	73.0	142
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	100	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	92.4	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	97.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	102	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	103	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	102	71.0	134
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	94.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	94.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.25 µg/L	103	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145706)							
EP2308618-014	0082_MW155S_230626	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	107	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	102	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	80.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	97.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	92.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	120	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	106	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145706)							
EP2308618-014	0082_MW155S_230626	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	101	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	98.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	104	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	104	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2308618**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023
Site	: HEHB GW - JS	Issue Date	: 07-Jul-2023
Sampler	: [redacted]	No. of samples received	: 16
Order number	: pfas-omp HEHB	No. of samples analysed	: 16

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2308608--009	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2308602--004	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2308608--009	Anonymous	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
	2				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	27	7.41	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	27	3.70	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method	***Sample Date***	*Extraction / Preparation*			*Analysis*		
Container / *Client Sample ID(s)*		***Date extracted***	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0082_MW310_230626, 0082_MW311_230626, 0082_MW142_230626, 0082_QC103_230626, 0082_MW103D_230626, 0082_MW315_230626, 0082_QC104_230626, 0082_MW143_230626, 0082_MW113_230626, 0082_MW118D_230626, 0082_MW022_230626, 0082_MW154S_230626, 0082_MW155S_230626, 0082_MW137_6.1-6.6_230626, 0082_MW133_3.0-3.5_230626	**26-Jun-2023**	**----**	----	**----**	**30-Jun-2023**	10-Jul-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0082_MW133_3.0-3.5_230626	**26-Jun-2023**	**----**	----	**----**	**03-Jul-2023**	24-Jul-2023	✓
Clear Plastic Bottle - Natural (ED041G)							
0082_MW310_230626, 0082_MW311_230626, 0082_MW142_230626, 0082_QC103_230626, 0082_MW103D_230626, 0082_MW315_230626, 0082_QC104_230626, 0082_MW143_230626, 0082_MW113_230626, 0082_MW118D_230626, 0082_MW022_230626, 0082_MW154S_230626, 0082_MW155S_230626, 0082_MW137_6.1-6.6_230626	**26-Jun-2023**	**----**	----	**----**	**07-Jul-2023**	24-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0082_MW133_3.0-3.5_230626	**26-Jun-2023**	**----**	----	**----**	**03-Jul-2023**	24-Jul-2023	✓
Clear Plastic Bottle - Natural (ED045G)							
0082_MW310_230626, 0082_MW311_230626, 0082_MW142_230626, 0082_QC103_230626, 0082_MW103D_230626, 0082_MW315_230626, 0082_QC104_230626, 0082_MW143_230626, 0082_MW113_230626, 0082_MW118D_230626, 0082_MW022_230626, 0082_MW154S_230626, 0082_MW155S_230626, 0082_MW137_6.1-6.6_230626	**26-Jun-2023**	**----**	----	**----**	**07-Jul-2023**	24-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0082_MW310_230626, 0082_MW311_230626, 0082_MW142_230626, 0082_QC103_230626, 0082_MW103D_230626, 0082_MW315_230626, 0082_QC104_230626, 0082_MW143_230626, 0082_MW113_230626, 0082_MW118D_230626, 0082_MW022_230626, 0082_MW154S_230626, 0082_MW155S_230626, 0082_MW137_6.1-6.6_230626, 0082_MW133_3.0-3.5_230626	**26-Jun-2023**	**----**	----	**----**	**03-Jul-2023**	03-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0082_MW310_230626, 0082_MW142_230626, 0082_MW115_230626, 0082_MW315_230626, 0082_QC104_230626, 0082_MW143_230626, 0082_MW113_230626, 0082_MW022_230626, 0082_MW154S_230626, 0082_MW137_6.1-6.6_230626, 0082_MW133_3.0-3.5_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW311_230626, 0082_MW103D_230626, 0082_MW118D_230626, 0082_MW155S_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_QC103_230626	**26-Jun-2023**	**04-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0082_MW310_230626, 0082_MW142_230626, 0082_MW115_230626, 0082_MW315_230626, 0082_QC104_230626, 0082_MW143_230626, 0082_MW113_230626, 0082_MW022_230626, 0082_MW154S_230626, 0082_MW137_6.1-6.6_230626, 0082_MW133_3.0-3.5_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW311_230626, 0082_MW103D_230626, 0082_MW118D_230626, 0082_MW155S_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_QC103_230626	**26-Jun-2023**	**04-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0082_MW310_230626, 0082_MW142_230626, 0082_MW115_230626, 0082_MW315_230626, 0082_QC104_230626, 0082_MW143_230626, 0082_MW113_230626, 0082_MW022_230626, 0082_MW154S_230626, 0082_MW137_6.1-6.6_230626, 0082_MW133_3.0-3.5_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW311_230626, 0082_MW103D_230626, 0082_MW118D_230626, 0082_MW155S_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_QC103_230626	**26-Jun-2023**	**04-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0082_MW310_230626, 0082_MW142_230626, 0082_MW115_230626, 0082_MW315_230626, 0082_QC104_230626, 0082_MW143_230626, 0082_MW113_230626, 0082_MW022_230626, 0082_MW154S_230626, 0082_MW137_6.1-6.6_230626, 0082_MW133_3.0-3.5_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW311_230626, 0082_MW103D_230626, 0082_MW118D_230626, 0082_MW155S_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_QC103_230626	**26-Jun-2023**	**04-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0082_MW310_230626, 0082_MW142_230626, 0082_MW115_230626, 0082_MW315_230626, 0082_QC104_230626, 0082_MW143_230626, 0082_MW113_230626, 0082_MW022_230626, 0082_MW154S_230626, 0082_MW137_6.1-6.6_230626, 0082_MW133_3.0-3.5_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_MW311_230626, 0082_MW103D_230626, 0082_MW118D_230626, 0082_MW155S_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓
HDPE (no PTFE) (EP231X) 0082_QC103_230626	**26-Jun-2023**	**04-Jul-2023**	23-Dec-2023	✓	**05-Jul-2023**	23-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	3	30	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	27	**7.41**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	4	30	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	4	37	**10.81**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	27	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	4	40	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	2	30	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	27	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	2	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	27	**3.70**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	40	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2308618**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0082_PFASOMP_23	Page	: 1 of 3
Order number	: pfas-omp HEHB	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53958	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: HEHB GW - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 28-Jun-2023 11:20	Issue Date	: 29-Jun-2023
Client Requested Due Date	: 07-Jul-2023	Scheduled Reporting Date	: **07-Jul-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 6.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 16 / 16

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Any sample identifications that cannot be displayed entirely in the analysis summary table will be listed below.

EP2308618-015 : 26-Jun-2023 14:04 : 0082_MW137_6.1-6.6_230626
EP2308618-016 : 26-Jun-2023 14:43 : 0082_MW133_3.0-3.5_230626

Summary of Sample(s) and Requested Analysis

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

Matrix: **WATER**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2308618-001	26-Jun-2023 09:42	0082_MW310_230626	✓	✓
EP2308618-002	26-Jun-2023 09:56	0082_MW311_230626	✓	✓
EP2308618-003	26-Jun-2023 10:13	0082_MW142_230626	✓	✓
EP2308618-004	26-Jun-2023 10:14	0082_QC103_230626	✓	✓
EP2308618-005	26-Jun-2023 10:33	0082_MW103D_230626	✓	✓
EP2308618-006	26-Jun-2023 10:45	0082_MW115_230626	✓	
EP2308618-007	26-Jun-2023 10:50	0082_MW315_230626	✓	✓
EP2308618-008	26-Jun-2023 10:54	0082_QC104_230626	✓	✓
EP2308618-009	26-Jun-2023 11:09	0082_MW143_230626	✓	✓
EP2308618-010	26-Jun-2023 11:49	0082_MW113_230626	✓	✓
EP2308618-011	26-Jun-2023 12:10	0082_MW118D_230626	✓	✓
EP2308618-012	26-Jun-2023 12:25	0082_MW022_230626	✓	✓
EP2308618-013	26-Jun-2023 13:08	0082_MW154S_230626	✓	✓
EP2308618-014	26-Jun-2023 13:50	0082_MW155S_230626	✓	✓
EP2308618-015	26-Jun-2023 14:04	0082_MW137_6.1-6.6_2...	✓	✓
EP2308618-016	26-Jun-2023 14:43	0082_MW133_3.0-3.5_2...	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]cardno.com.au

DERP LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB)	Email	derp.labreports@esdat.com.au

[redacted]

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

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2308618

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0042-PFASOTP_23 **Client:** STANTEC **Project Manager:** Maella Bourgeois

53956 53979 53975 53984 53955 53957

ALS Compass COC Reference: 53958 **# Samples:** 53977 53956 [illegible] **Phone:** (0448 308 372)

Sampler: JS CG JB

Phone: ( )

Turnaround Requirements: Standard _____ Urgent _____

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by:	Relinquished by:	Received by:
Date / Time: 27/06/23	Date / Time: 28/6 1120	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 53958 *ALS Laboratory:* EP Perth

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0083_PFASOMP_23

SITE: HEHA GW - JS

ORDER NO: pfas-omp

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal Intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0082_MW310		26/06/2023 09:42 AM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0082_MW311		26/06/2023 09:56 AM	WATER	ALS: 5 Non ALS: 0	No	X		
003	0082_MW142		26/06/2023 10:13 AM	WATER	ALS: 3 Non ALS: 0	No	X		
004	0082_QC103		26/06/2023 10:14 AM	WATER	ALS: 3 Non ALS: 0	No	X		
005	0082_MW103D		26/06/2023 10:33 AM	WATER	ALS: 3 Non ALS: 0	No	X		
006	0082_MW115	Not enough volume for cation/anions	26/06/2023 10:45 AM	WATER	ALS: 3 Non ALS: 0	No	X		
007	0082_MW315		26/06/2023 10:50 AM	WATER	ALS: 3 Non ALS: 0	No	X		
008	0082_QC104		26/06/2023 10:54 AM	WATER	ALS: 3 Non ALS: 0	No	X		
009	0082_MW143		26/06/2023 11:09 AM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 53958 ALS Laboratory: EP Perth

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0083_PFASOMP_23

SITE: HEHA GW - JS

ORDER NO: pfas-omp

PROJECT MANAGER

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0082_MW113		26/06/2023 11:49 AM	WATER	ALS: 3 Non ALS: 0	No	X		
011	0082_MW118D		26/06/2023 12:10 PM	WATER	ALS: 5 Non ALS: 0	No	X		
012	0082_MW022		26/06/2023 12:25 PM	WATER	ALS: 3 Non ALS: 0	No	X		
013	0082_MW154S		26/06/2023 01:08 PM	WATER	ALS: 3 Non ALS: 0	No	X		
014	0082_MW155S		26/06/2023 01:50 PM	WATER	ALS: 5 Non ALS: 0	No	X		
015	0082_MW137_6.1-6.6		26/06/2023 02:04 PM	WATER	ALS: 3 Non ALS: 0	No	X		
016	0082_MW133_3.0-3.5		26/06/2023 02:43 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 53958 *ALS Laboratory:* EP Perth

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0083_PFASOMP_23

SITE: HEHA GW - JS

ORDER NO: pfas-omp[redacted]

PROJECT MANAGER[redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO

EMAIL INVOICES TO

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0082_MW310	Clear Plastic Bottle - Natural	125 mL	00071121129698	Green	No	
001	0082_MW310	HDPE (no PTFE)	20 mL	00350822000525	Grey	No	
001	0082_MW310	HDPE (no PTFE)	20 mL	00350822000546	Grey	No	
002	0082_MW311	HDPE (no PTFE)	20 mL	00350822000320	Grey	No	
002	0082_MW311	HDPE (no PTFE)	20 mL	00350822000442	Grey	No	
002	0082_MW311	Clear Plastic Bottle - Natural	125 mL	00071121129757	Green	No	
002	0082_MW311	HDPE (no PTFE)	20 mL	00350822000380	Grey	No	
002	0082_MW311	HDPE (no PTFE)	20 mL	00350822000467	Grey	No	
003	0082_MW142	Clear Plastic Bottle - Natural	125 mL	00071121129736	Green	No	
003	0082_MW142	HDPE (no PTFE)	20 mL	00350822000548	Grey	No	
003	0082_MW142	HDPE (no PTFE)	20 mL	00350822000417	Grey	No	
004	0082_QC103	Clear Plastic Bottle - Natural	125 mL	00071121129640	Green	No	
004	0082_QC103	HDPE (no PTFE)	20 mL	00350822000358	Grey	No	
004	0082_QC103	HDPE (no PTFE)	20 mL	00350822000474	Grey	No	
005	0082_MW103D	HDPE (no PTFE)	20 mL	00350822000521	Grey	No	
005	0082_MW103D	HDPE (no PTFE)	20 mL	00350822000541	Grey	No	
005	0082_MW103D	Clear Plastic Bottle - Natural	125 mL	00071121129866	Green	No	
006	0082_MW115	HDPE (no PTFE)	20 mL	00350822000364	Grey	No	
006	0082_MW115	HDPE (no PTFE)	20 mL	00350822000604	Grey	No	
006	0082_MW115	Clear Plastic Bottle - Natural	125 mL	00071121129658	Green	No	
007	0082_MW315	Clear Plastic Bottle - Natural	125 mL	00071121129671	Green	No	
007	0082_MW315	HDPE (no PTFE)	20 mL	00350822000481	Grey	No	
007	0082_MW315	HDPE (no PTFE)	20 mL	00350822000471	Grey	No	
008	0082_QC104	Clear Plastic Bottle - Natural	125 mL	00071121129779	Green	No	
008	0082_QC104	HDPE (no PTFE)	20 mL	00350822000603	Grey	No	
008	0082_QC104	HDPE (no PTFE)	20 mL	00350822000462	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 53958 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0083_PFASOMP_23

SITE: HEHA GW - JS

ORDER NO: pfas-omp HEHA

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

009	0082_MW143	HDPE (no PTFE)	20 mL	00350822000448	Grey	No	
009	0082_MW143	HDPE (no PTFE)	20 mL	00350822000397	Grey	No	
009	0082_MW143	Clear Plastic Bottle - Natural	125 mL	00071121129701	Green	No	
010	0082_MW113	HDPE (no PTFE)	20 mL	00350822000503	Grey	No	
010	0082_MW113	HDPE (no PTFE)	20 mL	00350822000575	Grey	No	
010	0082_MW113	Clear Plastic Bottle - Natural	125 mL	00071121129663	Green	No	
011	0082_MW118D	HDPE (no PTFE)	20 mL	00350822000561	Grey	No	
011	0082_MW118D	HDPE (no PTFE)	20 mL	00350822000438	Grey	No	
011	0082_MW118D	Clear Plastic Bottle - Natural	125 mL	00071121129705	Green	No	
011	0082_MW118D	HDPE (no PTFE)	20 mL	00350822000506	Grey	No	
011	0082_MW118D	HDPE (no PTFE)	20 mL	00350822000431	Grey	No	
012	0082_MW022	Clear Plastic Bottle - Natural	125 mL	00071121129764	Green	No	
012	0082_MW022	HDPE (no PTFE)	20 mL	00350822000316	Grey	No	
012	0082_MW022	HDPE (no PTFE)	20 mL	00350822000403	Grey	No	
013	0082_MW154S	Clear Plastic Bottle - Natural	125 mL	00071121129874	Green	No	
013	0082_MW154S	HDPE (no PTFE)	20 mL	00350822000493	Grey	No	
013	0082_MW154S	HDPE (no PTFE)	20 mL	00350822000497	Grey	No	
014	0082_MW155S	HDPE (no PTFE)	20 mL	00350821001804	Grey	No	
014	0082_MW155S	HDPE (no PTFE)	20 mL	00350821001725	Grey	No	
014	0082_MW155S	Clear Plastic Bottle - Natural	125 mL	00071121129631	Green	No	
014	0082_MW155S	HDPE (no PTFE)	20 mL	00350822000414	Grey	No	
014	0082_MW155S	HDPE (no PTFE)	20 mL	00350822000461	Grey	No	
015	0082_MW137_6.1-6.6	HDPE (no PTFE)	20 mL	00350821001802	Grey	No	
015	0082_MW137_6.1-6.6	HDPE (no PTFE)	20 mL	00350821001695	Grey	No	
015	0082_MW137_6.1-6.6	Clear Plastic Bottle - Natural	125 mL	00070522145027	Green	No	
016	0082_MW133_3.0-3.5	HDPE (no PTFE)	20 mL	00350822000624	Grey	No	
016	0082_MW133_3.0-3.5	HDPE (no PTFE)	20 mL	00350822000595	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 53958 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0083_PFASOMP_23

SITE: HEHA GW - JS

ORDER NO: pfas-omp HEHA

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	

Other comments:

016	0082_MW133_3.0-3.5	Clear Plastic Bottle - Natural	125 mL	00071121129700	Green	No	

Total Bottle Count: ALS: 54, Non ALS: 0

CERTIFICATE OF ANALYSIS

Work Order	: **EP2308619**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023 11:20
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 30-Jun-2023
C-O-C number	: 53975	Issue Date	: 05-Jul-2023 16:52
Sampler	: [redacted]		
Site	: HEHB SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Thomas Donovan	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

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

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

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

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0082_SD164_230626	0082_QC105_230626	0082_SS165_230626	0082_SS167_230626	0082_SS171_230626
				Sampling date / time	26-Jun-2023 12:28	26-Jun-2023 12:29	26-Jun-2023 12:53	26-Jun-2023 13:22	26-Jun-2023 13:28
Compound	CAS Number	LOR	Unit		EP2308619-001	EP2308619-002	EP2308619-003	EP2308619-004	EP2308619-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**2.7**	**4.0**	**1.7**	**2.1**	**1.0**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0005**	**0.0004**	**0.0052**	<0.0002	**0.0010**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	**0.0003**	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0082_SD164_230626	0082_QC105_230626	0082_SS165_230626	0082_SS167_230626	0082_SS171_230626
				Sampling date / time	26-Jun-2023 12:28	26-Jun-2023 12:29	26-Jun-2023 12:53	26-Jun-2023 13:22	26-Jun-2023 13:28
Compound	CAS Number	LOR	Unit		EP2308619-001	EP2308619-002	EP2308619-003	EP2308619-004	EP2308619-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0005**	**0.0004**	**0.0055**	<0.0002	**0.0010**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0005**	**0.0004**	**0.0052**	<0.0002	**0.0010**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0005**	**0.0004**	**0.0052**	<0.0002	**0.0010**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**93.5**	**112**	**89.5**	**106**	**104**
13C8-PFOA	----	0.0002	%		**95.5**	**100**	**98.0**	**100**	**102**

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0082_SS169_230626	0082_SS173_230626	0082_SS179_230626	0082_SD181_230626	----
				Sampling date / time	26-Jun-2023 13:29	26-Jun-2023 14:42	26-Jun-2023 14:43	26-Jun-2023 15:18	----
Compound	CAS Number	LOR	Unit		EP2308619-006	EP2308619-007	EP2308619-008	EP2308619-009	--------
					Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**0.9**	**1.8**	**8.4**	**22.7**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----

Analytical Results

Sub-Matrix: SEDIMENT (Matrix: SOIL)				Sample ID	0082_SS169_230626	0082_SS173_230626	0082_SS179_230626	0082_SD181_230626	----
				Sampling date / time	26-Jun-2023 13:29	26-Jun-2023 14:42	26-Jun-2023 14:43	26-Jun-2023 15:18	----
Compound	CAS Number	LOR	Unit		EP2308619-006	EP2308619-007	EP2308619-008	EP2308619-009	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**107**	**102**	**102**	**104**	----
13C8-PFOA	----	0.0002	%		**93.0**	**102**	**109**	**112**	----

Surrogate Control Limits

Sub-Matrix: **SEDIMENT**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

QUALITY CONTROL REPORT

Work Order	: **EP2308619**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 30-Jun-2023
C-O-C number	: 53975	Issue Date	: 05-Jul-2023
Sampler	: [redacted]		
Site	: HEHB SD - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 9		
No. of samples analysed	: 9		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Thomas Donovan	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5149805)									
EP2308503-010	Anonymous	EA055: Moisture Content	----	0.1	%	9.8	8.9	9.4	0% - 20%
EP2308619-003	0082_SS165_230626	EA055: Moisture Content	----	0.1	%	1.7	1.6	0.0	0% - 50%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5144434)									
EP2308516-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP2308619-003	0082_SS165_230626	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0052	0.0063	18.8	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5144434)									
EP2308516-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0002	0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5144434) - continued									
EP2308516-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP2308619-003	0082_SS165_230626	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5144434)									
EP2308516-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2308619-003	0082_SS165_230626	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5144434)									
EP2308516-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	0.0013	0.0014	12.8	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP2308619-003	0082_SS165_230626	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5144434)									
EP2308516-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0015	0.0016	6.5	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0015	0.0016	6.5	No Limit
EP2308619-003	0082_SS165_230626	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0055	0.0066	18.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0052	0.0063	19.1	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0052	0.0063	19.1	0% - 20%

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5144434)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	96.4	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	97.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	86.6	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	111	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	105	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5144434)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	110	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	107	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00125 mg/kg	97.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5144434)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.1	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.8	61.9	139
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5144434)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5144434) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	108	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	103	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	112	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	107	54.8	124
EP231P: PFAS Sums (QCLot: 5144434)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5144434)							
EP2308516-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	99.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	103	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	92.7	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	96.3	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	94.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	87.9	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5144434)							
EP2308516-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	106	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	104	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	101	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	95.8	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	102	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	83.7	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	102	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	109	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	78.5	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	78.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00125 mg/kg	102	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5144434)							

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5144434) - continued							
EP2308516-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	122	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	108	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	103	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	102	60.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	111	60.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	122	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	95.7	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5144434)							
EP2308516-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	110	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	108	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	107	60.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2308619**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023
Site	: HEHB SD - JS	Issue Date	: 05-Jul-2023
Sampler	: [redacted]	No. of samples received	: 9
Order number	: pfas-omp HEHB	No. of samples analysed	: 9

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0082_SD164_230626, 0082_QC105_230626, 0082_SS165_230626, 0082_SS167_230626, 0082_SS171_230626, 0082_SS169_230626, 0082_SS173_230626, 0082_SS179_230626, 0082_SD181_230626	**26-Jun-2023**	**----**	----	----	**04-Jul-2023**	10-Jul-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0082_SD164_230626, 0082_QC105_230626, 0082_SS165_230626, 0082_SS167_230626, 0082_SS171_230626, 0082_SS169_230626, 0082_SS173_230626, 0082_SS179_230626, 0082_SD181_230626	**26-Jun-2023**	**30-Jun-2023**	23-Dec-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0082_SD164_230626, 0082_QC105_230626, 0082_SS165_230626, 0082_SS167_230626, 0082_SS171_230626, 0082_SS169_230626, 0082_SS173_230626, 0082_SS179_230626, 0082_SD181_230626	**26-Jun-2023**	**30-Jun-2023**	23-Dec-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0082_SD164_230626, 0082_QC105_230626, 0082_SS165_230626, 0082_SS167_230626, 0082_SS171_230626, 0082_SS169_230626, 0082_SS173_230626, 0082_SS179_230626, 0082_SD181_230626	**26-Jun-2023**	**30-Jun-2023**	23-Dec-2023	✓	**04-Jul-2023**	09-Aug-2023	✓

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0082_SD164_230626, 0082_QC105_230626, 0082_SS165_230626, 0082_SS167_230626, 0082_SS171_230626, 0082_SS169_230626, 0082_SS173_230626, 0082_SS179_230626, 0082_SD181_230626	**26-Jun-2023**	**30-Jun-2023**	23-Dec-2023	✓	**04-Jul-2023**	09-Aug-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0082_SD164_230626, 0082_QC105_230626, 0082_SS165_230626, 0082_SS167_230626, 0082_SS171_230626, 0082_SS169_230626, 0082_SS173_230626, 0082_SS179_230626, 0082_SD181_230626	**26-Jun-2023**	**30-Jun-2023**	23-Dec-2023	✓	**04-Jul-2023**	09-Aug-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	*Method*	*Matrix*	*Method Descriptions*
QuECheRS Extraction of Solids	* ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2308619**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0082_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp HEHB	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53975	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: HEHB SD - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 28-Jun-2023 11:20	Issue Date	: 29-Jun-2023
Client Requested Due Date	: 07-Jul-2023	Scheduled Reporting Date	: **07-Jul-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 6.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 9 / 9

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EP2308619-001	26-Jun-2023 12:28	0082_SD164_230626	✓	✓
EP2308619-002	26-Jun-2023 12:29	0082_QC105_230626	✓	✓
EP2308619-003	26-Jun-2023 12:53	0082_SS165_230626	✓	✓
EP2308619-004	26-Jun-2023 13:22	0082_SS167_230626	✓	✓
EP2308619-005	26-Jun-2023 13:28	0082_SS171_230626	✓	✓
EP2308619-006	26-Jun-2023 13:29	0082_SS169_230626	✓	✓
EP2308619-007	26-Jun-2023 14:42	0082_SS173_230626	✓	✓
EP2308619-008	26-Jun-2023 14:43	0082_SS179_230626	✓	✓
EP2308619-009	26-Jun-2023 15:18	0082_SD181_230626	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted] [redacted]

- A4 - AU Tax Invoice (INV)	Email	[redacted]cardno.com.au
DERP LAB REPORTS		
- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au
[redacted] [redacted]		
- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]stantec.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	[redacted]stantec.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	[redacted]stantec.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	[redacted]stantec.com
- Chain of Custody (CoC) (COC)	Email	[redacted]stantec.com
- EDI Format - ESDAT (ESDAT)	Email	[redacted]stantec.com
- EDI Format - XTab (XTAB)	Email	[redacted]stantec.com

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2308619

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0042-PFASOMP_23 **Client:** STANTEC **Project Manager:** Maelle BOURDAIS

53956 53979 53975 53984 53955 53957

ALS Compass COC Reference: 53958 **# Samples:** 53977 53976 [illegible] **Phone:** (0448 308 372)

Sampler: JS CG MB

Phone: ( )

Turnaround Requirements: Standard _____ Urgent _____

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by:	Relinquished by:	Received by:
Date / Time: 27/06/23	Date / Time: 28/6 1120	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 53975 *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0083_PFASOMP_23

SITE: HEHA SD - JS

ORDER NO: pfas-omp HEHA

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Sediments SEDIMENT	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0082_SD164		26/06/2023 12:28 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
002	0082_QC105		26/06/2023 12:29 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
003	0082_SS165		26/06/2023 12:53 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
004	0082_SS167		26/06/2023 01:22 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
005	0082_SS171		26/06/2023 01:28 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
006	0082_SS169		26/06/2023 01:29 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
007	0082_SS173		26/06/2023 02:42 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
008	0082_SS179		26/06/2023 02:43 PM	SOIL	ALS: 1 Non ALS: 0	No	X		
009	0082_SD181		26/06/2023 03:18 PM	SOIL	ALS: 1 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 53975 ALS Laboratory: EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0083_PFASOMP_23

SITE: HEHA SD - JS

ORDER NO: pfas-omp HEHA

PROJECT MANAGER [redacted]

PRIMARY SAMPLER

EMAIL REPORTS TO

EMAIL INVOICES TO

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0082_SD164	HDPE Soil Jar	200 mL	00620322054887	Grey	No	
002	0082_QC105	HDPE Soil Jar	200 mL	00620322054871	Grey	No	
003	0082_SS165	HDPE Soil Jar	200 mL	00620322054971	Grey	No	
004	0082_SS167	HDPE Soil Jar	200 mL	00620322054895	Grey	No	
005	0082_SS171	HDPE Soil Jar	200 mL	00620322054989	Grey	No	
006	0082_SS169	HDPE Soil Jar	200 mL	00620322054953	Grey	No	
007	0082_SS173	HDPE Soil Jar	200 mL	00620322054910	Grey	No	
008	0082_SS179	HDPE Soil Jar	200 mL	00620322054951	Grey	No	
009	0082_SD181	HDPE Soil Jar	200 mL	00620322054935	Grey	No	

Total Bottle Count: ALS: 9, Non ALS: 0

CERTIFICATE OF ANALYSIS

Work Order	: **EP2308620**	Page	: 1 of 6
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023 11:20
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 30-Jun-2023
C-O-C number	: 53984	Issue Date	: 07-Jul-2023 12:04
Sampler	: [redacted]		
Site	: HEHB SW/OTH - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Thomas Donovan	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

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

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

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

- EP231X - Per- and Polyfluoroalkyl Substances (PFAS): Samples received in 20ml or 125ml bottles have been tested in accordance with the QSM5.3 compliant, NATA accredited method. 60mL or 250mL bottles have been tested to the legacy QSM 5.1 aligned, NATA accredited method.
- As per QWI – EN55-3 Data Interpreting Procedures, Ionic balances are typically calculated using Major Anions - Chloride, Alkalinity and Sulfate; and Major Cations - Calcium, Magnesium, Potassium and Sodium. Where applicable and dependent upon sample matrix, the Ionic Balance may also include the additional contribution of Ammonia, Dissolved Metals by ICPMS and H+ to the Cations and Nitrate, SiO2 and Fluoride to the Anions.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0082_SW181_230626	0082_QC107_230626	----	----	----
				Sampling date / time	26-Jun-2023 15:14	26-Jun-2023 15:16	----	----	----
Compound	CAS Number	LOR	Unit		EP2308620-001	EP2308620-002	--------	--------	--------
					Result	Result	----	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	----	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	----	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		**173**	**173**	----	----	----
Total Alkalinity as CaCO3	----	1	mg/L		**173**	**173**	----	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		**2440**	**2760**	----	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**17800**	**17700**	----	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		**492**	**486**	----	----	----
Magnesium	7439-95-4	1	mg/L		**1570**	**1500**	----	----	----
Sodium	7440-23-5	1	mg/L		**11700**	**11600**	----	----	----
Potassium	7440-09-7	1	mg/L		**624**	**614**	----	----	----
EN055: Ionic Balance									
ø **Total Anions**	----	0.01	meq/L		**556**	**560**	----	----	----
ø **Total Cations**	----	0.01	meq/L		**679**	**668**	----	----	----
ø **Ionic Balance**	----	0.01	%		**9.90**	**8.77**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0082_SW181_230626	0082_QC107_230626	----	----	----
				Sampling date / time	26-Jun-2023 15:14	26-Jun-2023 15:16	----	----	----
Compound	CAS Number	LOR	Unit		EP2308620-001	EP2308620-002	--------	--------	--------
					Result	Result	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.05	<0.05	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.05	<0.05	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.02	<0.02	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.02	<0.02	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	<0.05	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		<0.05	<0.05	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0082_SW181_230626	0082_QC107_230626	----	----	----
				Sampling date / time	26-Jun-2023 15:14	26-Jun-2023 15:16	----	----	----
Compound	CAS Number	LOR	Unit		EP2308620-001	EP2308620-002	--------	--------	--------
					Result	Result	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	<0.05	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**105**	----	----	----
13C8-PFOA	----	0.02	%		**96.8**	**99.4**	----	----	----

Surrogate Control Limits

Sub-Matrix: SURFACE WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

QUALITY CONTROL REPORT

Work Order	: **EP2308620**	Page	: 1 of 7
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: ----	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023
Order number	: pfas-omp HEHB	Date Analysis Commenced	: 30-Jun-2023
C-O-C number	: 53984	Issue Date	: 07-Jul-2023
Sampler	: [redacted]		
Site	: HEHB SW/OTH - JS		
Quote number	: SY/139/19 B		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Thomas Donovan	Senior Organic Chemist	Perth Organics, Wangara, WA

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 5144556)									
EP2308652-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.0	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	82	82	0.0	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	82	82	0.0	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 5148879)									
EP2308620-001	0082_SW181_230626	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2440	2470	1.1	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 5148880)									
EP2308840-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1460	1460	0.2	0% - 20%
EP2308620-001	0082_SW181_230626	ED045G: Chloride	16887-00-6	1	mg/L	17800	17800	0.1	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 5140830)									
EP2308610-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	472	471	0.2	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	1490	1490	0.0	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	11700	11600	0.1	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	610	609	0.2	0% - 20%
EP2308618-009	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	7	7	0.0	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	7	6	0.0	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	209	209	0.0	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	33	33	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5145707)									
EP2308660-062	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5145707) - continued									
EP2308660-062	Anonymous	EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5145707)									
EP2308660-062	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5145707)									
EP2308660-062	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5145707)									
EP2308660-062	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5145707)									
EP2308660-062	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 5145707) - continued									
EP2308660-062	Anonymous	EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED037P: Alkalinity by PC Titrator (QCLot: 5144556)								
ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	----	----	----
ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	----	----	----	----
ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	<1	----	----	----	----
ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	<1	20 mg/L	94.6	87.8	118
				<1	200 mg/L	101	87.8	118
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5148879)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	100	89.9	112
				<1	500 mg/L	93.9	89.9	112
ED045G: Chloride by Discrete Analyser (QCLot: 5148880)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	99.6	88.6	113
				<1	1000 mg/L	97.4	88.6	113
ED093F: Dissolved Major Cations (QCLot: 5140830)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	98.3	86.5	117
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	96.1	88.4	110
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	95.2	91.4	113
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	93.3	84.6	108
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5145707)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	94.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	97.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	96.3	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	83.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	109	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	77.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145707)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	100	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	97.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	100	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	97.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.0	69.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5145707) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	89.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	99.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	81.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.25 µg/L	95.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5145707)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	101	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	104	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	98.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	107	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.9	62.2	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	117	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	91.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5145707)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	100	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	109	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	124	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	74.5	64.2	133
EP231P: PFAS Sums (QCLot: 5145707)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5148879)							
EP2308620-001	0082_SW181_230626						

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 5148879) - continued							
EP2308620-001	0082_SW181_230626	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	100 mg/L	# Not Determined	70.4	130
ED045G: Chloride by Discrete Analyser (QCLot: 5148880)							
EP2308620-001	0082_SW181_230626	ED045G: Chloride	16887-00-6	1000 mg/L	# Not Determined	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2308620**	Page	: 1 of 5
Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Telephone	: +61-8-9406 1301
Project	: WA_0082_PFASOMP_23	Date Samples Received	: 28-Jun-2023
Site	: HEHB SW/OTH - JS	Issue Date	: 07-Jul-2023
Sampler	: [redacted]	No. of samples received	: 2
Order number	: pfas-omp HEHB	No. of samples analysed	: 2

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EP2308620--001	0082_SW181_230626	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EP2308620--001	0082_SW181_230626	**Chloride**	16887-00-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
	0				
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	7	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
0082_SW181_230626, 0082_QC107_230626	**26-Jun-2023**	**----**	----	**----**	**30-Jun-2023**	10-Jul-2023	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
0082_SW181_230626	**26-Jun-2023**	**----**	----	**----**	**05-Jul-2023**	24-Jul-2023	✓
Clear Plastic Bottle - Natural (ED041G)							
0082_QC107_230626	**26-Jun-2023**	**----**	----	**----**	**06-Jul-2023**	24-Jul-2023	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
0082_SW181_230626, 0082_QC107_230626	**26-Jun-2023**	**----**	----	**----**	**06-Jul-2023**	24-Jul-2023	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
0082_SW181_230626, 0082_QC107_230626	**26-Jun-2023**	**----**	----	**----**	**03-Jul-2023**	03-Jul-2023	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0082_SW181_230626,	0082_QC107_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0082_SW181_230626,	0082_QC107_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0082_SW181_230626,	0082_QC107_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0082_SW181_230626,	0082_QC107_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0082_SW181_230626,	0082_QC107_230626	**26-Jun-2023**	**03-Jul-2023**	23-Dec-2023	✓	**04-Jul-2023**	23-Dec-2023	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Alkalinity by Auto Titrator	ED037-P	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by Auto Titrator	ED037-P	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	7	**28.57**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Alkalinity by Auto Titrator	ED037-P	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Chloride by Discrete Analyser	ED045G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	7	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Alkalinity by Auto Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) on a settled supernatant aliquot of the sample using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM Schedule B(3)
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G.The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm.
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	* EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	WATER	In-house: Analysis of fresh and saline waters by Solid Phase Extraction (SPE) followed by LC-Electrospray-MS-MS, Negative Mode using MRM and internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
Solid Phase Extraction (SPE) for PFAS in water	* ORG72	WATER	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to the sample container. The entire contents are transferred to a solid phase extraction (SPE) cartridge. The sample container is successively rinsed with aliquots of the elution solvent. The eluted extract is combined with an equal volume of reagent water and a portion is filtered for analysis. Method procedures conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2308620**

Client	: **STANTEC AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: [redacted]	Contact	: Customer Services EP
Address	: GROUND FLOOR 226 ADELAIDE TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: [redacted]stantec.com	E-mail	: ALSEnviro.Perth@alsglobal.com
Telephone	: ----	Telephone	: +61-8-9406 1301
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: WA_0082_PFASOMP_23	Page	: 1 of 2
Order number	: pfas-omp HEHB	Quote number	: ES2022MWHAUS0002 (SY/139/19 B)
C-O-C number	: 53984	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: HEHB SW/OTH - JS		
Sampler	: [redacted]		

Dates

Date Samples Received	: 28-Jun-2023 11:20	Issue Date	: 29-Jun-2023
Client Requested Due Date	: 07-Jul-2023	Scheduled Reporting Date	: **07-Jul-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 2	Temperature	: 6.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 2 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02 Ca, Mg, Na, K, Cl, SO4, Alkalinity
EP2308620-001	26-Jun-2023 15:14	0082_SW181_230626	✓	✓
EP2308620-002	26-Jun-2023 15:16	0082_QC107_230626	✓	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]
- A4 - AU Tax Invoice (INV) — Email — [redacted]cardno.com.au

DERP LAB REPORTS
- *AU Certificate of Analysis - NATA (COA) — Email — derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email — derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC) — Email — derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN) — Email — derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC) — Email — derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT) — Email — derp.labreports@esdat.com.au
- EDI Format - XTab (XTAB) — Email — derp.labreports@esdat.com.au

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

ALSCompass
SAMPLING *Intelligence*

ALS

Environmental Division
Perth
Work Order Reference
EP2308620

Telephone : +61-8-9406 1301

Custody Document for Submissions via ALS Compass App

Project: WA-0082-PFASONP_23 **Client:** STANTEC **Project Manager:** Maelle BOURDAIS

53956 53979 53975 (53984) 53955 53957

ALS Compass COC Reference: 53958 **# Samples:** 53977 53956 53979 **Phone:** (0448 308 372)

Sampler: JS CG JB

Phone: ( )

Turnaround Requirements: (Standard) _____ Urgent _____

Special Instructions:

Custody:

Relinquished by: STANTEC	Received by:	Relinquished by:	Received by:
Date / Time: 27/06/23	Date / Time: 28/6 1120	Date / Time:	Date / Time:

CHAIN OF CUSTODY

ALS COC#: 53984 ALS Laboratory: EP Perth

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

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0083_PFASOMP_23

SITE: HEHA SW/OTH - JS

ORDER NO: pfas-omp HEHA

PROJECT MANAGER [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	WA OMP Water Suite WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0082_SW181		26/06/2023 03:14 PM	WATER	ALS: 3 Non ALS: 0	No	X		
002	0082_QC107		26/06/2023 03:16 PM	WATER	ALS: 3 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) *COC#:* **53984** *ALS Laboratory:* EP Perth

CLIENT: MWHAUS - STANTEC AUSTRALIA PTY LTD

PROJECT: WA_0083_PFASOMP_23

SITE: HEHA SW/OTH - JS

ORDER NO: pfas-omp HEHA

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0082_SW181	HDPE (no PTFE)	20 mL	00350822000478	Grey	No	
001	0082_SW181	HDPE (no PTFE)	20 mL	00350822000421	Grey	No	
001	0082_SW181	Clear Plastic Bottle - Natural	125 mL	00071121129618	Green	No	
002	0082_QC107	Clear Plastic Bottle - Natural	125 mL	00071121129672	Green	No	
002	0082_QC107	HDPE (no PTFE)	20 mL	00350822000402	Grey	No	
002	0082_QC107	HDPE (no PTFE)	20 mL	00350822000523	Grey	No	

Total Bottle Count: ALS: 6, Non ALS: 0

APPENDIX

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FIELD RECORDS & CALIBRATION CERTIFICATES

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Monitoring Date	Monitoring Location	Sample_ID	Screen Interval	Screen Level	TOC (mAHD)	SWL (mbTOC)	RWL (mAHD)	Observations	Purge Method	Temp (Co)	DO (mg/L)	EC (us/Cm)	TDS	pH	Eh (mV)	Temp (Co)2	DO (mg/L)2	EC (us/Cm)2	TDS2	pH2	Eh (mV)2
26/06/2023	MW022	0082_MW022_230626	4-7_	Single_Level	6.675	6.23	0.445		HydraSleeve	27.3	3.51	785	511	7.34	-42.2						
26/06/2023	MW103D	0082_MW103D_230626	11-15_	Single_Level	9.3778	8.84	0.538		HydraSleeve	27.2	2.64	4780	3109	7.36	-70.1						
26/06/2023	MW105S	0082_MW105S_230626	2-4_	Single_Level	3.8438	3.465	0.379	Not enough water to fill hydrasleeve	HandBailing	28.4	0.86	2662	1729	7.42	-0.8						
26/06/2023	MW108	0082_MW108_230626	1.7-6.7_	Single_Level	4.4433	4.03	0.413		HydraSleeve	26.5	1.44	11527	7559.5	7.36	18.4						
26/06/2023	MW113	0082_MW113_230626	4.5-9.5_	Single_Level	6.6842	6.14	0.544		HydraSleeve	26.9	1.64	2905	1888	7.64	-45.3						
26/06/2023	MW115	0082_MW115_230626	5.3-10.3_	Single_Level	7.7258	7.1	0.626	Well partially blocked by roots. Not enough volume for field parameters or cations/anions.	HydraSleeve												
26/06/2023	MW118D	0082_MW118D_230626	7.5-11.5_	Single_Level	6.2622	5.8	0.462		HydraSleeve	27.9	2.91	4257	2770	7.68	-59.9						
26/06/2023	MW122	0082_MW122_230626	3.5-8.5_	Single_Level	5.0782	4.685	0.393		HydraSleeve	28.1	2.57	8495	5538	7.5	27.7						
26/06/2023	MW126	0082_MW126_230626	4.5-8.5_	Single_Level	4.8325	4.47	0.362		HydraSleeve	26.1	1.93	1936	1254.5	7.75	12.9						
26/06/2023	MW128	0082_MW128_3.7-4.2_230626	3.7-4.2_	Multi_level	2.5435	2.37	0.173		Peristaltic Pump	25.5	2.95	56670	36855	7.51	38.6	25.1	2.99	56717	36855	7.52	38.3
26/06/2023	MW129	0082_MW129_3.5-4_230626	3.5-4_	Multi_level	2.5311	2.413	0.118		Peristaltic Pump	28.2	2.97	55369	36123	7.5	0.1						
26/06/2023	MW130	0082_MW130_4.9-5.4_230626	4.9-5.4_	Multi_level	2.4364	2.361	0.075		Peristaltic Pump	27.2	2.02	51628	33555	7.5	1						
26/06/2023	MW131	0082_MW131_4-4.5_230626	4-4.5_	Multi_level	-	2.5	-	No vehicle access	Peristaltic Pump	26.4	3.59	5421	3516.5	7.42	21.6	26.2	3.53	5397	3510	7.41	22.4
26/06/2023	MW132	0082_MW132_6.4-6.9_230626	6.4-6.9_	Multi_level	5.4349	5.213	0.222		Peristaltic Pump	27	0.73	46018	29918	7.24	-138.6						
26/06/2023	MW133	0082_MW133_3-3.5_230626	3-3.5_	Multi_level	2.1505	1.94	0.211		Peristaltic Pump	24.5	3.35	46563	30280	7.36	-77.2	24.3	3.32	46555	30276	7.34	-75.2
26/06/2023	MW134	0082_MW134_6.6-7.1_230626	6.6-7.1_	Multi_level	6.5343	5.888	0.646		Peristaltic Pump	26.9	1.22	42969	27936	6.92	-6.5						
26/06/2023	MW135	0082_MW135_10.3-10.8_230626	10.3-10.8_	Multi_level	9.301	5.854	3.447		Peristaltic Pump	28.6	1.83	21770	14154	7.22	-1.1						
26/06/2023	MW137	0082_MW137_6.1-6.6_230626	6.1-6.6_	Multi_level	5.3984	5.01	0.388		Peristaltic Pump	28	2.99	13525	8792	7.38	-61	27.9	2.95	13521	8782	7.36	-60.8
26/06/2023	MW142	0082_MW142_230626	4.5-10.5_	Single_Level	7.5281	6.94	0.588		HydraSleeve	25.8	2.03	5209	3386	7.02	-34.3						
26/06/2023	MW143	0082_MW143_230626	7-13_	Single_Level	10.5204	9.95	0.57		HydraSleeve	26.8	5.19	993	646	7.9	-50						
26/06/2023	MW144S	0082_MW144S_230626	2-8_	Single_Level	6.0715	5.71	0.362		HydraSleeve	27.2	1.4	2215	1443	7.75	-17						
26/06/2023	MW145	0082_MW145_230626	0.9-6.9_	Single_Level	3.8644	3.685	0.179		HydraSleeve	27.1	1.16	49817	32435	6.99	36.4						
26/06/2023	MW147	0082_MW147_230626	4.5-8.5_	Single_Level	5.51	5.225	0.285		HydraSleeve	27.9	1.52	35366	22975	6.94	-6.8						
26/06/2023	MW148S	0082_MW148S_230626	3-9_	Single_Level	5.7648	5.179	0.586		HydraSleeve	28	1.83	42922	27907	7.02	6.1						
26/06/2023	MW151S	0082_MW151S_230626	1-5_	Single_Level	3.4	3.319	0.081		HydraSleeve	26.3	1.95	55378	35994	7.12	7.2						
26/06/2023	MW152S	0082_MW152S_230626	2.5-6.5_	Single_Level	3.4103	3.215	0.195		HydraSleeve	27.1	6.23	25961	16856	7.21	3.7						
26/06/2023	MW153S	0082_MW153S_230626	2-6_	Single_Level	4.7872	4.565	0.222		HydraSleeve	28.3	0.84	46370	30174	6.96	13.4						
26/06/2023	MW154S	0082_MW154S_230626	2-6_	Single_Level	3.8177	3.39	0.428		HydraSleeve	28.6	1.2	27551	17920	6.76	-39.7						
26/06/2023	MW155S	0082_MW155S_230626	2.5-8.5_	Single_Level	5.0072	3.95	1.057		HydraSleeve	27.6	0.93	22409	14567	6.79	-75.6						
26/06/2023	MW310	0082_MW310_230626	3.5-6.5_	Single_Level	5.401	4.91	0.491		HydraSleeve	26.9	3.2	3654	2372	7.44	-40.5						
26/06/2023	MW311	0082_MW311_230626	2.5-5.5_	Single_Level	4.205	3.73	0.475		HydraSleeve	27.6	3.16	507	329.8	7.91	-35.7						
26/06/2023	MW315	0082_MW315_230626	6.5-9.5_	Single_Level	8.018	7.47	0.548		HydraSleeve	27.7	3.74	1600	1041	7.99	-69.9						
26/06/2023	MW326	0082_MW326_230626	NA	Single_Level	2.611	2.37	0.241		HydraSleeve	27	1.42	38737	25161.5	7.28	21.5						

Temp (Co)3	DO (mg/L)3	EC (us/Cm)3	TDS3	pH3	Eh (mV)3	QC Dup Sample #	Odour Comments	Colour
								Brown
								Clear
								Brown
								Cloudy
								Clear
								Brown
								Clear
								Cloudy
								Cloudy
25.1	2.96	56751	36920	7.52	38.3			Brown
								Clear
								Clear
26.1	3.6	5386	3497	7.41	23			Clear
								Clear
24.2	3.32	46551	30272	7.32	-74.3			Clear
								Clear
								Clear
27.8	2.94	13515	8776	7.35	-60.5			Cloudy
						QC103/203		Clear
								Clear
								Cloudy
								Cloudy
						QC101/201		Clear
								Clear
								Clear
								Clear
								Clear
							Hydrogen sulfide	Brown
								Cloudy
								Brown
								Cloudy
						QC104/204		Brown
						102/202		Cloudy

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D2 - Seepage Water Field Records

Monitoring Date	Monitoring Location	Sample_ID	Temp (Co)	DO (mg/L)	EC (us/Cm)	TDS	pH	Eh (mV)	QC Dup Sample #	Odour Comments	Colour
26/06/2023	OTH101	0082_OTH101_230626	21.6	3.46	55453	36075	8.13	27.8			Clear
26/06/2023	OTH102	0082_OTH102_230626	16.2	8.36	57241	37043	7.78	-1.2			
26/06/2023	OTH103	0082_OTH103_230626	16.4	7.61	56827	36926	7.93	-2.4			
26/06/2023	OTH104	0082_OTH104_230626	20.3	3.85	54785	35613.5	8.13	37.3			Cloudy
26/06/2023	OTH105	0082_OTH105_230626	16.6	7.44	57485	37355	7.92	0.2			
26/06/2023	OTH106	0082_OTH106_230626	20.6	3.98	54792	35620	8.15	34.1			Cloudy

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D3 - Surface Water Field Records

Date	Monitoring Site ID	Sample ID	Temp (Co)	DO (mg/L)	EC (us/Cm)	TDS	pH	Eh (mV)	Sample Depth (m)	WaterBody Depth (m)	Flow Rate	SW Site Comments ?
26/06/2023	SW161											Dry
26/06/2023	SW162											Dry
26/06/2023	SW163											Dry
26/06/2023	SW164											Dry
26/06/2023	SW165											Dry
26/06/2023	SW167											Dry
26/06/2023	SW169											Dry
26/06/2023	SW171											Dry
26/06/2023	SW173											Dry
26/06/2023	SW179											Dry
26/06/2023	SW181	0082_SW181_230626	21.3	6.4	56781	36908	7.85	-76.9	0.1	0.5	Slow	

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D4 - Sediment Field Records

Monitoring Site ID	Date	Sample ID	Depth of Sediment Sampling (m)	Sampling Method	Sample Condition	Sample Description	Other SS Site Comments ?
SD161	26/06/2023	0082_SD161_230626	0.1	Trowel	Dry	Brown sandy clay	
SD162	26/06/2023	0082_SD162_230626	0.1	Trowel	Dry	Brown/black clay with sand	QC106/206
SD163	26/06/2023	0082_SD163_230626	0.1	Trowel	Dry	Do brown clay, sandy, salt crust	
SD164	26/06/2023	0082_SD164_230626	0.1	Direct into Bottle	Dry	Sand, fine to med grained, red brown, trace organics, trace gravels	QC105/205
SD181	26/06/2023	0082_SD181_230626	0.1	Direct into Bottle	Wet	Sand, fine to med grained, trace shells, beige	
SS165	26/06/2023	0082_SS165_230626	0.1	Direct into Bottle	Dry	Sand, fine grained, red brown, trace fines, trace gravels	
SS167	26/06/2023	0082_SS167_230626	0.1	Direct into Bottle	Dry	Sand, fine grained, red brown, trace fines	
SS169	26/06/2023	0082_SS169_230626	0.1	Direct into Bottle	Dry	Sand, fine to med grained, red brown, trace fines	
SS171	26/06/2023	0082_SS171_230626	0.1	Direct into Bottle	Dry	Sand, fine to med grained, red brown, trace fines, trace gravels	
SS173	26/06/2023	0082_SS173_230626	0.1	Direct into Bottle	Dry	Sand, fine grained, brown, trace gravels, trace shells	
SS179	26/06/2023	0082_SS179_230626	0.1	Direct into Bottle	Dry	Sand, fine grained, brown, trace fines, trace shells	

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 20K104050
Cable length: 1m 20K100096

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	173.30 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.42
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 2 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	Galvanic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (17F100079)	Check Temp NATA	Room Temp	19.4	-0.1	°C	NA	19.3	°C
pH (22F)	pH 7.00	392512	7.01	-9.50	mV	7.06	7.01	pH
pH (22F)	pH 4.00	394799	4.00	163.80	mV	4.03	4.00	pH
Conductivity (17F100079)	2764 µs/cm at 25°C	21/1012	2764	GLP	5.08	2784	2764	µs/cm
ORP (201005SIA605102)	Zobell A & B	23/2504	242	242	mV	209.7	239.4	mV
Zero DO (20H100139)	NaSO3 in distilled water	10175	0.0	NA	NA	0.4	0.0	%
100% DO (20H100139)	100% Air Saturation	Air	100.0	5.93	uA	108.4	100.0	%

Calibrated by: Gaurav Kanwar

Calibration Date: 16-Jun-23
Next Due: 13-Dec-23

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 22B104437
Cable length: 1m (22B100428)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	171.90 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.25
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 12 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (22B100315)	Check Temp NATA	Room Temp	17.1	0	°C	NA	17.1	°C
pH (22B)	pH 7.00	392512	7.01	-24.20	mV	7.05	7.01	pH
pH (22B)	pH 4.00	394799	4.00	147.70	mV	3.94	4.00	pH
Conductivity (22B100315)	2764 µs/cm at 25°C	21/1012	2764	GLP	5.09	2791	2764	µs/cm
ORP (22A)	Zobell A & B	23/2404	246	246	mV	236.5	234.6	mV
Zero DO (22B100173)	NaSO3 in distilled water	10175	0.0	NA	NA	0.6	0.0	%
100% DO (22B100173)	100% Air Saturation	Air	100.0	4.8	uA	103.7	100.0	%

Calibrated by: Gaurav Kanwar

Calibration Date: 21-Jun-23
Next Due: 18-Dec-23

GK Environmental EQUIPMENT

Calibration Report

Multi-Parameter Water Quality Instrument

Customer:
Contact:

Manufacturer: YSI
Instrument: Professional Plus with Quatro cable
Serial #: 22C103026
Cable length: 1m (22B100428)

Item	Test	Pass	Comments
Battery	2 x Alkaline C-cells	✓	Voltage reading above 2.9V
	Battery Saver	✓	Automatically turns off after 30 minutes if not used
Connections	Condition	✓	Good, clean
Cable	Condition	✓	Clean, no tears
Display	Operation	✓	
Firmware	Version	✓	4.0.0
Keypad	Operational	✓	
Display	Screen	✓	
Unit	Condition, seals and O-rings	✓	
Monitor housing	Condition	✓	
pH			
Condition		✓	Good, clean
pH millivolts for pH7 calibration range 0 mV ± 50 mV		✓	
pH 4 mV range + 165 to + 180 from 7 buffer mV value		✓	174.10 mV
pH slope		✓	55 to 60 mV/pH, ideal 59mV 58.87
Response time < 90 seconds		✓	
Calibrated and conforms to manufacturer's specifications		✓	
ORP			
Condition		✓	Good, clean
Response time < 90 seconds		✓	
within ± 80mv of reference Zobell Reading		✓	
Calibrated and conforms to manufacturer's specifications		✓	variance range ± 20mV 11 mV
Conductivity			
Condition		✓	Good, clean
Temperature		✓	°C
Conductivity cell constant 5.0 ± 1.0 in GLP file		✓	
Clean sensor reads less than 3 uS/cm in dry air		✓	
Calibrated and conforms to manufacturer's specifications		✓	µs/cm
Dissolved Oxygen			
Condition		✓	Good, clean
DO sensor in use		✓	polarographic
1.25 mil PE membrane (yellow membrane):		✓	
DO Sensor Value		✓	(min 4.31 uA - max 8.00 uA) Avg 6.15 uA
Calibrated and conforms to manufacturer's specifications		✓	ppm

This is to certify that the above instrument has been calibrated to the following specifications:

						Instrument Readings		
Parameter	**Standards**	**Reference**	**Calibration Point**	**Span**	**Units**	**Before**	**After**	**Units**
Temperature (22B100315)	Check Temp NATA	Room Temp	17.6	0	°C	NA	17.6	°C
pH (22D)	pH 7.00	392512	7.01	-15.00	mV	7.06	7.01	pH
pH (22D)	pH 4.00	394799	4.00	159.10	mV	3.98	4.00	pH
Conductivity (22B100315)	2764 µs/cm at 25°C	21/1012	2764	GLP	4.99	2773	2764	µs/cm
ORP (22B)	Zobell A & B	23/2504	245	245	mV	200.9	233.9	mV
Zero DO (22E100254)	NaSO3 in distilled water	10175	0.0	NA	NA	-0.3	0.0	%
100% DO (22E100254)	100% Air Saturation	Air	100.0	4.1	uA	87.3	100.0	%

Calibrated by: Gaurav Kanwar

Calibration Date: 15-Jun-23
Next Due: 12-Dec-23

Date of Bump Test	Site ID	Unit Brand/ Model	Ambient Air Oxygen Calibration	Zero % Oxygen Solution Calibration	Standard Concentrations	Ambient Temperature (°C)	Bump Test Reading	Bump Test Readings within ±5%?	Comment	Test by (Name)	(Signature)
26/6/23	0083-	YSI #22E103026	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: 2,764µS/cm (Y) / N	20.1	pH 4.00: 4.16. pH 7.00: 7.04 EC: 2,843.	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) / N	N.1	Jacob STUPPACK	O. STUPPACK
26/6/23	0083-	YSI #22F104114	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 (Y) / N EC: 2,764µS/cm Y / N	20.2	pH 4.00: 4.10 pH 7.00: 7.06 EC: 2,604	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) / N	N.1	Jacob STUPPACK	O STUPPACK
26/6/23	0083-	YSI #22B104457	100% Saturation? (Y) N	0% Calibration? (Y) N NA	pH 4.00 (Y) / N pH 7.00 Y / N EC: 2,764µS/cm Y / N	17.6	pH 4.00: 4.16 pH 7.00: 7.03. EC: 2,795	pH 4.00: (± pH 0.2) (Y) / N pH 7.00: (± pH 0.2) (Y) / N EC: (± 150µS/cm) (Y) / N	N.1	Jacob STUPPACK	O-STUPPACK
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 2,764µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 2,764µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 2,764µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 2,764µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			
		YSI #	100% Saturation? Y N	0% Calibration? Y N NA	pH 4.00 Y / N pH 7.00 Y / N EC: 2,764µS/cm Y / N		pH 4.00: pH 7.00: Temp: EC:	pH 4.00: (± pH 0.2) Y / N pH 7.00: (± pH 0.2) Y / N EC: (± 150µS/cm) Y / N			

APPENDIX

E

DATA QUALITY REVIEW

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Data Quality Review
PFAS Ongoing Monitoring Plan
June 2023 Monitoring Event

This appendix reviews the Quality Assurance (QA) and Quality Control (QC) documentation. Quality assurance encompasses the actions, procedures, checks and decisions undertaken to ensure sample integrity and representativeness, and the reliability and accuracy of analysis results. The QA documentation should also include an indication of the Data Quality Objectives sought in relation to each significant action, test or process involved in the assessment.

QC activities measure the effectiveness of the QA procedures by undertaking testing, and then comparing results to previously established objectives. QC work will include the internal laboratory testing as well as results of QC samples submitted such as trip blanks and duplicates. The quality of the information and/or data is deemed satisfactory when the QC results demonstrate that agreed objectives have been met.

QA/QC Aspects	Evidence & Evaluation
	QA Documentation
Project Quality Plan/Work Plan and Data Quality Objectives	The field investigation was carried out on 26th June 2023 and is generally in accordance with the proposed scope of work, as documented in the SAQP (PFAS OMP SAQP HEH-B, Cardno, June 2023) issued to the client and in general compliance with Standards Australia 1998. AS/NZ 5667:1998 *Water quality – sampling,* NEPM "*National Environment Protection (Assessment of Site Contamination) Measure"* and PFAS NEMP 2.0. A quality control program was implemented during the Investigation and the quality assurance procedures used have been reiterated in the report (PFAS OMP June 2023 Factual Report). In addition, a safety, health and environment work method statement (SHEWMS) were also prepared. The Data Quality Objectives were expressed in terms of the purpose of the assessment and the relevant assessment criteria.
	Data Representativeness
Use of Composites	No Composites were used during the investigation
Holding Times	Chain of custody and laboratory reports provide evidence of holding times. Holding times were generally in compliance with required timeframes. The following holding time exceedance was reported: ▪ Dissolved Major Cations – 1day overdue: EP2308607, EP2308608 The holding time exceedances for a minority of results are due to the remoteness of the site and the timing of the freight services. They are not considered to have adversely impacted the reliability of the results obtained, or the conclusions drawn from this assessment. Cardno ensures sample integrity by using overnight freight services where possible and keeping samples chilled with bagged ice.
Verification of field procedures	The methodology conducted during this investigation is documented in the body of the report and was in general conformance with the SAQP. Non-disposable equipment was decontaminated between sample locations.
Laboratory Reports	The following laboratory reports were considered for this data quality review: ▪ ALS reports: EP2308607, EP2308608, EP2308609, EP2308610, EP2308618, EP2308619, EP2308620 ▪ Eurofins ARL report: 1004374

<table>
<tr><th>QA/QC Aspects</th><th>Evidence & Evaluation</th></tr>
<tr><td colspan="2">Data Precision & Accuracy</td></tr>
<tr><td>QC sample Frequency</td><td>
<table>
<tr><th>QC sample type</th><th>SAQP required frequency</th><th>Sample Collected</th></tr>
<tr><td>Blind duplicate</td><td>1 in 10 primary samples (10%)</td><td>4 for 39 groundwater samples (10.3%)
1 in 1 surface water sample (100%)
2 in 11 sediment samples (18.2%)</td></tr>
<tr><td>Interlab duplicate</td><td>1 in 10 primary samples (10%)</td><td>4 for 40 groundwater samples (10.3%)
1 in 1 surface water sample (100%)
2 in 11 sediment samples (18.2%)</td></tr>
<tr><td>Rinsate</td><td>1 per field personnel per day</td><td>3 in 1 day (3 field personnel) (100%)</td></tr>
<tr><td>Field Blank</td><td>1 per field personnel per day</td><td>3 in 1 day (3 field personnel) (100%)</td></tr>
</table>
The required QC frequency was achieved for all media sampled.</td></tr>
<tr><td>RPD Acceptance criteria</td><td>
<table>
<tr><th>Magnitude of Results</th><th>Acceptable RPD range</th></tr>
<tr><td>< 10 x LOR</td><td>No limits</td></tr>
<tr><td>10 – 20 LOR</td><td>0% - 50%</td></tr>
<tr><td>> 20 x LOR</td><td>0% - 20%</td></tr>
</table></td></tr>
<tr><td>QC Testing – Blind Duplicates (Primary Lab)</td><td>Surface water
All RPDs were within acceptance criteria.
Sediment
All RPDs were within acceptance criteria.
Groundwater
RPD exceedances were reported for the following:
- PFOS: RPD of 28% between MW142 and duplicate sample QC103
- PFHxS+PFOS: RPD of 26% between MW142 and duplicate sample QC103
These minor RPD exceedances are likely due the low concentrations of analytes under review. This is not considered to have impacted the validity of the interpretation drawn upon this dataset.</td></tr>
<tr><td>QC Testing – Interlab Duplicates (Secondary Lab)</td><td>Surface water
All RPDs were within acceptance criteria.
Sediment
All RPDs were within acceptance criteria.
Groundwater
All RPDs were within acceptance criteria with the following exceptions:
- PFOS: RPD of 40% between MW142 and triplicate sample QC203
- PFHxS: RPD of 29% between MW142 and the triplicate sample QC203
These minor RPD exceedances are likely due the difference of methodologies between the primary and secondary laboratories and the low concentrations of analytes under review. This is not considered to have impacted the validity of the interpretation drawn upon this dataset.</td></tr>
<tr><td>Field Blanks</td><td>Field Blanks were collected at a rate of one per fieldwork team per day. All field blank samples tested reported analytes below the laboratory limit of reporting.</td></tr>
</table>

QA/QC Aspects	Evidence & Evaluation
Laboratory Internal QC	Evidence of the laboratories internal QC testing is present and complete in the reports. ALS (Primary) performed internal QC with adequate testing and satisfactory results for method blank, laboratory control samples and laboratory duplicates. All Matrix Spikes generally reported recoveries within the acceptance range of 70% to 130% except for the following: ▪ EP2308607: - Sample ID: 0082_MW108_230626: Sulfate matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2308608: - Sample ID: 0082_MW129_3.5-4.0_230626: Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. - Sample ID: Anonymous: Sulfate matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2308610: - Sample ID: Anonymous: Sulfate and chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. ▪ EP2308618: - Sample ID: Anonymous: Sulfate and chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. The following quality control samples frequency outliers were reported: ▪ EP2215715: - Laboratory Duplicates: PFAS by LCMSMS, expected frequency of 10% not achieved. ▪ EP2308620: - Sample ID: 0082_ W181_230626: Sulfate and Chloride matrix spike recovery not determined due to the background concentrations exceeding 4x spike level. The above outliers/exceptions are not considered to affect the reliability of the dataset. Outliers for frequency of quality control samples were identified for the following: - Lab duplicates for PFAS in lab report EP2308607 were undertaken at a rate of 8.89%, below the expected rate of 10%. - Lab duplicates for PFAS in lab report EP2308608 were undertaken at a rate of 7.69%, below the expected rate of 10%. - Lab duplicates and matrix spikes for PFAS in lab report EP2308610 were undertaken at a rate of 7.69% and 3.85%, below the expected rate of 10% and 5% respectively. - Lab duplicates and matrix spikes for PFAS in lab report EP2308618 were undertaken at a rate of 7.41% and 3.70%, below the expected rate of 10% and 5% respectively. The frequency of lab duplicate and matrix spike analyses were only slightly lower than the DQOs and are not expected to impact the reliability of the dataset.
Laboratory Method Detection Limit	Laboratory reports indicate the method detection limits were generally lower than the respective assessment criteria.
NATA endorsement of laboratory reports	Laboratory reports were stamped with the NATA endorsement stamp and signature. ALS Accreditation No. 825 Eurofins ARL Accreditation No. 1261
Calibration of Field Equipment	All equipment used during the investigation was calibrated by the supplier prior to use and daily readings of reference solutions (bump tests) were completed.

QA/QC Aspects	Evidence & Evaluation
	The equipment calibration certificates, and daily field bump test records are provided in Appendix D.
Decontamination and Equipment Blanks	Rinsate blanks were collected at a rate of one per day per sampler when reusable equipment was used. All rinsate samples tested reported analytes concentrations below the laboratory LORs.
	Data Comparability
Standard Procedures	Fieldwork procedures are detailed in the SAQP and reports and are comparable for each phase of Investigation.
Qualified Personnel	Staff involved in managing and reviewing the project and those involved in fieldwork are experienced and qualified personnel.
Sample Integrity	Field Chain of Custody/Laboratory request forms can be found in Appendix C.
	Data Completeness
Completeness of test program	The scope of work undertaken was generally consistent with the SAQP.
Validity of Data Set	The data quality review indicates no significant systematic errors in the data collection process and therefore, the data set used as the basis for groundwater, surface water, seepage water and sediment investigation is considered valid and complete.

APPENDIX

D

DATA ASSESSMENT

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Location Code	Well	Date Time	Water Depth bTOC	Water Depth bgl	Elevation	Comments
MW022	-	11/27/2005	6.37	5.813	0.305	
MW022	-	3/1/2016	6.305	5.748	0.37	
MW022	-	2/21/2018	6.22	5.663	0.455	
MW022	-	6/9/2018	6.139	5.582	0.536	
MW022	-	11/27/2019 4:00	6.4	5.843	0.275	
MW022	-	6/23/2020	6.23	5.673	0.445	
MW022	-	11/16/2020 4:00	7	7	-0.325	Bore locked
MW022	-	11/16/2020 4:00				Bore locked
MW022	-	6/22/2021 4:00	5.7	5.143	0.975	
MW022	-	1/18/2022 11:51	6.18	5.623	0.495	
MW022	-	6/20/2022	5.597	5.04	1.078	
MW022	-	11/21/2022 4:00	6.14	5.583	0.535	
MW022	-	1/19/2023 11:51	6.18	5.623	0.495	
MW022	-	3/27/2023 11:51	6.18	5.623	0.495	
MW022	-	6/26/2023	6.23	5.673	0.445	
MW103D	-	3/9/2018	8.83	8.36	0.548	
MW103D	-	6/9/2018	8.81	8.34	0.568	
MW103D	-	11/27/2019 4:00	8.99	8.52	0.388	
MW103D	-	6/23/2020	8.838	8.368	0.54	
MW103D	-	11/17/2020 4:00	8.948	8.478	0.43	
MW103D	-	11/17/2020 4:00	8.948	8.478	0.43	
MW103D	-	6/21/2021 4:00	8.445	7.975	0.933	
MW103D	-	1/18/2022 8:20	9.803	9.333	-0.425	
MW103D	-	6/20/2022	8.41	7.94	0.968	
MW103D	-	11/21/2022 4:00	8.77	8.3	0.608	
MW103D	-	1/19/2023 8:20	9.803	9.333	-0.425	
MW103D	-	3/27/2023 8:20	9.803	9.333	-0.425	
MW103D	-	6/26/2023	8.84	8.37	0.538	
MW105S	-	3/9/2018	3.451	2.978	0.393	
MW105S	-	6/4/2018	3.425	2.952	0.419	
MW105S	-	8/18/2019	3.614	3.141	-0.243	
MW105S	-	11/27/2019 4:00	3.62	3.147	0.224	
MW105S	-	6/23/2020	4	4	-0.156	
MW105S	-	11/17/2020 4:00	4	4	-0.156	Dry
MW105S	-	11/17/2020 4:00				Dry
MW105S	-	6/21/2021 4:00	2.92	2.447	0.924	
MW105S	-	1/18/2022 8:31	3.44	2.967	0.404	Not enough water to fill hydrasleeve
MW105S	-	6/20/2022	2.77	2.297	1.074	
MW105S	-	11/21/2022 4:00	4	4	-0.156	bore nearly dry
MW105S	-	1/19/2023 8:31	3.44	2.967	0.404	Not enough water to fill hydrasleeve
MW105S	-	3/27/2023 8:31	3.44	2.967	0.404	Not enough water to fill hydrasleeve
MW105S	-	6/26/2023	3.465	2.992	0.379	
MW108	-	3/7/2008	4.009	3.488	0.434	
MW108	-	6/18/2018	3.99	3.469	0.453	
MW108	-	11/21/2022 4:00	3.94	3.419	0.503	
MW108	-	6/26/2023	4.03	3.509	0.413	
MW113	-	3/10/2018	6.116	5.569	0.568	
MW113	-	6/9/2018	6.046	5.5	0.638	
MW113	-	11/27/2019 4:00	6.29	5.744	0.394	
MW113	-	6/23/2020	6.136	5.59	0.548	
MW113	-	11/17/2020 4:00	6.243	5.697	0.441	
MW113	-	11/17/2020 4:00	6.243	5.697	0.441	
MW113	-	6/21/2021 4:00	5.74	5.194	0.944	
MW113	-	1/18/2022 7:39	6.1	5.553	0.584	
MW113	-	6/20/2022	5.64	5.093	1.044	
MW113	-	11/21/2022 4:00	6.05	5.503	0.634	
MW113	-	1/19/2023 7:39	6.1	5.553	0.584	
MW113	-	3/27/2023 7:39	6.1	5.553	0.584	
MW113	-	6/26/2023	6.14	5.593	0.544	
MW115	-	3/8/2018	7.151	6.67	0.575	
MW115	-	6/9/2018	7.078	6.597	0.648	
MW115	-	11/27/2019 4:00	7.25	6.769	0.476	
MW115	-	6/23/2020	7.153	6.672	0.573	
MW115	-	11/17/2020 4:00	7.258	6.777	0.468	
MW115	-	11/17/2020 4:00	7.258	6.777	0.468	
MW115	-	6/21/2021 4:00	6.785	6.304	0.941	
MW115	-	1/18/2022 15:17	7.1	6.619	0.626	
MW115	-	6/20/2022	6.72	6.239	1.006	
MW115	-	11/21/2022 4:00	7.04	6.559	0.686	
MW115	-	1/19/2023 15:17	7.1	6.619	0.626	
MW115	-	3/27/2023 15:17	7.1	6.619	0.626	
MW115	-	6/26/2023	7.1	6.619	0.626	
MW118D	-	3/5/2018	5.837	5.329	0.425	
MW118D	-	6/9/2018	5.741	5.233	0.521	
MW118D	-	11/27/2019 4:00	5.3	4.792	0.962	
MW118D	-	6/23/2020	5.83	5.322	0.432	
MW118D	-	11/16/2020 4:00	5.124	4.616	1.138	
MW118D	-	11/16/2020 4:00	5.124	4.616	1.138	
MW118D	-	6/21/2021 4:00	5.21	4.702	1.052	

MW118D	-	1/18/2022 12:09	5.78	5.272	0.482	
MW118D	-	6/20/2022	5.185	4.677	1.077	
MW118D	-	11/21/2022 4:00	5.87	5.362	0.392	
MW118D	-	1/19/2023 12:09	5.78	5.272	0.482	
MW118D	-	3/27/2023 12:09	5.78	5.272	0.482	
MW118D	-	6/26/2023	5.8	5.292	0.462	
MW118D	-	9/13/2023 13:40	4.916	4.408	1.346	
MW122	-	3/5/2018	4.699	4.127	0.379	
MW122	-	6/16/2018	4.62	4.048	0.458	
MW122	-	8/20/2019	4.833	4.261	-0.327	
MW122	-	11/27/2019 4:00	8.5	8.5	-3.422	
MW122	-	6/23/2020	4.67	4.098	0.408	
MW122	-	10/12/2020 12:20	4.807	4.235	0.271	
MW122	-	11/16/2020 4:00	4.781	4.209	0.297	
MW122	-	11/16/2020 4:00	4.781	4.209	0.297	
MW122	-	6/22/2021 4:00	4.15	3.578	0.928	
MW122	-	1/18/2022 7:15	4.646	4.074	0.432	
MW122	-	6/20/2022	4.05	3.478	1.028	
MW122	-	11/21/2022 4:00	4.43	3.858	0.648	
MW122	-	1/19/2023 7:15	4.646	4.074	0.432	
MW122	-	3/27/2023 7:15	4.646	4.074	0.432	
MW122	-	6/26/2023	4.685	4.113	0.393	
MW122	-	9/13/2023 14:25	3.799	3.227	1.279	
MW126	-	3/5/2018	4.497	3.959	0.335	
MW126	-	6/16/2018	4.41	3.872	0.422	
MW126	-	11/27/2019 4:00	4.24	3.702	0.592	
MW126	-	6/23/2020	4.48	3.942	0.352	
MW126	-	11/17/2020 4:00	8.5	8.5	-3.668	Access restricted for Asbestos removal
MW126	-	11/17/2020 4:00				Access restricted for Asbestos removal
MW126	-	6/21/2021 4:00	3.845	3.307	0.987	
MW126	-	1/18/2022 17:48	2.054	1.516	2.778	
MW126	-	6/20/2022	3.75	3.212	1.082	
MW126	-	11/21/2022 4:00	8.5	8.5	-3.668	No field parameters recorded
MW126	-	1/19/2023 17:48	2.054	1.516	2.778	
MW126	-	3/27/2023 17:48	2.054	1.516	2.778	
MW126	-	6/26/2023	4.47	3.932	0.362	
MW126	-	9/13/2023 14:40	3.611	3.073	1.221	
MW128	7.7-8.2	3/5/2018	2.33	1.874	0.21	
MW128	1.7-2.2	3/5/2018	2.2	2.2	0.341	
MW128	3.7-4.2	3/5/2018	1.68	1.221	0.863	
MW128	5.7-6.2	3/5/2018	2.505	2.046	0.038	
MW128	7.7-8.2	6/15/2018	2.224	1.768	0.316	
MW128	1.7-2.2	6/15/2018	2.2	2.2	0.341	
MW128	3.7-4.2	6/15/2018	2.027	1.568	0.516	
MW128	5.7-6.2	6/15/2018	2.24	1.781	0.303	
MW128	3.7-4.2	11/27/2019 4:00	2.475	2.016	0.068	
MW128	3.7-4.2	6/23/2020	4.2	4.2	-1.657	
MW128	3.7-4.2	11/16/2020 4:00	2.51	2.051	0.034	
MW128	3.7-4.2	11/16/2020 4:00	2.51	2.051	0.034	
MW128	3.7-4.2	6/21/2021 4:00	2.13	1.671	0.414	
MW128	3.7-4.2	1/18/2022 8:38	2.34	1.881	0.204	
MW128	1.7-2.2	6/20/2022	1.66	1.204	0.881	
MW128	3.7-4.2	11/20/2022 4:00	2.357	1.898	0.186	
MW128	3.7-4.2	1/19/2023 8:38	2.34	1.881	0.204	
MW128	3.7-4.2	3/27/2023 8:38	2.34	1.881	0.204	
MW128	3.7-4.2	6/26/2023	2.37	1.911	0.173	
MW129	5.5-6.0	3/5/2018	2.235	1.749	0.301	
MW129	7.5-8.0	3/5/2018	2.236	1.753	0.297	
MW129	1.5-2.0	3/5/2018	2	2	0.541	
MW129	3.5-4.0	3/5/2018	2.236	1.755	0.295	
MW129	5.5-6.0	6/21/2018	2.01	1.524	0.526	
MW129	7.5-8.0	6/21/2018	2.028	1.545	0.505	
MW129	1.5-2.0	6/21/2018	2	2	0.541	
MW129	3.5-4.0	6/21/2018	2.019	1.538	0.512	
MW129	3.5-4.0	11/27/2019 4:00	2.32	1.839	0.211	
MW129	3.5-4.0	6/23/2020	2.235	1.754	0.296	
MW129	3.5-4.0	11/16/2020 4:00	2.34	1.859	0.191	
MW129	3.5-4.0	11/16/2020 4:00	2.34	1.859	0.191	
MW129	3.5-4.0	6/21/2021 4:00	1.855	1.374	0.676	
MW129	3.5-4.0	1/18/2022 14:24	2.188	1.707	0.343	
MW129	3.5-4.0	6/20/2022	1.74	1.259	0.791	
MW129	3.5-4.0	11/20/2022 4:00	2.33	1.849	0.201	
MW129	3.5-4.0	1/19/2023 14:24	2.188	1.707	0.343	
MW129	3.5-4.0	3/27/2023 14:24	2.188	1.707	0.343	
MW129	3.5-4.0	6/26/2023	2.413	1.932	0.118	
MW130	4.9-5.4	3/5/2018	2.136	1.638	0.3	
MW130	6.9-7.4	3/5/2018	1.518	0.989	0.948	
MW130	2.9-3.4	3/5/2018	2.976	2.526	-0.588	
MW130	4.9-5.4	6/20/2018	1.973	1.475	0.463	
MW130	6.9-7.4	6/20/2018	3.43	2.901	-0.964	
MW130	2.9-3.4	6/20/2018	1.901	1.451	0.487	

MW130	2.9-3.4	6/23/2020	2.08	1.63	0.308	
MW130	4.9-5.4	11/16/2020 4:00	3.355	2.857	-0.919	
MW130	4.9-5.4	11/16/2020 4:00	3.355	2.857	-0.919	
MW130	6.9-7.4	6/21/2021 4:00	1.695	1.166	0.771	
MW130	6.9-7.4	1/18/2022 15:06	2.118	1.589	0.349	
MW130	2.9-3.4	6/20/2022	1.43	0.98	0.958	
MW130	2.9-3.4	11/20/2022 4:00	2.3	1.85	0.088	
MW130	6.9-7.4	1/19/2023 15:06	2.118	1.589	0.349	
MW130	6.9-7.4	3/27/2023 15:06	2.118	1.589	0.349	
MW130	4.9-5.4	6/26/2023	2.361	1.863	0.075	
MW131	4.0-4.5	3/10/2018	2.592	1.992	0.285	
MW131	6.0-6.5	3/10/2018	2.597	1.984	0.293	
MW131	8.0-8.5	3/10/2018	2.593	1.995	0.282	
MW131	2.0-2.5	3/10/2018	2.575	1.973	0.305	
MW131	4.0-4.5	6/20/2018	2.409	1.809	0.468	
MW131	6.0-6.5	6/20/2018	2.415	1.802	0.475	
MW131	8.0-8.5	6/20/2018	2.405	1.807	0.47	
MW131	2.0-2.5	6/20/2018	2.369	1.767	0.511	
MW131	4.0-4.5	11/28/2019 4:00	2.6	2	0.277	
MW131	4.0-4.5	6/23/2020	2.575	1.975	0.302	
MW131	4.0-4.5	11/16/2020 4:00	2.69	2.09	0.187	
MW131	4.0-4.5	11/16/2020 4:00	2.69	2.09	0.187	
MW131	4.0-4.5	6/21/2021 4:00	2.06	1.46	0.817	
MW131	4.0-4.5	1/18/2022 15:59	2.825	2.225	0.052	
MW131	2.0-2.5	6/20/2022	1.95	1.348	0.93	
MW131	4.0-4.5	11/20/2022 4:00	2.56	1.96	0.317	
MW131	4.0-4.5	1/19/2023 15:59	2.825	2.225	0.052	
MW131	4.0-4.5	3/27/2023 15:59	2.825	2.225	0.052	
MW131	4.0-4.5	6/26/2023	2.5	1.9	0.377	
MW132	4.4-4.9	3/10/2018	4.838	4.322	0.572	
MW132	6.4-6.9	3/10/2018	5.158	4.617	0.277	
MW132	8.5-9.0	3/10/2018	5.115	4.571	0.323	
MW132	4.4-4.9	6/21/2018	5.04	4.524	0.37	
MW132	6.4-6.9	6/21/2018	5.037	4.496	0.398	
MW132	8.5-9.0	6/21/2018	5.06	4.516	0.378	
MW132	6.4-6.9	11/27/2019 4:00	5.24	4.699	0.195	
MW132	6.4-6.9	6/23/2020	5.095	4.554	0.34	Sludge at the bottom
MW132	4.4-4.9	11/16/2020 4:00	5.22	4.704	0.19	
MW132	4.4-4.9	11/16/2020 4:00	5.22	4.704	0.19	
MW132	8.5-9.0	6/21/2021 4:00	4.78	4.236	0.658	
MW132	6.4-6.9	1/18/2022 9:47	5.13	4.589	0.305	
MW132	6.4-6.9	6/20/2022	4.74	4.199	0.695	
MW132	6.4-6.9	11/21/2022 4:00	5.15	4.609	0.285	
MW132	6.4-6.9	1/19/2023 9:47	5.13	4.589	0.305	
MW132	6.4-6.9	3/27/2023 9:47	5.13	4.589	0.305	
MW132	6.4-6.9	6/26/2023	5.213	4.672	0.222	
MW132	6.4-6.9	9/13/2023 14:50	6.801	6.26	-1.366	
MW133	7.0-7.5	3/10/2018	1.941	1.41	0.223	
MW133	1.0-1.5	3/10/2018	1.5	1.5	0.655	
MW133	3.0-3.5	3/10/2018	1.932	1.414	0.219	
MW133	5.0-5.5	3/10/2018	2.043	1.512	0.121	
MW133	7.0-7.5	6/21/2018	1.708	1.177	0.456	
MW133	1.0-1.5	6/21/2018	1.5	1.5	0.655	
MW133	3.0-3.5	6/21/2018	1.694	1.176	0.457	
MW133	5.0-5.5	6/21/2018	1.707	1.176	0.457	
MW133	3.0-3.5	11/27/2019 4:00	2.1	1.582	0.05	
MW133	3.0-3.5	6/23/2020	1.915	1.397	0.236	
MW133	3.0-3.5	11/16/2020 4:00	2.05	1.532	0.101	
MW133	3.0-3.5	11/16/2020 4:00	2.05	1.532	0.101	
MW133	3.0-3.5	6/21/2021 4:00	2.06	1.542	0.091	
MW133	3.0-3.5	1/18/2022 10:27	1.9	1.382	0.251	
MW133	3.0-3.5	6/20/2022	1.2	0.682	0.951	
MW133	3.0-3.5	11/21/2022 4:00	1.9	1.382	0.251	
MW133	3.0-3.5	1/19/2023 10:27	1.9	1.382	0.251	
MW133	3.0-3.5	3/27/2023 10:27	1.9	1.382	0.251	
MW133	3.0-3.5	6/26/2023	1.94	1.422	0.211	
MW134	8.6-9.1	3/9/2018	6.214	5.676	0.317	
MW134	4.6-5.1	3/9/2018	5.573	5.023	0.97	
MW134	6.6-7.1	3/9/2018	6.215	5.674	0.319	
MW134	8.6-9.1	6/22/2018	6.18	5.642	0.351	
MW134	4.6-5.1	6/22/2018	5.1	5.1	1.443	
MW134	6.6-7.1	6/22/2018	6.173	5.632	0.361	
MW134	6.6-7.1	8/13/2019	6.382	5.841	0.161	
MW134	8.6-9.1	11/27/2019 4:00	9.1	9.1	-2.569	SWL not recorded
MW134	8.6-9.1	6/23/2020	6.23	5.692	0.301	
MW134	8.6-9.1	11/17/2020 4:00	6.345	5.807	0.186	
MW134	8.6-9.1	11/17/2020 4:00	6.345	5.807	0.186	
MW134	8.6-9.1	6/21/2021 4:00	5.95	5.412	0.581	
MW134	6.6-7.1	1/18/2022 16:57	5.995	5.454	0.539	
MW134	6.6-7.1	6/20/2022	5.7	5.159	0.834	
MW134	6.6-7.1	11/21/2022 4:00	6.15	5.609	0.384	

MW134	6.6-7.1	1/19/2023 16:57	5.995	5.454	0.539	
MW134	6.6-7.1	3/27/2023 16:57	5.995	5.454	0.539	
MW134	6.6-7.1	6/26/2023	5.888	5.347	0.646	
MW135	10.3-10.8	3/9/2018	8.868	8.298	0.433	
MW135	8.3-8.8	3/9/2018	8.841	8.273	0.458	
MW135	10.3-10.8	6/22/2018	8.791	8.221	0.51	
MW135	8.3-8.8	6/22/2018	8.766	8.198	0.533	
MW135	8.3-8.8	11/27/2019 4:00	8.8	8.8	0.499	Almost dry
MW135	8.3-8.8	6/25/2020	8.8	8.8	0.499	Bore damaged and blocked
MW135	8.3-8.8	11/17/2020 4:00	8.99	8.422	0.309	
MW135	8.3-8.8	11/17/2020 4:00	8.99	8.422	0.309	
MW135	10.3-10.8	6/21/2021 4:00	8.57	8	0.731	
MW135	8.3-8.8	1/18/2022 7:57	8.789	8.221	0.51	
MW135	10.3-10.8	6/20/2022	8.7	8.13	0.601	
MW135	10.3-10.8	11/21/2022 4:00	8.77	8.2	0.531	
MW135	8.3-8.8	1/19/2023 7:57	8.789	8.221	0.51	
MW135	8.3-8.8	3/27/2023 7:57	8.789	8.221	0.51	
MW135	10.3-10.8	6/26/2023	5.854	5.284	3.447	
MW137	8.1-8.6	3/9/2018	5.137	4.583	0.254	
MW137	10.1-10.6	3/9/2018	5.154	4.608	0.229	
MW137	4.1-4.6	3/9/2018	4.959	4.4	0.437	
MW137	6.1-6.6	3/9/2018	5.124	4.563	0.274	
MW137	8.1-8.6	6/22/2018	4.897	4.344	0.494	
MW137	10.1-10.6	6/22/2018	4.999	4.453	0.384	
MW137	4.1-4.6	6/22/2018	4.6	4.6	0.796	
MW137	6.1-6.6	6/22/2018	4.985	4.424	0.413	
MW137	6.1-6.6	11/27/2019 4:00	5.3	4.739	0.098	
MW137	6.1-6.6	6/23/2020	5.09	4.529	0.308	
MW137	6.1-6.6	11/16/2020 4:00	5.209	4.648	0.189	
MW137	6.1-6.6	11/16/2020 4:00	5.209	4.648	0.189	
MW137	8.1-8.6	6/21/2021 4:00	4.3	3.747	1.091	
MW137	6.1-6.6	1/18/2022 17:23	5.174	4.613	0.224	
MW137	4.1-4.6	6/20/2022	4.43	3.871	0.966	
MW137	6.1-6.6	11/21/2022 4:00	5.06	4.499	0.338	
MW137	6.1-6.6	1/19/2023 17:23	5.174	4.613	0.224	
MW137	6.1-6.6	3/27/2023 17:23	5.174	4.613	0.224	
MW137	6.1-6.6	6/26/2023	5.01	4.449	0.388	
MW142	-	6/22/2018	6.791	6.156	0.737	
MW142	-	11/27/2019 4:00	7.02	6.385	0.508	
MW142	-	6/23/2020	6.934	6.299	0.594	
MW142	-	11/17/2020 4:00	7.04	6.405	0.488	
MW142	-	11/17/2020 4:00	7.04	6.405	0.488	
MW142	-	6/21/2021 4:00	6.435	5.8	1.093	
MW142	-	1/18/2022 13:35	6.88	6.245	0.648	
MW142	-	6/20/2022	6.38	5.745	1.148	
MW142	-	11/21/2022 4:00	6.84	6.205	0.688	
MW142	-	1/19/2023 13:35	6.88	6.245	0.648	
MW142	-	3/27/2023 13:35	6.88	6.245	0.648	
MW142	-	6/26/2023	6.94	6.305	0.588	
MW143	-	6/23/2018	9.85	9.353	0.67	
MW143	-	11/27/2019 4:00	10.1	9.603	0.42	
MW143	-	6/23/2020	9.945	9.448	0.575	
MW143	-	11/17/2020 4:00	10.07	9.573	0.45	
MW143	-	11/17/2020 4:00	10.07	9.573	0.45	
MW143	-	6/21/2021 4:00	9.63	9.133	0.89	
MW143	-	1/18/2022 8:06	9.92	9.423	0.6	
MW143	-	6/20/2022	9.535	9.038	0.985	
MW143	-	11/21/2022 4:00	9.87	9.373	0.65	
MW143	-	1/19/2023 8:06	9.92	9.423	0.6	
MW143	-	3/27/2023 8:06	9.92	9.423	0.6	
MW143	-	6/26/2023	9.95	9.453	0.57	
MW144S	-	6/23/2018	5.515	4.89	0.557	
MW144S	-	11/28/2019 4:00	5.7	5.075	0.372	
MW144S	-	6/25/2020	5.686	5.061	0.386	
MW144S	-	11/17/2020 4:00	5.82	5.196	0.252	
MW144S	-	11/17/2020 4:00	5.82	5.196	0.252	
MW144S	-	6/21/2021 4:00	5.12	4.495	0.952	
MW144S	-	1/18/2022 14:14	5.675	5.05	0.397	
MW144S	-	6/20/2022	5.04	4.415	1.032	
MW144S	-	11/21/2022 4:00	5.65	5.026	0.422	
MW144S	-	1/19/2023 14:14	5.675	5.05	0.397	
MW144S	-	3/27/2023 14:14	5.675	5.05	0.397	
MW144S	-	6/26/2023	5.71	5.085	0.362	
MW145	-	6/20/2018	3.403	2.718	0.461	
MW145	-	11/27/2019 4:00	3.38	2.695	0.484	
MW145	-	6/25/2020	3.622	2.937	0.242	
MW145	-	11/17/2020 4:00	3.244	2.559	0.62	
MW145	-	11/17/2020 4:00	3.244	2.559	0.62	
MW145	-	6/21/2021 4:00	3.04	2.355	0.824	
MW145	-	1/18/2022 14:10	3.677	2.992	0.187	
MW145	-	6/20/2022	2.92	2.235	0.944	

MW145	-	11/21/2022 4:00	3.66	2.975	0.204	
MW145	-	1/19/2023 14:10	3.677	2.992	0.187	
MW145	-	3/27/2023 14:10	3.677	2.992	0.187	
MW145	-	6/26/2023	3.685	3	0.179	
MW147	-	6/21/2018	5.157	4.681	0.353	
MW147	-	11/27/2019 4:00	8.5	8.5	-2.99	
MW147	-	6/23/2020	8.5	8.5	-2.99	
MW147	-	11/17/2020 4:00	5.238	4.762	0.272	
MW147	-	11/17/2020 4:00	5.238	4.762	0.272	
MW147	-	6/22/2021 4:00	4.96	4.484	0.55	
MW147	-	1/18/2022 16:14	5.212	4.736	0.298	
MW147	-	6/20/2022	4.8	4.324	0.71	
MW147	-	11/21/2022 4:00	5.35	4.874	0.16	
MW147	-	1/19/2023 16:14	5.212	4.736	0.298	
MW147	-	3/27/2023 16:14	5.212	4.736	0.298	
MW147	-	6/26/2023	5.225	4.749	0.285	
MW148S	-	6/21/2018	5.411	4.905	0.354	
MW148S	-	8/13/2019	5.615	5.109	0.15	
MW148S	-	11/27/2019 4:00	6.7	6.194	-0.935	
MW148S	-	6/23/2020	5.304	4.798	0.461	
MW148S	-	11/17/2020 4:00	5.585	5.079	0.18	
MW148S	-	11/17/2020 4:00	5.585	5.079	0.18	
MW148S	-	6/21/2021 4:00	5.2	4.694	0.565	
MW148S	-	1/18/2022 16:36	5.467	4.961	0.298	
MW148S	-	6/20/2022	5.075	4.569	0.69	
MW148S	-	11/21/2022 4:00	5.41	4.904	0.355	
MW148S	-	1/19/2023 16:36	5.467	4.961	0.298	
MW148S	-	3/27/2023 16:36	5.467	4.961	0.298	
MW148S	-	6/26/2023	5.179	4.673	0.586	
MW151S	-	6/21/2018	2.813	2.374	0.587	
MW151S	-	11/27/2019 4:00	3.3	2.861	0.1	
MW151S	-	6/23/2020	3.16	2.721	0.24	
MW151S	-	11/16/2020 4:00	3.27	2.831	0.13	
MW151S	-	11/16/2020 4:00	3.27	2.831	0.13	
MW151S	-	6/21/2021 4:00	2.52	2.081	0.88	
MW151S	-	1/18/2022 14:39	3.175	2.736	0.225	
MW151S	-	6/20/2022	2.46	2.021	0.94	
MW151S	-	11/21/2022 4:00	3.2	2.761	0.2	
MW151S	-	1/19/2023 14:39	3.175	2.736	0.225	
MW151S	-	3/27/2023 14:39	3.175	2.736	0.225	
MW151S	-	6/26/2023	3.319	2.88	0.081	
MW152S	-	6/21/2018	2.86	2.341	0.55	
MW152S	-	11/27/2019 4:00	3.4	2.881	0.01	
MW152S	-	6/23/2020	3.16	2.641	0.25	
MW152S	-	11/16/2020 4:00	3.253	2.734	0.157	
MW152S	-	11/16/2020 4:00	3.253	2.734	0.157	
MW152S	-	6/22/2021 4:00	2.53	2.011	0.88	
MW152S	-	1/18/2022 15:14	3.173	2.654	0.237	
MW152S	-	6/20/2022	2.4	1.881	1.01	
MW152S	-	11/21/2022 4:00	3.18	2.661	0.23	
MW152S	-	1/19/2023 15:14	3.173	2.654	0.237	
MW152S	-	3/27/2023 15:14	3.173	2.654	0.237	
MW152S	-	6/26/2023	3.215	2.696	0.195	
MW153S	-	6/22/2018	4.314	3.732	0.473	
MW153S	-	8/19/2019	4.683	4.101	0.104	
MW153S	-	11/28/2019 4:00	4.7	4.118	0.087	
MW153S	-	6/23/2020	4.52	3.938	0.267	
MW153S	-	10/12/2020 14:50	4.676	4.094	0.111	
MW153S	-	11/16/2020 4:00	4.617	4.035	0.17	
MW153S	-	11/16/2020 4:00	4.617	4.035	0.17	
MW153S	-	6/22/2021 4:00	3.885	3.303	0.902	
MW153S	-	1/18/2022 7:09	4.541	3.959	0.246	
MW153S	-	6/20/2022	3.76	3.178	1.027	
MW153S	-	11/21/2022 4:00	4.02	3.438	0.767	
MW153S	-	1/19/2023 7:09	4.541	3.959	0.246	
MW153S	-	3/27/2023 7:09	4.541	3.959	0.246	
MW153S	-	6/26/2023	4.565	3.983	0.222	
MW153S	-	9/14/2023 10:50	7.491	6.909	-2.704	
MW154S	-	6/20/2018	3.377	2.808	0.441	
MW154S	-	8/20/2019	3.686	3.117	0.132	
MW154S	-	11/27/2019 4:00	3.7	3.131	0.118	
MW154S	-	6/23/2020	3.5	2.931	0.318	Put in Hydro sleeve
MW154S	-	10/12/2020 13:55	3.657	3.088	0.161	
MW154S	-	11/16/2020 4:00	3.61	3.041	0.208	
MW154S	-	11/16/2020 4:00	3.61	3.041	0.208	
MW154S	-	6/21/2021 4:00	2.77	2.201	1.048	
MW154S	-	1/18/2022 15:44	3.449	2.88	0.369	
MW154S	-	6/20/2022	2.805	2.236	1.013	
MW154S	-	11/21/2022 4:00	3.21	2.641	0.608	
MW154S	-	1/19/2023 15:44	3.449	2.88	0.369	
MW154S	-	3/27/2023 15:44	3.449	2.88	0.369	

MW154S	-	6/26/2023	3.39	2.821	0.428	
MW154S	-	9/14/2023 11:10	6.763	6.194	-2.945	
MW155S	-	6/22/2018	4.609	4.071	0.398	
MW155S	-	11/27/2019 4:00	4.9	4.362	0.107	
MW155S	-	6/23/2020	4.6	4.062	0.407	
MW155S	-	11/16/2020 4:00	4.813	4.275	0.194	
MW155S	-	11/16/2020 4:00	4.813	4.275	0.194	
MW155S	-	6/21/2021 4:00	3.725	3.187	1.282	
MW155S	-	1/18/2022 16:38	4.043	3.505	0.964	
MW155S	-	6/20/2022	4	3.462	1.007	
MW155S	-	11/21/2022 4:00	4.69	4.152	0.317	
MW155S	-	1/19/2023 16:38	4.043	3.505	0.964	
MW155S	-	3/27/2023 16:38	4.043	3.505	0.964	
MW155S	-	6/26/2023	3.95	3.412	1.057	
MW310	-	5/18/2011	4.51		0.89	
MW310	-	3/9/2018	4.907		0.494	
MW310	-	6/19/2018	4.893		0.508	
MW310	-	11/27/2019 4:00	5.8		-0.399	
MW310	-	6/23/2020	4.927		0.474	
MW310	-	10/12/2020 10:47	5.051		0.35	
MW310	-	11/17/2020 4:00	5.04		0.361	
MW310	-	11/17/2020 4:00	5.04		0.361	
MW310	-	6/21/2021 4:00	4.27		1.131	
MW310	-	1/18/2022 14:34	4.88		0.521	
MW310	-	6/20/2022	4.385		1.016	
MW310	-	11/21/2022 4:00	4.85		0.551	
MW310	-	1/19/2023 14:34	4.88		0.521	
MW310	-	3/27/2023 14:34	4.88		0.521	
MW310	-	6/26/2023	4.91		0.491	
MW311	-	5/18/2011	3.31	3.343	0.86	
MW311	-	6/19/2018	3.684	3.717	0.521	
MW311	-	9/30/2018	3.84	3.873	0.365	
MW311	-	8/13/2019	3.855	3.888	0.35	
MW311	-	11/27/2019 4:00	3.87	3.903	0.335	
MW311	-	6/23/2020	3.709	3.742	0.496	
MW311	-	11/17/2020 4:00	3.84	3.873	0.365	
MW311	-	11/17/2020 4:00	3.84	3.873	0.365	
MW311	-	6/21/2021 4:00	3.195	3.228	1.01	
MW311	-	1/18/2022 14:52	3.89	3.923	0.315	
MW311	-	6/20/2022	3.1	3.133	1.105	
MW311	-	11/21/2022 4:00	3.63	3.663	0.575	
MW311	-	1/19/2023 14:52	3.89	3.923	0.315	
MW311	-	3/27/2023 14:52	3.89	3.923	0.315	
MW311	-	6/26/2023	3.73	3.763	0.475	
MW311	-	9/16/2023 8:45	5.967	6	-1.762	
MW315	-	11/25/2005	7.585	7.257	0.433	
MW315	-	3/1/2016	7.55	7.222	0.468	
MW315	-	2/22/2018	7.48	7.152	0.538	
MW315	-	6/10/2018	7.416	7.088	0.602	
MW315	-	11/27/2019 4:00	7.62	7.292	0.398	
MW315	-	6/25/2020	7.475	7.147	0.543	
MW315	-	11/17/2020 4:00	7.59	7.262	0.428	
MW315	-	11/17/2020 4:00	7.59	7.262	0.428	
MW315	-	6/21/2021 4:00	7.159	6.831	0.859	
MW315	-	1/18/2022 13:56	7.44	7.112	0.578	
MW315	-	6/20/2022	7.1	6.772	0.918	
MW315	-	11/21/2022 4:00	7.4	7.072	0.618	
MW315	-	1/19/2023 13:56	7.44	7.112	0.578	
MW315	-	3/27/2023 13:56	7.44	7.112	0.578	
MW315	-	6/26/2023	7.47	7.142	0.548	
MW326	-	2/22/2018	2.36	2.349	0.251	
MW326	-	6/21/2018	2.09	2.079	0.521	
MW326	-	11/28/2019 4:00	2.5	2.489	0.111	
MW326	-	6/23/2020	2.405	2.394	0.206	
MW326	-	11/17/2020 4:00	2.437	2.426	0.174	
MW326	-	11/17/2020 4:00	2.437	2.426	0.174	
MW326	-	6/21/2021 4:00	1.845	1.834	0.766	
MW326	-	1/18/2022 9:04	2.333	2.322	0.278	
MW326	-	6/20/2022	1.67	1.659	0.941	no bore log - well depth unknown
MW326	-	11/21/2022 4:00	2.31	2.299	0.301	No bore log
MW326	-	1/19/2023 9:04	2.333	2.322	0.278	
MW326	-	3/27/2023 9:04	2.333	2.322	0.278	
MW326	-	6/26/2023	2.37	2.359	0.241	

		Field				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW022	**21 Feb 2018**	1.82	30.4	17	1,540	7.29
MW022	**09 Jun 2018**	1.39	30.3	-135.7	1,509	7.58
MW022	**27 Nov 2019**	5.83	28.7	98.1	17,900	7.6
MW022	**23 Jun 2020**	1.26	28.3	125.9	1,333	7.38
MW022	**22 Jun 2021**	1.99	28.1	96	899	7.97
MW022	**18 Jan 2022**	2.8	27.6	51.8	1,005	7.46
MW022	**20 Jun 2022**	1.26	27	-22	1,375	7.6
MW022	**21 Nov 2022**	2.08	27	17.3	645	6.92
MW022	**19 Jan 2023**	2.8	27.6	51.8	1,005	7.46
MW022	**27 Mar 2023**	2.8	27.6	51.8	1,005	7.46
MW022	**26 Jun 2023**	3.51	27.3	-42.2	785	7.34
MW103D	**09 Mar 2018**	0.21	33.7	-214.2	468	7.2
MW103D	**09 Jun 2018**	0.4	29.4	-168.9	4,560	7.31
MW103D	**27 Nov 2019**	4.18	30.3	2.1	6,491	7.65
MW103D	**23 Jun 2020**	1.96	30.7	-127.8	5,068	7.28
MW103D	**17 Nov 2020**	1.44	30.3	-82.6	6,656	7.01
MW103D	**21 Jun 2021**	1.55	27	88.6	5,535	7.22
MW103D	**18 Jan 2022**	3.42	27.5	158.2	5,034	7.46
MW103D	**20 Jun 2022**	0.53	29.1	-217.2	5,091	7.53
MW103D	**21 Nov 2022**	3.21	28.8	0.3	4,964	7.05
MW103D	**19 Jan 2023**	3.42	27.5	158.2	5,034	7.46
MW103D	**27 Mar 2023**	3.42	27.5	158.2	5,034	7.46
MW103D	**26 Jun 2023**	2.64	27.2	-70.1	4,780	7.36
MW105S	**09 Mar 2018**	0.63	33.5	-173.5	2,550	7.43
MW105S	**04 Jun 2018**	2.15	30.3	-21.6	1,980	7.54
MW105S	**18 Aug 2019**	2.99	26.9		2,740	7.47
MW105S	**27 Nov 2019**	4.57	29.6	85.6	1,497	7.4
MW105S	**21 Jun 2021**	1.64	25.1	-35	5,248	7.57
MW105S	**18 Jan 2022**	2.16	27.2	85	4,190	7.28
MW105S	**20 Jun 2022**	0.43	26.5	9.5	7,084	7.51
MW105S	**19 Jan 2023**	2.16	27.2	85	4,190	7.28
MW105S	**27 Mar 2023**	2.16	27.2	85	4,190	7.28
MW105S	**26 Jun 2023**	0.86	28.4	-0.8	2,662	7.42
MW108	**07 Mar 2018**	0.31	32.3	-212.4	12,140	7.36
MW108	**18 Jun 2018**	0.54	30.1	-95.9	13,197	7.56
MW108	**21 Nov 2022**	1.13	28.2	-158.6	11,918	7.62
MW108	**26 Jun 2023**	1.44	26.5	18.4	11,527	7.36
MW113	**10 Mar 2018**	0.19	32	-138	3,310	7.56
MW113	**09 Jun 2018**	0.19	30.7	16.8	3,720	7.79
MW113	**27 Nov 2019**	3.85	29.2	21.3	36,820	7.57
MW113	**23 Jun 2020**	1.57	29.9	82.2	3,259	7.6
MW113	**17 Nov 2020**	2.9	26.9	-7.6	3,795	7.41
MW113	**21 Jun 2021**	0.75	27.1	40.8	3,591	7.7
MW113	**18 Jan 2022**	2.14	26.7	90.3	3,439	7.79
MW113	**20 Jun 2022**	1.43	27.7	16.9	3,381	7.66
MW113	**21 Nov 2022**	1.58	28.5	48.8	3,221	7.41
MW113	**19 Jan 2023**	2.14	26.7	90.3	3,439	7.79
MW113	**27 Mar 2023**	2.14	26.7	90.3	3,439	7.79
MW113	**26 Jun 2023**	1.64	26.9	-45.3	2,905	7.64
MW115	**08 Mar 2018**	1.07	31.9	-79.4	5,464	7.4
MW115	**09 Jun 2018**	0.36	30.3	-14.9	5,290	7.47
MW115	**27 Nov 2019**	2.32	30	2.4	30,090	7.32
MW115	**23 Jun 2020**	2.49	30.1	12.7	5,089	7.34
MW115	**17 Nov 2020**	0.59	29.2	-89.7	5,906	7.01
MW115	**21 Jun 2021**	0.88	27.4	-181.1	5,254	7.27
MW115	**18 Jan 2022**	1.7	28.3	89.3	5,155	7.32
MW115	**20 Jun 2022**	12	27.7	198.9	4,912	7.47
MW115	**21 Nov 2022**	2.32	29.2	46.8	4,671	6.85
MW115	**19 Jan 2023**	1.7	28.3	89.3	5,155	7.32
MW115	**27 Mar 2023**	1.7	28.3	89.3	5,155	7.32
MW118D	**05 Mar 2018**	1.84	29.4	-9.6	4,309	7.82
MW118D	**09 Jun 2018**	0.49	30.2	9	3,534	7.79
MW118D	**27 Nov 2019**	2.41	30.3	3.6	4,144	7.94
MW118D	**23 Jun 2020**	1.7	27.6	124.5	4,756	7.54
MW118D	**16 Nov 2020**	2.48	30.2	-111	4,778	7.58
MW118D	**21 Jun 2021**	3.04	21.9	91.8	9,790	7.91
MW118D	**18 Jan 2022**	1.25	28.4	69.3	4,570	7.75
MW118D	**20 Jun 2022**	1.78	27.5	3.7	4,290	7.67
MW118D	**21 Nov 2022**	2	28.6	-6.2	4,243	7.23
MW118D	**19 Jan 2023**	1.25	28.4	69.3	4,570	7.75
MW118D	**27 Mar 2023**	1.25	28.4	69.3	4,570	7.75
MW118D	**26 Jun 2023**	2.91	27.9	-59.9	4,257	7.68
MW118D	**13 Sep 2023**	3.16	24.4	-56.1	4,269	7.79
MW122	**05 Mar 2018**	1.38	28.1	-153.9	9,423	7.7
MW122	**16 Jun 2018**	0.06	30.2	-122.1	9,690	7.66
MW122	**20 Aug 2019**	0.08	27.9		10,661	7.33

		Field				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW022	**21 Feb 2018**	1.82	30.4	17	1,540	7.29
MW122	**27 Nov 2019**	1.71	28.8	112.6	5,195	7.45
MW122	**23 Jun 2020**	1.01	29	-171.4	9,485	7.7
MW122	**12 Oct 2020**	0.65	29.9	65.5	9,527	7.43
MW122	**16 Nov 2020**	1.33	29.5	-148.5	9,602	7.33
MW122	**22 Jun 2021**	1.34	25.6	113.4	9,340	7.67
MW122	**18 Jan 2022**	3.28	24.4	82.2	8,170	7.59
MW122	**20 Jun 2022**	1.52	29	5.3	8,694	7.62
MW122	**21 Nov 2022**	1.69	27.9	-35.6	1,073	7.18
MW122	**19 Jan 2023**	3.28	24.4	82.2	8,170	7.59
MW122	**27 Mar 2023**	3.28	24.4	82.2	8,170	7.59
MW122	**26 Jun 2023**	2.57	28.1	27.7	8,495	7.5
MW122	**13 Sep 2023**	1.48	24.9	-42.1	8,675	7.54
MW126	**05 Mar 2018**	1.69	28.4	-160.8	1,314	8.04
MW126	**16 Jun 2018**	0.25	29.9	9.1	733	7.91
MW126	**27 Nov 2019**	2.21	29.9	33.6	6,223	7.67
MW126	**23 Jun 2020**	2.03	27.1	-124.7	8,487	7.62
MW126	**21 Jun 2021**	8.48	22.9	95	2,394	7.65
MW126	**18 Jan 2022**	2.39	27.2	110	1,027	7.53
MW126	**20 Jun 2022**	1.53	26.7	-104.3	2,858	7.48
MW126	**19 Jan 2023**	2.39	27.2	110	1,027	7.53
MW126	**27 Mar 2023**	2.39	27.2	110	1,027	7.53
MW126	**26 Jun 2023**	1.93	26.1	12.9	1,936	7.75
MW126	**13 Sep 2023**	2.69	24.6	-145.2	1,217	7.7
MW128	**05 Mar 2018**	0.08	30.9	-141	42,370	7.12
MW128	**05 Mar 2018**	0.1	31.2	-156.1	53,600	7.11
MW128	**05 Mar 2018**	0.1	30.7	-147.3	54,100	7.21
MW128	**15 Jun 2018**	0.07	29.1	-135.4	55,667	8.17
MW128	**15 Jun 2018**	0.09	28.9	-86.1	53,599	8.21
MW128	**15 Jun 2018**	0.29	28.5	-175.7	58,284	8.15
MW128	**27 Nov 2019**	2.02	31.4	50.3	55,165	7.32
MW128	**23 Jun 2020**	1.52	27.9	-84.3	53,920	7.11
MW128	**16 Nov 2020**	1.99	30.4	72.4	66,778	7.25
MW128	**21 Jun 2021**	2.05	26.3	68.7	52,736	7.35
MW128	**18 Jan 2022**	3.19	25.6	63.5	57,792	7.94
MW128	**20 Jun 2022**	1.38	26.8	19	55,186	7.44
MW128	**20 Nov 2022**	2.45	26.6	-68	56,467	7.73
MW128	**19 Jan 2023**	3.19	25.6	63.5	57,792	7.94
MW128	**27 Mar 2023**	3.19	25.6	63.5	57,792	7.94
MW128	**26 Jun 2023**	2.96	25.1	38.3	56,751	7.52
MW129	**05 Mar 2018**	0.19	32.3	-146.4	54,700	7.53
MW129	**05 Mar 2018**	0.2	33.3	-138.3	54,400	7.24
MW129	**05 Mar 2018**	0.71	32.2	-120.1	55,230	7.4
MW129	**21 Jun 2018**	0.29	27.2	44	57,705	7.37
MW129	**21 Jun 2018**	0.69	27.3	82.8	56,098	7.47
MW129	**21 Jun 2018**	0.86	28	26.2	5.224	7.5
MW129	**27 Nov 2019**	1.68	29.9	48.5	62,059	7.23
MW129	**23 Jun 2020**	1.64	29	-58.5	52,090	7.22
MW129	**16 Nov 2020**	1.77	31.9	164	55,082	5.97
MW129	**21 Jun 2021**	3.82	24.9		56,175	7.69
MW129	**18 Jan 2022**	2.17	27.9	105.5	55,917	7.46
MW129	**20 Jun 2022**	1.94	27.5	-59.9	58,507	7.27
MW129	**20 Nov 2022**	2.38	28.3	-58.4	56,161	7.39
MW129	**19 Jan 2023**	2.17	27.9	105.5	55,917	7.46
MW129	**27 Mar 2023**	2.17	27.9	105.5	55,917	7.46
MW129	**26 Jun 2023**	2.97	28.2	0.1	55,369	7.5
MW130	**05 Mar 2018**	0.08	38	-191.5	3,273	7.32
MW130	**05 Mar 2018**	0.23	36.2	-233.5	40,380	7.25
MW130	**05 Mar 2018**	0.29	31.2	-233.5	40,350	7.36
MW130	**20 Jun 2018**	0.03	28.7	-130.1	41,237	7.28
MW130	**20 Jun 2018**	0.1	29	-263.5	53,419	7.25
MW130	**20 Jun 2018**	1.11	25.7	-29.5	27,233	7.39
MW130	**23 Jun 2020**	1.53	29.9	-14.4	51,330	7.22
MW130	**16 Nov 2020**	1.71	30.5	174.1	52,796	6.95
MW130	**21 Jun 2021**	1.77	26.2	106.7	27,552	7.51
MW130	**18 Jan 2022**	1.24	30	17.2	52,620	7.41
MW130	**20 Jun 2022**	1.66	27.2	-98.1	51,587	7.47
MW130	**20 Nov 2022**	1.06	27.8	-107.4	52,744	7.38
MW130	**19 Jan 2023**	1.24	30	17.2	52,620	7.41
MW130	**27 Mar 2023**	1.24	30	17.2	52,620	7.41
MW130	**26 Jun 2023**	2.02	27.2	1	51,628	7.5
MW131	**10 Mar 2018**	0.33	33.8	-222.5	45,938	6.95
MW131	**10 Mar 2018**	0.47	33	-131.7	51,243	7.29
MW131	**10 Mar 2018**	0.68	33.1	-50.2	51,935	7.38
MW131	**10 Mar 2018**	0.75	35.9	-83.1	13,246	6.95
MW131	**20 Jun 2018**	0.25	28.3	-12.6	17,335	7.03

		Field				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW022	**21 Feb 2018**	1.82	30.4	17	1,540	7.29
MW131	**20 Jun 2018**	0.34	27.9	-147.1	54,072	7.28
MW131	**20 Jun 2018**	0.49	28.8	-93.8	53,840	7.19
MW131	**20 Jun 2018**	0.61	28.9	-142.9	49,220	7.02
MW131	**28 Nov 2019**	7.56	28.3	22.8	24,150	7.32
MW131	**23 Jun 2020**	1.93	30.3	-67.7	44,971	6.88
MW131	**16 Nov 2020**	1.88	31	22.2	47,306	7.12
MW131	**21 Jun 2021**	4.61	25	73	2,406	8.82
MW131	**18 Jan 2022**	3.52	30.5	93.1	5,010	7.99
MW131	**20 Jun 2022**	1.46	27.3	-40.5	3,791	7.88
MW131	**20 Nov 2022**	3.01	28.3	-57	4,300	7.92
MW131	**19 Jan 2023**	3.52	30.5	93.1	5,010	7.99
MW131	**27 Mar 2023**	3.52	30.5	93.1	5,010	7.99
MW131	**26 Jun 2023**	3.6	26.1	23	5,386	7.41
MW132	**10 Mar 2018**	0.78	29.4	-187.5	4,970	7.64
MW132	**10 Mar 2018**	0.85	30.2	-176.8	4,590	7.16
MW132	**10 Mar 2018**	6.97	35.1	-187.4	0.73	7.29
MW132	**21 Jun 2018**	0.12	27.7	-137.9	47,401	7.37
MW132	**21 Jun 2018**	0.54	27.5	-163.1	51,836	7.5
MW132	**27 Nov 2019**	2.36	29.5	16.9	49,920	7.23
MW132	**23 Jun 2020**	1.12	29.1	-158.5	49,521	7.71
MW132	**16 Nov 2020**	2.1	28.7	237.2	55,228	4.2
MW132	**21 Jun 2021**	3.04	25.3	117.5	52,310	7.68
MW132	**18 Jan 2022**	2.02	26.3	63.4	24,867	7.47
MW132	**20 Jun 2022**	3.25	26.8	-89.8	44,379	7.38
MW132	**21 Nov 2022**	0.9	24.8	-306.1	46,034	7.31
MW132	**19 Jan 2023**	2.02	26.3	63.4	24,867	7.47
MW132	**27 Mar 2023**	2.02	26.3	63.4	24,867	7.47
MW132	**26 Jun 2023**	0.73	27	-138.6	46,018	7.24
MW132	**13 Sep 2023**	0.74	28.2	15	50,156	7.14
MW133	**10 Mar 2018**	0.07	31	-163.3	5,030	7.04
MW133	**10 Mar 2018**	0.1	32	-193.6	4,420	7.02
MW133	**10 Mar 2018**	0.11	31.2	-164.5	4,370	7.05
MW133	**21 Jun 2018**	0.12	29.4	-107.6	52,722	7.07
MW133	**21 Jun 2018**	0.19	29.2	-80.5	56,861	7.13
MW133	**21 Jun 2018**	0.83	28.8	-40.4	47,145	7.38
MW133	**27 Nov 2019**	10.9	25.4	54.4	4,900	7.52
MW133	**23 Jun 2020**	2.55	28.8	114.3	51,059	7.29
MW133	**16 Nov 2020**	1.54	30.2	199.7	53,972	7.36
MW133	**21 Jun 2021**	2.65	25.4	37.7	11,951	7.85
MW133	**18 Jan 2022**	1.69	26.9	55.6	6,161	7.96
MW133	**20 Jun 2022**	3.14	24.5	-56.6	47,104	7.65
MW133	**21 Nov 2022**	2.88	25.1	-77.4	49,297	7.38
MW133	**19 Jan 2023**	1.69	26.9	55.6	6,161	7.96
MW133	**27 Mar 2023**	1.69	26.9	55.6	6,161	7.96
MW133	**26 Jun 2023**	3.32	24.2	-74.3	46,551	7.32
MW134	**09 Mar 2018**	0.83	32.5	-11.1	41,957	6.98
MW134	**09 Mar 2018**	0.85	32.2	-59.1	42,280	6.95
MW134	**22 Jun 2018**	0.12	28.8	-216.9	44,842	6.83
MW134	**22 Jun 2018**	0.83	29.2	-56.6	45,914	7.02
MW134	**13 Aug 2019**	0.19	29.5			6.6
MW134	**27 Nov 2019**	5.9	33.5	6.5	27,230	6.85
MW134	**23 Jun 2020**	0.124	29.4	-145	42,021	6.94
MW134	**17 Nov 2020**	2.63	29.6	27.6	49,581	6.95
MW134	**21 Jun 2021**	2.42	23.9	43.5	41,780	7.04
MW134	**18 Jan 2022**	3.8	29.3	-7.4	42,715	7.32
MW134	**20 Jun 2022**	1.74	27.4	44.3	42,572	7.07
MW134	**21 Nov 2022**	1.89	29.1	-92.1	40,995	7.07
MW134	**19 Jan 2023**	3.8	29.3	-7.4	42,715	7.32
MW134	**27 Mar 2023**	3.8	29.3	-7.4	42,715	7.32
MW134	**26 Jun 2023**	1.22	26.9	-6.5	42,969	6.92
MW135	**09 Mar 2018**	2.14	41	5	20,747	7.29
MW135	**22 Jun 2018**	0.22	29.5	-87.2	21,561	7.34
MW135	**22 Jun 2018**	0.69	30.1	-89.5	23,185	7.3
MW135	**27 Nov 2019**	2.15	30.2	33.6	16,082	7.07
MW135	**17 Nov 2020**	1.05	30.6	-86.2	28,725	7.77
MW135	**21 Jun 2021**	1.2	27.3	33.6	25,098	7.33
MW135	**18 Jan 2022**	4.03	28.6	-8.5	22,787	7.47
MW135	**20 Jun 2022**	3.63	28.7	44.2	23,548	7.5
MW135	**21 Nov 2022**	2.82	31.7	-77.1	22,765	7.49
MW135	**19 Jan 2023**	4.03	28.6	-8.5	22,787	7.47
MW135	**27 Mar 2023**	4.03	28.6	-8.5	22,787	7.47
MW135	**26 Jun 2023**	1.83	28.6	-1.1	21,770	7.22
MW137	**09 Mar 2018**	0.45	33.5	-193.8	20,666	6.92
MW137	**09 Mar 2018**	0.61	32.6	-39.7	35,796	6.98
MW137	**09 Mar 2018**	0.61	31.9	-178.5	25,941	6.94

		Field				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW022	**21 Feb 2018**	1.82	30.4	17	1,540	7.29
MW137	**22 Jun 2018**	0.27	29.8	-74.7	42,593	6.98
MW137	**22 Jun 2018**	0.28	29.9	-61.1	21,958	6.93
MW137	**22 Jun 2018**	0.31	29.6	-126.2	30,601	6.9
MW137	**27 Nov 2019**	9.18	29.7	4.6	11,590	6.91
MW137	**23 Jun 2020**	1.68	29.7	-81.3	22,149	7.29
MW137	**16 Nov 2020**	1.35	31	-204.1	23,570	7.04
MW137	**21 Jun 2021**	1.34	27.9	-6.7	21,137	7.23
MW137	**18 Jan 2022**	1.88	28.7	94.2	20,957	7.17
MW137	**20 Jun 2022**	3.52	27.1	15.7	21,121	7.27
MW137	**21 Nov 2022**	4.35	26.6	-77.2	13,083	7.68
MW137	**19 Jan 2023**	1.88	28.7	94.2	20,957	7.17
MW137	**27 Mar 2023**	1.88	28.7	94.2	20,957	7.17
MW137	**26 Jun 2023**	2.99	28	-61	13,525	7.38
MW142	**27 Nov 2019**	4.04	28.7	4.6	2,955	7.18
MW142	**23 Jun 2020**	2.16	27.8	56.2	5,153	6.98
MW142	**17 Nov 2020**	0.88	29.5	211.6	3,115	7.14
MW142	**21 Jun 2021**	1.2	25.9	143.8	5,796	7
MW142	**18 Jan 2022**	1.77	27.1	71.5	5,699	7.11
MW142	**20 Jun 2022**	2.1	26.2	1.4	6,576	7.09
MW142	**21 Nov 2022**	1.37	29	-3.4	5,934	6.41
MW142	**19 Jan 2023**	1.77	27.1	71.5	5,699	7.11
MW142	**27 Mar 2023**	1.77	27.1	71.5	5,699	7.11
MW142	**26 Jun 2023**	2.94	27.8	-60.5	13,515	7.35
MW143	**23 Jun 2018**	4.46	29.5	63.8	1,314	8.05
MW143	**27 Nov 2019**	4.1	30.7	9.3	14,770	8.1
MW143	**23 Jun 2020**	2.1	29.4	30.2	1,339	8.16
MW143	**17 Nov 2020**	1.34	31	175.7	1,562	8.28
MW143	**21 Jun 2021**	2.1	26.2	0.3	1,611	8.12
MW143	**18 Jan 2022**	3.5	27.1	70	1,228	7.97
MW143	**20 Jun 2022**	2.7	27.8	-39.6	1,594	8.16
MW143	**21 Nov 2022**	4.82	28.8	2	915	7.26
MW143	**19 Jan 2023**	3.5	27.1	70	1,228	7.97
MW143	**27 Mar 2023**	3.5	27.1	70	1,228	7.97
MW143	**26 Jun 2023**	5.19	26.8	-50	993	7.9
MW144S	**23 Jun 2018**	0.16	28.4	-131.3	3,398	7.68
MW144S	**28 Nov 2019**	2.56	28.3	87.2	2,729	7.65
MW144S	**25 Jun 2020**	0.7	29.2	107.4	1,930.5	7.86
MW144S	**17 Nov 2020**	0.46	28.4	169.8	5,262	7.74
MW144S	**21 Jun 2021**	3.73	22.7	94.3	1,569	7.95
MW144S	**18 Jan 2022**	1.57	27.5	68.3	2,479	7.66
MW144S	**20 Jun 2022**	1.19	27.9	-3.4	2,630	7.92
MW144S	**21 Nov 2022**	1.68	28.2	-150.6	3,977	7.91
MW144S	**19 Jan 2023**	1.57	27.5	68.3	2,479	7.66
MW144S	**27 Mar 2023**	1.57	27.5	68.3	2,479	7.66
MW144S	**26 Jun 2023**	1.4	27.2	-17	2,215	7.75
MW145	**20 Jun 2018**	2.56	29.3	40.5	51,189	7.02
MW145	**27 Nov 2019**	2.51	29.8	151.1	15,300	7.06
MW145	**25 Jun 2020**	1.98	29.5	88.7	33,215	7.13
MW145	**17 Nov 2020**	1.96	28.1	74.4	54,683	6.82
MW145	**21 Jun 2021**	2.79	25.1	105.8	53,180	7.12
MW145	**18 Jan 2022**	1.86	29.1	-26	51,597	6.95
MW145	**20 Jun 2022**	2.35	27.2	35.6	46,930	7.09
MW145	**21 Nov 2022**	1.43	28	-73.4	49,182	7.14
MW145	**19 Jan 2023**	1.86	29.1	-26	51,597	6.95
MW145	**27 Mar 2023**	1.86	29.1	-26	51,597	6.95
MW145	**26 Jun 2023**	1.16	27.1	36.4	49,817	6.99
MW147	**21 Jun 2018**	0.16	28.9	-302.4	36,989	7.4
MW147	**27 Nov 2019**	2.42	31.1	102.9	21,370	6.97
MW147	**23 Jun 2020**		30.2			
MW147	**17 Nov 2020**	1.59	28.6	5	40,108	5.73
MW147	**22 Jun 2021**	1.38	21.4	-52.5	36,568	7.04
MW147	**18 Jan 2022**	2.01	28.9	-107	36,840	7.11
MW147	**20 Jun 2022**	1.58	26.4	39.1	36,649	7.17
MW147	**21 Nov 2022**	1.04	28.4	-130.8	33,336	7.07
MW147	**19 Jan 2023**	2.01	28.9	-107	36,840	7.11
MW147	**27 Mar 2023**	2.01	28.9	-107	36,840	7.11
MW147	**26 Jun 2023**	1.52	27.9	-6.8	35,366	6.94
MW148S	**21 Jun 2018**	0.37	29.5	-267.2	46,732	7.01
MW148S	**13 Aug 2019**	1.37	29.3		51,545	6.78
MW148S	**27 Nov 2019**	2.46	29.4	150.5	24,805	6.95
MW148S	**23 Jun 2020**	1.35	28.7	22	27,742	6.95
MW148S	**17 Nov 2020**	1.98	30.2	14.7	50,867	7.8
MW148S	**21 Jun 2021**	1.97	24	-43.5	35.983	7.01
MW148S	**18 Jan 2022**	3.3	29.4	37	43,569	7.08
MW148S	**20 Jun 2022**	1.06	27.6	42.6	41,864	6.98

		Field				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW022	**21 Feb 2018**	1.82	30.4	17	1,540	7.29
MW148S	**21 Nov 2022**	2.33	29.5	-80.4	42,330	7.08
MW148S	**19 Jan 2023**	3.3	29.4	37	43,569	7.08
MW148S	**27 Mar 2023**	3.3	29.4	37	43,569	7.08
MW148S	**26 Jun 2023**	1.83	28	6.1	42,922	7.02
MW151S	**21 Jun 2018**	2.69	29	105.2	58,393	7.13
MW151S	**27 Nov 2019**	1.36	31	30.7	61,064	7.05
MW151S	**23 Jun 2020**	1.2	30.7	-61.8		7
MW151S	**16 Nov 2020**	0.36	30	76.7	55,266	7.14
MW151S	**21 Jun 2021**	2.11	28.3	91.8	28,714	7.27
MW151S	**18 Jan 2022**	1.38	29.3	46.1	55,183	7.38
MW151S	**20 Jun 2022**	1.4	29.9	-49.1	54,421	7.21
MW151S	**21 Nov 2022**	1.01	29.3	-92	54,026	7.18
MW151S	**19 Jan 2023**	1.38	29.3	46.1	55,183	7.38
MW151S	**27 Mar 2023**	1.38	29.3	46.1	55,183	7.38
MW151S	**26 Jun 2023**	1.95	26.3	7.2	55,378	7.12
MW152S	**21 Jun 2018**	0.12	28.8	69	53,519	7.25
MW152S	**27 Nov 2019**	2.69	32	16.5	53,195	7.02
MW152S	**23 Jun 2020**	0.98	30.1	-69		7.01
MW152S	**16 Nov 2020**	1.66	29.2	-33.3	55,686	7.09
MW152S	**22 Jun 2021**	1.03	27.3	140	51,252	7.39
MW152S	**18 Jan 2022**	3.31	29.5	-3.7	51,162	7.75
MW152S	**20 Jun 2022**	0.83	29.2	-94	50,110	7.14
MW152S	**21 Nov 2022**	1.09	29.5	-112	49,301	7.33
MW152S	**19 Jan 2023**	3.31	29.5	-3.7	51,162	7.75
MW152S	**27 Mar 2023**	3.31	29.5	-3.7	51,162	7.75
MW152S	**26 Jun 2023**	6.23	27.1	3.7	25,961	7.21
MW153S	**22 Jun 2018**	0.1	28.7	62.8	51,348	7.15
MW153S	**19 Aug 2019**	0.2	27.2		52,224	6.92
MW153S	**28 Nov 2019**	2.11	29	94.2	48,614	6.9
MW153S	**23 Jun 2020**	0.63	29.3	-129.5		6.76
MW153S	**12 Oct 2020**	0.29	30.4	-29.5	51,850	6.62
MW153S	**16 Nov 2020**	1.44	28.9	1.1	50,566	6.61
MW153S	**22 Jun 2021**	2.77	20.3	81.4	49,053	7.22
MW153S	**18 Jan 2022**	4.05	26.5	-47.6	46,181	7.21
MW153S	**20 Jun 2022**	1.31	28.3	-79.3	45,118	7.31
MW153S	**21 Nov 2022**	3.7	29	10.9	47,262	6.98
MW153S	**19 Jan 2023**	4.05	26.5	-47.6	46,181	7.21
MW153S	**27 Mar 2023**	4.05	26.5	-47.6	46,181	7.21
MW153S	**26 Jun 2023**	0.84	28.3	13.4	46,370	6.96
MW153S	**14 Sep 2023**	2.04	30.4	-173.2	50,872	6.87
MW154S	**20 Jun 2018**	0.69	28.9	150.7	21,806	7.16
MW154S	**20 Aug 2019**	0.6	25.6		22,530	6.97
MW154S	**27 Nov 2019**	2.61	29.7	8.5	15,950	7.24
MW154S	**23 Jun 2020**	1.19	28	117	14,436.5	7.03
MW154S	**12 Oct 2020**	0.7	31.3	119.8	26,651	6.95
MW154S	**16 Nov 2020**	1.98	30.7	46.1	25,439	6.72
MW154S	**21 Jun 2021**	1.42	22.7	-10.2	25,513	7.04
MW154S	**18 Jan 2022**	1.68	29.3	71.9	29,176	7.04
MW154S	**20 Jun 2022**	0.69	25.2	-117.5	26,707	6.88
MW154S	**21 Nov 2022**	0.76	27.9	43.2	29,756	5.89
MW154S	**19 Jan 2023**	1.68	29.3	71.9	29,176	7.04
MW154S	**27 Mar 2023**	1.68	29.3	71.9	29,176	7.04
MW154S	**26 Jun 2023**	1.2	28.6	-39.7	27,551	6.76
MW154S	**14 Sep 2023**	1.02	27.3	-12.6	26,811	6.85
MW155S	**22 Jun 2018**	0.3	29.5	88.4	20,710	6.95
MW155S	**27 Nov 2019**	4.3	30.1	33.4	3,170	7.08
MW155S	**23 Jun 2020**	2.17	30.6	-49.2	18,421	7.03
MW155S	**16 Nov 2020**	1.07	30.3	-11	28,076	6.56
MW155S	**21 Jun 2021**	1.1	28	67.3	29,625	7.03
MW155S	**18 Jan 2022**	0.8	29.2	162.1	24,650	6.79
MW155S	**20 Jun 2022**	0.98	28.4	-127.3	17,307	7.13
MW155S	**21 Nov 2022**	0.55		-109.2	19,186	6.96
MW155S	**19 Jan 2023**	0.8	29.2	162.1	24,650	6.79
MW155S	**27 Mar 2023**	0.8	29.2	162.1	24,650	6.79
MW155S	**26 Jun 2023**	0.93	27.6	-75.6	22,409	6.79
MW310	**09 Mar 2018**	0.82	32.2	-127.5	3,930	7.37
MW310	**18 Jun 2018**	2.13	31.1	-8.6	4,231	7.36
MW310	**27 Nov 2019**	5.24	29.7	-249.2	18,100	7.57
MW310	**23 Jun 2020**	1.38	28.8	71.7	2,444	7.49
MW310	**12 Oct 2020**	4.12	30.7	100.1	4,508	7.45
MW310	**17 Nov 2020**	2.23	31.3	178.8	3,172	7.64
MW310	**21 Jun 2021**	1.73	28.1	166.5	3,120	7.45
MW310	**18 Jan 2022**	2.46	29.6	70.4	3,698	7.53
MW310	**20 Jun 2022**	2.08	30.1	-15.6	3,391	7.47
MW310	**21 Nov 2022**	2.6	29.5	48.6	3,351	6.96

		Field				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
MW022	**21 Feb 2018**	1.82	30.4	17	1,540	7.29
MW310	**19 Jan 2023**	2.46	29.6	70.4	3,698	7.53
MW310	**27 Mar 2023**	2.46	29.6	70.4	3,698	7.53
MW310	**26 Jun 2023**	3.2	26.9	-40.5	3,654	7.44
MW311	**18 Jun 2018**	3.62	30.2	0.1	701	7.49
MW311	**30 Sep 2018**	4.67	28.3		694	7.62
MW311	**13 Aug 2019**	3.81	28.5		710	7.68
MW311	**27 Nov 2019**	5.25	28.4	5.7	10,100	7.89
MW311	**23 Jun 2020**	4.02	30.1	54	507	7.84
MW311	**17 Nov 2020**	2.49	30.4	183.4	1,360	7.77
MW311	**21 Jun 2021**	4.6	25.9	125.2	918	7.65
MW311	**18 Jan 2022**	4.12	28.4	61.2	497	7.97
MW311	**20 Jun 2022**	4.04	27.8	17.8	514	7.73
MW311	**21 Nov 2022**	3.85	28.7	22.2	480	7.87
MW311	**19 Jan 2023**	4.12	28.4	61.2	497	7.97
MW311	**27 Mar 2023**	4.12	28.4	61.2	497	7.97
MW311	**26 Jun 2023**	3.16	27.6	-35.7	507	7.91
MW311	**16 Sep 2023**	3.95	26.7	-60.8	436.3	7.86
MW315	**22 Feb 2018**	4.47	30.7	36	1,280	8.09
MW315	**10 Jun 2018**	5.11	30	31.8	1,405	8.29
MW315	**27 Nov 2019**	5.37	30.8	31.4	70,200	8
MW315	**25 Jun 2020**	6.6	29.8	82.8	1,898	8.06
MW315	**17 Nov 2020**	6.73	30.4	24.7	2,843	9
MW315	**21 Jun 2021**	3.53	21.4	58.6	1,512	8.13
MW315	**18 Jan 2022**	2.87	28.8	54.7	1,520	7.97
MW315	**20 Jun 2022**	3.04	27.3	-52	1,799	7.97
MW315	**21 Nov 2022**	2.71	28.7	31.6	1,590	7.51
MW315	**19 Jan 2023**	2.87	28.8	54.7	1,520	7.97
MW315	**27 Mar 2023**	2.87	28.8	54.7	1,520	7.97
MW315	**26 Jun 2023**	3.74	27.7	-69.9	1,600	7.99
MW326	**22 Feb 2018**	0.13	31.8	-62.1	39,910	6.84
MW326	**21 Jun 2018**	0.05	30.5	-131.3	42,780	7.05
MW326	**28 Nov 2019**	2.1	30	-65.5	40,739	7
MW326	**23 Jun 2020**	1.43	29.2	-80.9	24,687	7.1
MW326	**17 Nov 2020**	0.49	29.3	-107.2	44,266	6.82
MW326	**21 Jun 2021**	0.95	25.2	-129	40,600	7
MW326	**18 Jan 2022**	1.44	26.7	-37.4	39,339	7.15
MW326	**20 Jun 2022**	0.94	26.3	29.8	30,407	7.11
MW326	**21 Nov 2022**	0.66	29	-134.3	36,512	7.44
MW326	**19 Jan 2023**	1.44	26.7	-37.4	39,339	7.15
MW326	**27 Mar 2023**	1.44	26.7	-37.4	39,339	7.15
MW326	**26 Jun 2023**	1.42	27	21.5	38,737	7.28

		Field				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
OTH101	**26 Feb 2018**	3.21	30.8		28,440	7.79
OTH101	**21 Jun 2018**	4.08	21.4		47,574	7.96
OTH101	**28 Nov 2019**	4.26	29	30.6	32,334	7.53
OTH101	**26 Jun 2020**	4.9	23.1	118.2	36,205	7.92
OTH101	**26 Jun 2020**	4.9	23.1	118.2	53,698	7.92
OTH101	**16 Nov 2020**	3.97	28.2	214.2	65,166	5.4
OTH101	**21 Jun 2021**	5.37	18.8	91.8	54,570	7.61
OTH101	**22 Nov 2021**	6.03	22.9	60.9	56,245	8.22
OTH101	**20 Jun 2022**	5.09	21.5	-30.8	53,685	7.83
OTH101	**20 Nov 2022**	3.45	19.2	-37.2	55,494	8.06
OTH101	**26 Jun 2023**	3.46	21.6	27.8	55,453	8.13
OTH102	**26 Feb 2018**	2.44	31.3		54,600	7.92
OTH102	**21 Jun 2018**	4.64	19.5		47,501	8.04
OTH102	**28 Nov 2019**	4	29.4	3	57,124.6	7.74
OTH102	**26 Jun 2020**	5.09	21.5	121.2	36,078	8.84
OTH102	**26 Jun 2020**	5.09	21.5	121.2	51,778	7.84
OTH102	**16 Nov 2020**	4.08	29.1	224.8	65,705	5.12
OTH102	**21 Jun 2021**	5.36	19.4	122.2	53,613	7.72
OTH102	**22 Nov 2021**	6.07	23.3	65	57,607	8.39
OTH102	**20 Jun 2022**	3.55	22.2	-68.6	53,756	7.55
OTH102	**20 Nov 2022**	3.6	21.9	-23.4	54,368	8.12
OTH102	**26 Jun 2023**	8.36	16.2	-1.2	57,241	7.78
OTH103	**26 Feb 2018**	3.03	28.1		54,700	7.77
OTH103	**21 Jun 2018**	4.53	19.8		46,160	8.13
OTH103	**28 Nov 2019**	5.19	29	12	29,309	7.89
OTH103	**26 Jun 2020**	4.8	20.9	137.5	35,815	7.86
OTH103	**26 Jun 2020**	4.8	20.9	137.5	50,855	7.86
OTH103	**16 Nov 2020**	4.08	27.3	164.8	62,149	6.48
OTH103	**21 Jun 2021**	4.63	21.8	105.1	56,048	7.95
OTH103	**22 Nov 2021**	6.28	24	67.1	56,685	8.29
OTH103	**20 Jun 2022**	5	20.1	-45.2	53,450	7.54
OTH103	**20 Nov 2022**	4.16	22.9	-54.2	55,347	8.19
OTH103	**26 Jun 2023**	7.61	16.4	-2.4	56,827	7.93
OTH104	**26 Feb 2018**	4.79	27.4		54,600	7.93
OTH104	**21 Jun 2018**	3.94	21		47,280	8.06
OTH104	**28 Nov 2019**	6.29	29	1.5	29,660	7.85
OTH104	**26 Jun 2020**	4.46	20.7	133.8	35,019	7.86
OTH104	**26 Jun 2020**	4.46	20.7	133.8	50,894	7.86
OTH104	**16 Nov 2020**	4.15	26	246.3	63,120	4.42
OTH104	**21 Jun 2021**	4.28	22.2	126.3	28,534	7.92
OTH104	**22 Nov 2021**	5.27	23.3	69.3	56,721	8.22
OTH104	**20 Jun 2022**	4.47	21.5	-84.9	54,281	7.98
OTH104	**20 Nov 2022**	4.37	23.5	-63.5	55,345	8.16
OTH104	**26 Jun 2023**	3.85	20.3	37.3	54,785	8.13
OTH105	**26 Feb 2018**	3.66	28.9		54,700	7.91
OTH105	**21 Jun 2018**	5.07	19		46,947	8.1
OTH105	**28 Nov 2019**	3.8	27.7	20.4	29,734	7.83
OTH105	**26 Jun 2020**	3.63	20	149.1	36,140	7.83
OTH105	**26 Jun 2020**	3.63	20	149.1	50,274	7.83
OTH105	**16 Nov 2020**	3.91	26.4	-7.6	62,714	8.91
OTH105	**21 Jun 2021**	4.31	22.3	121.9	53,880	7.91
OTH105	**22 Nov 2021**	4.83	24.7	75.3	56,724	8.22
OTH105	**20 Jun 2022**	4.91	21.5	-49.7	53,024	7.84
OTH105	**20 Nov 2022**	3.9	24.8	-45.4	54,757	8.09
OTH105	**26 Jun 2023**	7.44	16.6	0.2	57,485	7.92
OTH106	**26 Feb 2018**	3.48	30.5		41,000	7.93
OTH106	**21 Jun 2018**	4.26	19.1		47,426	8.06
OTH106	**28 Nov 2019**	9.21	28.3	124	22,000	7.87
OTH106	**26 Jun 2020**	4.76	22.9	125.4	35,685	7.98
OTH106	**26 Jun 2020**	4.76	22.9	125.4	52,710	7.98
OTH106	**16 Nov 2020**	3.99	26.3	81.3	62,445	7.44
OTH106	**21 Jun 2021**	3.77	22.1	113.2	56,044	7.33
OTH106	**20 Jun 2022**	4.61	22.2	-46	53,673	7.95
OTH106	**20 Nov 2022**	3.89	24	-55.2	55,181	8.09
OTH106	**26 Jun 2023**	3.98	20.6	34.1	54,792	8.15

		Field				
		DO (Field)	Temperature (Field)	Redox Potential (Field)	Electrical Conductivity (field)	pH (Field)
		mg/L	°C	mV	µS/cm	pH Units
Location Code	**Date**					
SW161	**12 Mar 2018**	116		34.7	7.1	
SW161	**12 Mar 2018**	116		34.7	7.1	
SW161	**23 Jun 2018**	7.69	19.6	5.7	34,291	9.01
SW161	**23 Jun 2018**	7.69	19.6	5.7	34,291	9.01
SW161	**26 May 2020**	4.1	23.1	147.8	57,199	8.17
SW161	**23 Jun 2020**	2.18	18.2	-50.4	107,041	8.48
SW161	**03 Mar 2021**	3.23	34.9	79.2	42,812	7.89
SW161	**21 Jun 2021**	5.04	19.4	80.2	10,885	8
SW161	**22 Nov 2021**	0.58	22.1	75.2	133,254	8.15
SW161	**16 May 2022**	4.51	21.8	155.6	54,026	6.34
SW161	**20 Jun 2022**	7.19	23.5	-52.8	10,617	8.53
SW162	**23 Jun 2018**	4.98	19.1	-60.6	33,359	8.93
SW162	**23 Jun 2018**	4.98	19.1	-60.6	33,359	8.93
SW162	**26 May 2020**	3.04	24.7	140.7	58,199	8.15
SW162	**23 Jun 2020**	3.07	21.5	-64.4	103,811	8.22
SW162	**03 Mar 2021**	2.69	34.5	79	55,574	7.71
SW162	**03 Mar 2021**	2.69	34.5	79	55,574	7.71
SW162	**21 Jun 2021**	5.38	19.8	109.1	10,432	7.77
SW162	**22 Nov 2021**	5.13	22.5	66.7	106,375	7.99
SW162	**16 May 2022**	3.33	21.4	104.2	53,700	
SW162	**20 Jun 2022**	7.22	23.1	-28.9	9,978	8.58
SW163	**23 Jun 2018**	5.4	19.5	56.4	33,669	8.8
SW163	**23 Jun 2018**	5.4	19.5	56.4	33,669	8.8
SW163	**26 May 2020**	3.51	24.4	141.7	58,089	8.03
SW163	**23 Jun 2020**	3.18	22.5	-70.2	101,024	8.15
SW163	**03 Mar 2021**	1.13	35.1	72.3	56,275	7.56
SW163	**21 Jun 2021**	4.14	19.2	99.5	10,904	7.86
SW163	**22 Nov 2021**	0.88	24.4	89.8	208,570	7.73
SW163	**16 May 2022**	5.16	22.2	252.1	62,606	
SW163	**20 Jun 2022**	6.6	25.6	11.5	10,425	8.57
SW164	**12 Mar 2018**	7.32	27.9	97.4	180.2	8.94
SW164	**12 Mar 2018**	7.32	27.9	97.4	180.2	8.94
SW164	**19 Jun 2018**	6.27	20.4	-49.3	99.6	6.47
SW164	**19 Jun 2018**	6.27	20.4	-49.3	99.6	6.47
SW164	**25 May 2020**	9.87	23.1	265.7	249.1	6.43
SW164	**16 May 2022**	3.61	21.7	83.9	238.6	7.35
SW164	**20 Jun 2022**	5.76	19.8	61.8	142.3	8.56
SW181	**08 Jun 2018**	65	23.4	71.7	67.1	8.29
SW181	**08 Jun 2018**	65	23.4	71.7	67.1	8.29
SW181	**26 May 2020**	4.22	24.7	134.4	58,144	8.14
SW181	**23 Jun 2020**	3.14	25.5	87.5	80,069	7.93
SW181	**16 Nov 2020**	1.94	30.6	121	145,060	8.51
SW181	**03 Mar 2021**	4.21	31.7	103.6	70,491	8.26
SW181	**21 Jun 2021**	2.44	22.1	92.5	55,900	7.64
SW181	**22 Nov 2021**	4.29	24.4	77.4	58,515	8.18
SW181	**16 May 2022**	3.34	20.8	61.4	52,248	7.71
SW181	**20 Jun 2022**	2.46	23	-39.3	52,360	7.76
SW181	**20 Nov 2022**	0	29.3	-16.6	108,660	8.15
SW181	**26 Jun 2023**	6.4	21.3	-76.9	56,781	7.85

					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids								
					Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Interim Marine 99%									0.00023						19				
PFAS NEMP 2020 Recreational Water															**10**				
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**															
MW022	**21 Feb 2018**	**0082_MW22_180221**	**Normal**	**207287**	0.2	0.21	1.7	0.16	3.2	<0.002	0.3	0.79	0.94	0.59	0.33	0.12	<0.002	<0.002	<0.005
MW022	**09 Jun 2018**	**0082_MW22_180609**	**Normal**	**212095**	0.12	0.15	1.4	0.13	1.6	<0.002	0.33	0.86	0.81	0.61	0.32	0.18	0.002	<0.002	<0.005
MW022	**27 Nov 2019**	**0082_MW22_191127**	**Normal**	**EP1912548**	0.10	0.11	1.39	0.06	2.33	<0.02	0.3	0.72	1.00	0.64	0.37	0.22	<0.02	<0.02	<0.02
MW022	**27 Nov 2019**	**0082_QC104_191127**	**Field Duplicate**	**EP1912548**	0.10	0.12	1.46	0.06	2.41	<0.02	0.3	0.76	0.99	0.62	0.40	0.22	<0.02	<0.02	<0.02
MW022	**27 Nov 2019**	**0082_QC204_191127**	**Interlab Duplicate**	**691496**	0.10	0.12	1.1	0.07	2.4	<0.01	0.27	0.73	0.81	0.66	0.44	0.18	<0.01	<0.01	<0.01
MW022	**23 Jun 2020**	**0082_MW022_200623**	**Normal**	**EP2006549**	0.16	0.25	2.39	0.10	4.10	<0.02	0.5	1.21	1.49	1.31	0.81	0.36	<0.02	<0.02	<0.02
MW022	**22 Jun 2021**	**0082_MW022_210622**	**Normal**	**EP2107092**	0.09	0.12	1.31	0.07	3.19	<0.02	0.3	0.88	0.95	0.81	0.56	0.36	<0.02	<0.02	<0.02
MW022	**22 Nov 2021**	**0082_MW022_211122**	**Normal**	**EP2114224**	0.13	0.08	1.49	0.07	3.75	<0.02	0.3	0.88	1.23	0.82	0.61	0.45	<0.02	<0.02	<0.02
MW022	**20 Jun 2022**	**0082_MW022_220620**	**Normal**	**EP2207563**	0.07	0.08	1.11	0.07	4.14	<0.02	0.3	0.67	0.71	0.64	0.48	0.57	<0.02	<0.02	<0.02
MW022	**21 Nov 2022**	**0082_MW022_221121**	**Normal**	**EP2215715**	<0.02	0.02	0.36	0.02	2.39	<0.02	<0.1	0.12	0.12	0.17	0.18	0.24	<0.02	<0.02	<0.02
MW022	**26 Jun 2023**	**0082_MW022_230626**	**Normal**	**EP2308618**	0.03	0.05	0.55	0.03	3.34	<0.02	0.1	0.26	0.30	0.26	0.21	0.16	<0.02	<0.02	<0.02
MW103D	**09 Mar 2018**	**0082_MW103D_180309**	**Normal**	**208025**	0.22	0.26	3.3	0.28	13	0.003	0.14	0.28	0.68	0.16	0.14	0.047	<0.002	<0.002	<0.005
MW103D	**09 Mar 2018**	**0082_QC1404_180309**	**Field Duplicate**	**208025**	0.23	0.26	3.1	0.88	13	0.003	0.15	0.28	0.69	0.17	0.15	0.056	<0.002	<0.002	<0.005
MW103D	**09 Jun 2018**	**0082_MW103D_180609**	**Normal**	**212095**	0.19	0.21	2.5	0.22	7.5	<0.002	0.12	0.25	0.53	0.14	0.13	0.036	<0.002	<0.002	<0.005
MW103D	**27 Nov 2019**	**0082_MW103D_191127**	**Normal**	**EP1912547**	0.26	0.29	2.92	0.22	8.00	<0.02	0.1	0.25	0.62	0.09	0.10	<0.02	<0.02	<0.02	<0.02
MW103D	**23 Jun 2020**	**0082_MW103D_200623**	**Normal**	**EP2006519**	0.31	0.46	2.72	0.16	3.57	<0.02	0.1	0.23	0.76	0.09	0.09	<0.02	<0.02	<0.02	<0.02
MW103D	**23 Jun 2020**	**0082_QC103_200623**	**Field Duplicate**	**EP2006519**	0.22	0.30	2.40	0.14	5.64	<0.02	<0.1	0.13	0.55	0.10	0.11	<0.02	<0.02	<0.02	<0.02
MW103D	**23 Jun 2020**	**0082_QC203_200623**	**Interlab Duplicate**	**728790**	0.14	0.13	1.9	0.17	4.9	<0.01	0.07	0.13	0.37	0.07	0.08	0.01	<0.01	<0.01	<0.01
MW103D	**17 Nov 2020**	**0082_MW103D_201117**	**Normal**	**EP2012738**	0.20	0.22	2.05	0.11	4.03	<0.02	<0.1	0.19	0.50	0.07	0.08	<0.02	<0.02	<0.02	<0.02
MW103D	**21 Jun 2021**	**0082_MW103D_210621**	**Normal**	**EP2107028**	0.27	0.37	2.82	0.13	2.64	<0.02	<0.1	0.21	0.74	0.07	0.08	<0.02	<0.02	<0.02	<0.02
MW103D	**21 Jun 2021**	**0082_QC104_210621**	**Field Duplicate**	**EP2107028**	0.26	0.36	2.76	0.13	2.87	<0.02	<0.1	0.21	0.74	0.07	0.08	<0.02	<0.02	<0.02	<0.02
MW103D	**21 Jun 2021**	**0082_QC204_210621**	**Interlab Duplicate**	**805490**	0.26	0.32	2.7	0.06	2.9	<0.01	0.18	0.18	0.67	0.07	0.06	<0.01	<0.01	<0.01	<0.01
MW103D	**23 Nov 2021**	**0082_MW103D_211123**	**Normal**	**EP2114295**	0.50	0.48	3.25	0.08	3.22	<0.02	0.1	0.29	1.14	0.10	0.10	<0.02	<0.02	<0.02	<0.02
MW103D	**20 Jun 2022**	**0082_MW103D_220620**	**Normal**	**EP2207565**	0.33	0.32	2.50	0.09	2.61	<0.02	0.1	0.24	0.79	0.07	0.08	<0.02	<0.02	<0.02	<0.02
MW103D	**21 Nov 2022**	**0082_MW103D_221121**	**Normal**	**EP2215715**	0.27	0.39	2.89	0.14	3.03	<0.02	0.1	0.31	0.76	0.10	0.09	<0.02	<0.02	<0.02	<0.02
MW103D	**26 Jun 2023**	**0082_MW103D_230626**	**Normal**	**EP2308618**	0.22	0.28	2.35	0.12	2.00	<0.02	0.1	0.21	0.56	0.07	0.06	<0.02	<0.02	<0.02	<0.02
MW105S	**09 Mar 2018**	**0082_MW105S_180309**	**Normal**	**208025**	0.055	0.091	0.97	0.11	6.0	<0.002	0.12	0.24	0.38	0.27	0.18	0.19	<0.002	<0.002	<0.005
MW105S	**04 Jun 2018**	**0082_MW105S_180604**	**Normal**	**211639**	0.057	0.064	0.59	0.031	4.6	<0.002	0.11	0.26	0.34	0.22	0.14	0.14	<0.002	<0.002	<0.005
MW105S	**27 Nov 2019**	**0082_MW105S_191127**	**Normal**	**EP1912547**	0.11	0.15	1.10	0.03	3.92	<0.02	0.1	0.21	0.54	0.16	0.13	0.14	<0.02	<0.02	<0.02
MW105S	**21 Jun 2021**	**0082_MW105S_210621**	**Normal**	**EP2107028**	0.14	0.20	1.66	0.06	6.18	<0.02	0.2	0.50	0.78	0.48	0.33	0.13	<0.02	<0.02	<0.02
MW105S	**23 Nov 2021**	**0082_MW105S_211123**	**Normal**	**EP2114293**	0.16	0.19	1.78	0.05	8.10	<0.02	0.2	0.54	1.19	0.61	0.42	0.25	<0.02	<0.02	<0.02
MW105S	**20 Jun 2022**	**0082_MW105S_220620**	**Normal**	**EP2207565**	0.25	0.32	2.33	0.05	8.26	<0.02	0.4	0.97	1.52	0.82	0.66	0.25	<0.02	<0.02	<0.02
MW105S	**21 Nov 2022**	**0082_MW105S_221121**	**Normal**	**EP2215643**	0.14	0.25	2.66	0.08	5.60	<0.02	0.4	0.61	1.03	0.99	0.76	0.16	<0.02	<0.02	<0.02
MW105S	**26 Jun 2023**	**0082_MW105S_230626**	**Normal**	**EP2308607**	0.05	0.08	0.74	0.03	5.35	<0.02	0.2	0.25	0.38	0.30	0.25	0.16	<0.02	<0.02	<0.02
MW108	**07 Mar 2018**	**0082_MW108_180307**	**Normal**	**208025**	0.009	0.009	0.098	0.002	0.018	<0.002	0.005	0.005	0.011	0.005	0.006	<0.001	<0.002	<0.002	<0.005
MW108	**18 Jun 2018**	**0082_MW108_180618**	**Normal**	**212373**	0.008	0.007	0.083	<0.001	0.033	<0.002	<0.002	<0.002	0.004	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW108	**21 Nov 2022**	**0082_MW108_221121**	**Normal**	**EP2215643**	<0.02	<0.02	0.12	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW108	**26 Jun 2023**	**0082_MW108_230626**	**Normal**	**EP2308607**	<0.02	<0.02	0.14	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW113	**10 Mar 2018**	**0082_MW113_180310**	**Normal**	**208025**	0.026	0.031	0.22	0.011	0.052	<0.002	0.01	0.020	0.035	0.014	0.007	<0.001	<0.002	<0.002	<0.005
MW113	**09 Jun 2018**	**0082_MW113_180609**	**Normal**	**212095**	0.026	0.028	0.22	0.011	0.054	<0.002	0.01	0.021	0.040	0.011	0.006	<0.001	<0.002	<0.002	<0.005
MW113	**27 Nov 2019**	**0082_MW113_191127**	**Normal**	**EP1912547**	0.03	0.03	0.32	<0.02	0.39	<0.02	<0.1	0.02	0.04	<0.02	0.01	<0.02	<0.02	<0.02	<0.02
MW113	**23 Jun 2020**	**0082_MW113_200623**	**Normal**	**EP2006519**	0.03	0.03	0.24	<0.02	0.05	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW113	**17 Nov 2020**	**0082_MW113_201117**	**Normal**	**EP2012738**	0.03	0.02	0.22	<0.02	0.06	<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW113	**17 Nov 2020**	**0082_QC106_201117**	**Field Duplicate**	**EP2012738**	0.03	0.02	0.22	<0.02	0.07	<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW113	**17 Nov 2020**	**0082_QC206_201117**	**Interlab Duplicate**	**758013**	0.02	0.02	0.36	<0.01	0.03	<0.01	<0.05	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW113	**21 Jun 2021**	**0082_MW113_210621**	**Normal**	**EP2107028**	0.02	0.02	0.23	<0.02	0.06	<0.02	<0.1	<0.02	0.03	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW113	**23 Nov 2021**	**0082_MW113_211123**	**Normal**	**EP2114293**	0.03	0.03	0.27	<0.02	0.05	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW113	**23 Nov 2021**	**0082_QC107_211123**	**Field Duplicate**	**EP2114293**	0.04	0.03	0.26	<0.02	0.05	<0.02	<0.1	<0.02	0.04	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW113	**23 Nov 2021**	**0082_QC207_211123**	**Interlab Duplicate**	**844500**	0.03	0.03	0.28	<0.01	0.04	<0.01	<0.05	0.02	0.03	0.01	0.01	<0.01	<0.01	<0.01	<0.01
MW113	**20 Jun 2022**	**0082_MW113_220620**	**Normal**	**EP2207565**	0.03	0.02	0.20	<0.02	0.07	<0.02	<0.1	<0.02	0.03	<0.02	0.01	<0.02	<0.02	<0.02	<0.02
MW113	**21 Nov 2022**	**0082_MW113_221121**	**Normal**	**EP2215715**	0.02	0.02	0.20	<0.02	0.08	<0.02	<0.1	<0.02	0.03	<0.02	0.01	<0.02	<0.02	<0.02	<0.02
MW113	**26 Jun 2023**	**0082_MW113_230626**	**Normal**	**EP2308618**	0.02	<0.02	0.13	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW115	**08 Mar 2018**	**0082_MW115_180308**	**Normal**	**208025**	0.008	0.013	0.082	0.006	0.27	<0.002	0.006	0.006	0.010	0.013	0.12	<0.001	<0.002	<0.002	<0.005
MW115	**09 Jun 2018**	**0082_MW115_180609**	**Normal**	**212095**	0.009	0.020	0.12	0.008	0.046	<0.002	0.020	0.040	0.037	0.022	0.13	<0.001	<0.002	<0.002	<0.005
MW115	**27 Nov 2019**	**0082_MW115_191127**	**Normal**	**EP1912547**	0.15	0.20	3.14	0.16	9.12	<0.02	0.8	2.07	2.36	0.72	0.40	0.02	<0.02	<0.02	<0.02
MW115	**23 Jun 2020**	**0082_MW115_200623**	**Normal**	**EP2006519**	0.26	0.36	4.04	0.22	10.4	<0.02	0.9	2.83	2.92	1.29	0.68	0.03	<0.02	<0.02	<0.02
MW115	**17 Nov 2020**	**0082_MW115_201117**	**Normal**	**EP2012738**	0.17	0.25	3.68	0.20	12.2	<0.02	1.0	2.61	2.11	0.93	0.55	0.03	<0.02	<0.02	<0.02
MW115	**21 Jun 2021**	**0082_MW115_210621**	**Normal**	**EP2107028**	0.17	0.26	3.42	0.21	12.2	<0.02	0.8	2.36	2.36	0.91	0.53	0.03	<0.02	<0.02	<0.02
MW115	**22 Nov 2021**	**0082_MW115_211122**	**Normal**	**EP2114224**	0.33	0.39	5.40	0.29	15.2	<0.02	1.2	3.91	4.60	1.50	0.77	0.05	<0.02	<0.02	<0.02
MW115	**22 Nov 2021**	**0082_QC106_211122**	**Field Duplicate**	**EP2114224**	0.30	0.34	4.73	0.26	14.2	<0.02	1.1	3.57	4.17	1.37	0.68	0.04	<0.02	<0.02	<0.02
MW115	**22 Nov 2021**	**0082_QC206_211122**	**Interlab Duplicate**	**844500**	0.25	0.37	3.8	0.28	15	<0.01	1.2	2.7	2.0	1.1	0.75	0.04	<0.01	<0.01	<0.01
MW115	**20 Jun 2022**	**0082_MW115_220620**	**Normal**	**EP2207565**	0.25	0.31	4.15	0.20	13.2	<0.02	1.1	3.29	2.94	1.19	0.67	0.05	<0.02	<0.02	<0.02
MW115	**21 Nov 2022**	**0082_MW115_221121**	**Normal**	**EP2215715**	0.22	0.41	4.91	0.29	14.6	<0.02	1.4	3.46	3.16	1.49	0.70	0.06	<0.02	<0.02	<0.02
MW115	**26 Jun 2023**	**0082_MW115_230626**	**Normal**	**EP2308618**	0.15	0.23	3.04	0.17	8.66	<0.02	1.0	2.68	2.61	1.48	0.42	0.05	<0.02	<0.02	<0.02
MW118D	**05 Mar 2018**	**0082_MW118D_180305**	**Normal**	**207818**	1.2	1.4	13	0.98	18	<0.002	0.85	2.1	3.7	1.2	1.8	0.11	<0.002	<0.002	<0.005

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids								
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Interim Marine 99%					0.00023						19				
PFAS NEMP 2020 Recreational Water											**10**				
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**											
MW118D	**09 Jun 2018**	**0082_MW118D_180609**	**Normal**	**212095**	0.82	0.73	7.0	1.0	11	<0.02	0.57	1.8	2.5	0.90	1.5	0.17	<0.02	<0.02	<0.05
MW118D	**09 Jun 2018**	**0082_QC156_180609**	**Field Duplicate**	**212095**	1.1	1.0	7.6	1.0	16	<0.02	0.61	1.9	2.6	1.1	1.6	0.19	<0.02	<0.02	<0.05
MW118D	**09 Jun 2018**	**0082_QC256_180609**	**Interlab Duplicate**	**604115**	1.2	0.96	8.3	0.97	27	<0.01	0.62	2.8	3.4	0.94	1.9	0.16	<0.01	<0.01	<0.01
MW118D	**27 Nov 2019**	**0082_MW118D_191127**	**Normal**	**EP1912548**	0.90	1.03	7.00	0.76	16.4	<0.02	0.6	1.46	3.30	0.70	1.23	0.11	<0.02	<0.02	<0.02
MW118D	**23 Jun 2020**	**0082_MW118D_200623**	**Normal**	**EP2006549**	0.82	0.88	7.10	0.60	11.6	<0.02	0.6	1.34	2.50	0.71	1.28	0.10	<0.02	<0.02	<0.02
MW118D	**16 Nov 2020**	**0082_MW118D_201116**	**Normal**	**EP2012669**	0.83	0.78	6.19	0.66	14.3	<0.02	0.3	0.93	1.93	0.54	1.10	0.09	<0.02	<0.02	<0.02
MW118D	**21 Jun 2021**	**0082_MW118D_210621**	**Normal**	**EP2107033**	0.70	0.70	5.53	0.64	12.9	<0.02	0.4	1.29	2.03	0.61	1.24	0.10	<0.02	<0.02	<0.02
MW118D	**22 Nov 2021**	**0082_MW118D_211122**	**Normal**	**EP2114224**	0.66	0.44	3.88	0.43	11.5	<0.02	0.3	1.03	2.02	0.51	1.03	0.11	<0.02	<0.02	<0.02
MW118D	**20 Jun 2022**	**0082_MW118D_220620**	**Normal**	**EP2207563**	0.45	0.35	2.36	0.50	10.2	<0.02	0.3	0.91	1.22	0.42	0.88	0.14	<0.02	<0.02	<0.02
MW118D	**21 Nov 2022**	**0082_MW118D_221121**	**Normal**	**EP2215715**	0.30	0.36	2.08	0.33	10.9	<0.02	0.4	0.87	1.12	0.40	0.70	0.14	<0.02	<0.02	<0.02
MW118D	**26 Jun 2023**	**0082_MW118D_230626**	**Normal**	**EP2308618**	0.32	0.31	1.66	0.27	8.62	<0.02	0.4	0.67	0.93	0.30	0.58	0.14	<0.02	<0.02	<0.02
MW122	**05 Mar 2018**	**0082_MW122_180305**	**Normal**	**207818**	0.21	0.24	2.1	0.04	0.16	0.003	0.2	0.47	0.69	0.22	0.12	0.001	0.003	0.005	<0.005
MW122	**16 Jun 2018**	**0082_MW122_180616**	**Normal**	**212373**	0.24	0.24	2.5	0.094	0.19	<0.002	0.26	0.54	0.89	0.26	0.19	0.002	<0.002	<0.002	<0.005
MW122	**27 Nov 2019**	**0082_MW122_191127**	**Normal**	**EP1912549**	0.28	0.31	2.60	0.05	0.15	<0.02	0.3	0.77	1.02	0.27	0.18	<0.02	<0.02	<0.02	<0.02
MW122	**23 Jun 2020**	**0082_MW122_200623**	**Normal**	**EP2006549**	0.34	0.45	3.15	0.07	0.26	<0.02	0.3	0.87	1.25	0.42	0.29	<0.02	<0.02	<0.02	<0.02
MW122	**16 Nov 2020**	**0082_MW122_201116**	**Normal**	**EP2012669**	0.15	0.18	1.53	0.05	0.25	<0.02	0.1	0.33	0.55	0.21	0.16	<0.02	<0.02	<0.02	<0.02
MW122	**22 Jun 2021**	**0082_MW122_210622**	**Normal**	**EP2107092**	0.15	0.15	1.34	0.04	0.32	<0.02	0.1	0.34	0.44	0.17	0.12	<0.02	<0.02	<0.02	<0.02
MW122	**23 Nov 2021**	**0082_MW122_211123**	**Normal**	**EP2114295**	0.29	0.27	2.80	0.05	0.39	<0.02	0.2	0.68	1.06	0.37	0.28	<0.02	<0.02	<0.02	<0.02
MW122	**20 Jun 2022**	**0082_MW122_220620**	**Normal**	**EP2207565**	0.24	0.22	1.97	0.05	0.30	<0.02	0.2	0.58	0.80	0.25	0.21	<0.02	<0.02	<0.02	<0.02
MW122	**26 Jun 2023**	**0082_MW122_230626**	**Normal**	**EP2308607**	0.12	0.15	0.85	0.02	0.24	<0.02	0.1	0.23	0.27	0.08	0.06	<0.02	<0.02	<0.02	<0.02
MW126	**05 Mar 2018**	**0082_MW126_180305**	**Normal**	**207818**	0.011	0.011	0.11	0.006	0.26	<0.002	0.12	0.28	0.29	0.13	0.06	0.033	0.003	<0.002	<0.005
MW126	**16 Jun 2018**	**0082_MW126_180616**	**Normal**	**212373**	0.006	0.004	0.059	0.004	0.25	<0.002	0.06	0.16	0.14	0.1	0.05	0.034	<0.002	<0.002	<0.005
MW126	**27 Nov 2019**	**0082_MW126_191127**	**Normal**	**EP1912546**	0.08	0.09	0.69	0.04	1.06	<0.02	<0.1	0.32	0.34	0.19	0.11	0.04	<0.02	<0.02	<0.02
MW126	**23 Jun 2020**	**0082_MW126_200623**	**Normal**	**EP2006549**	0.08	0.11	0.62	0.03	1.04	<0.02	<0.1	0.29	0.35	0.21	0.13	0.04	<0.02	<0.02	<0.02
MW126	**21 Jun 2021**	**0082_MW126_210621**	**Normal**	**EP2107033**	0.06	0.07	0.65	0.04	2.25	<0.02	0.2	0.50	0.50	0.24	0.16	0.06	<0.02	<0.02	<0.02
MW126	**22 Nov 2021**	**0082_MW126_211122**	**Normal**	**EP2114226**	0.03	<0.02	0.21	<0.02	0.76	<0.02	0.2	0.73	0.89	0.18	0.07	0.02	<0.02	<0.02	<0.02
MW126	**20 Jun 2022**	**0082_MW126_220620**	**Normal**	**EP2207564**	0.14	0.13	1.17	0.06	2.45	<0.02	0.2	0.60	0.65	0.31	0.20	0.08	<0.02	<0.02	<0.02
MW126	**21 Nov 2022**	**0082_MW126_221121**	**Normal**	**EP2215715**	<0.02	<0.02	0.18	<0.02	0.34	<0.02	0.3	0.90	0.82	0.23	0.08	0.02	<0.02	<0.02	<0.02
MW126	**26 Jun 2023**	**0082_MW126_230626**	**Normal**	**EP2308607**	<0.02	<0.02	0.14	<0.02	0.30	<0.02	0.4	1.00	0.94	0.27	0.10	0.02	<0.02	<0.02	<0.02
MW128	**05 Mar 2018**	**0082_MW128_4.2_180305**	**Normal**	**207818**	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	0.009	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW128	**05 Mar 2018**	**0082_MW128_6.2_180305**	**Normal**	**207818**	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	0.02	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW128	**05 Mar 2018**	**0082_MW128_8.2_180305**	**Normal**	**207818**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	0.04	<0.002	<0.01	<0.001	0.001	<0.001	<0.002	<0.002	<0.005
MW128	**15 Jun 2018**	**0082_MW128_3.7-4.2_180615**	**Normal**	**212373**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW128	**15 Jun 2018**	**0082_MW128_5.7-6.2_180615**	**Normal**	**212373**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.01
MW128	**15 Jun 2018**	**0082_MW128_7.7-8.2_180615**	**Normal**	**212373**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW128	**27 Nov 2019**	**0082_MW128_3.7-4.2_191127**	**Normal**	**EP1912546**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW128	**23 Jun 2020**	**0082_MW128_200623**	**Normal**	**EP2006518**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW128	**16 Nov 2020**	**0082_MW128_201116**	**Normal**	**EP2012670**	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
MW128	**21 Jun 2021**	**0082_MW128_3.7-4.2_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW128	**22 Nov 2021**	**0082_MW128_3.7-4.2_211122**	**Normal**	**EP2114224**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW128	**20 Jun 2022**	**0082_MW128_220620**	**Normal**	**EP2207565**	0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW128	**20 Nov 2022**	**0082_MW128_3.7-4.2_221120**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW128	**26 Jun 2023**	**0082_MW128_3.7-4.2_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW129	**05 Mar 2018**	**0082_MW129_3.5-4.0_180305**	**Normal**	**207818**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	<0.001	<0.001	<0.002	<0.002	<0.005
MW129	**05 Mar 2018**	**0082_MW129_5.5-6.0_180305**	**Normal**	**207818**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	0.005	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	0.002	<0.005
MW129	**05 Mar 2018**	**0082_MW129_7.5-8.0_180305**	**Normal**	**207818**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	<0.001	<0.001	<0.002	<0.002	<0.005
MW129	**21 Jun 2018**	**0082_MW129_3.5-4.0_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW129	**21 Jun 2018**	**0082_MW129_5.5-6.0_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW129	**21 Jun 2018**	**0082_MW129_7.5-8.0_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW129	**27 Nov 2019**	**0082_MW129_3.5-4.0_191127**	**Normal**	**EP1912546**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW129	**23 Jun 2020**	**0082_MW129_200623**	**Normal**	**EP2006518**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW129	**16 Nov 2020**	**0082_MW129_201116**	**Normal**	**EP2012737**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW129	**21 Jun 2021**	**0082_MW129_3.5-4.0_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW129	**22 Nov 2021**	**0082_MW129_3.5-4_211122**	**Normal**	**EP2114226**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW129	**20 Jun 2022**	**0082_MW129_3.5-4_220620**	**Normal**	**EP2207564**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW129	**20 Jun 2022**	**0082_QC106_220620**	**Field Duplicate**	**EP2207564**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW129	**20 Jun 2022**	**0082_QC206_220620**	**Interlab Duplicate**	**901186**	<0.002	<0.002	0.003	<0.002	0.064	<0.004	<0.008	<0.002	0.001	0.009	<0.001	<0.002	<0.001	<0.001	<0.001
MW129	**20 Nov 2022**	**0082_MW129_3.5-4.0_221120**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW129	**26 Jun 2023**	**0082_MW129_3.5-4.0_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW130	**05 Mar 2018**	**0082_MW130_2.8-3.3_180305**	**Normal**	**207818**	<0.001	<0.001	0.002	<0.001	0.011	<0.002	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.05
MW130	**05 Mar 2018**	**0082_MW130_4.8-5.3_180305**	**Normal**	**207818**	<0.001	<0.001	0.004	<0.001	0.048	<0.002	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.05
MW130	**05 Mar 2018**	**0082_MW130_6.8-7.3_180305**	**Normal**	**207818**	<0.001	<0.001	0.002	<0.001	0.003	<0.002	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.05
MW130	**20 Jun 2018**	**0082_MW130_4.8-5.3_180620**	**Normal**	**212780**	0.002	0.003	0.072	0.008	0.16	<0.002	0.003	<0.002	0.004	<0.001	0.002	<0.001	<0.002	<0.002	<0.005
MW130	**20 Jun 2018**	**0082_MW130_6.8-7.3_180620**	**Normal**	**212780**	<0.001	<0.001	0.003	<0.001	0.004	<0.002	0.002	<0.002	0.003	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW130	**20 Jun 2018**	**0082_QC272_180620**	**Interlab Duplicate**	**605980**	<0.01	<0.01	0.06	<0.01	0.32	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids								
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Interim Marine 99%					0.00023						19				
PFAS NEMP 2020 Recreational Water											**10**				

Location Code	Date	Field ID	Sample Type	Lab Report Number															
MW130	23 Jun 2018	0082_MW130_2.8-3.3_180623	Normal	212780	<0.001	<0.001	0.001	<0.001	0.004	<0.002	0.002	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW130	23 Jun 2020	0082_MW130_200623	Normal	EP2006518	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW130	16 Nov 2020	0082_MW130_201116	Normal	EP2012737	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW130	21 Jun 2021	0082_MW130_6.9-7.4_210621	Normal	EP2107024	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW130	22 Nov 2021	0082_MW130_211122	Normal	EP2114226	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW130	20 Jun 2022	0082_MW130_2.9-3.4_220620	Normal	EP2207564	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW130	20 Nov 2022	0082_MW130_2.9-3.4_221120	Normal	EP2215643	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW130	26 Jun 2023	0082_MW130_4.9-5.4_230626	Normal	EP2308608	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW131	10 Mar 2018	0082_MW131_2.0-2.5_180310	Normal	208025	0.001	<0.001	<0.001	<0.001	0.004	<0.002	0.004	<0.002	0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW131	10 Mar 2018	0082_MW131_4.0-4.5_180310	Normal	208025	<0.050	<0.050	<0.050	<0.050	<0.050	<0.10	<0.10	<0.10	<0.050	<0.050	<0.050	<0.050	<0.10	<0.10	<0.20
MW131	10 Mar 2018	0082_MW131_6.0-6.5_180310	Normal	208025	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW131	10 Mar 2018	0082_MW131_8.0-8.5_180310	Normal	208025	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW131	20 Jun 2018	0082_MW131_2.0-2.5_180620	Normal	212570	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW131	20 Jun 2018	0082_MW131_4.0-4.5_180620	Normal	212570	0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW131	20 Jun 2018	0082_MW131_6.0-6.5_180620	Normal	212570	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
MW131	20 Jun 2018	0082_MW131_8.0-8.5_180620	Normal	212570	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW131	28 Nov 2019	0082_MW131_4.0-4.5_191128	Normal	EP1912609	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW131	23 Jun 2020	0082_MW131_200623	Normal	EP2006518	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW131	16 Nov 2020	0082_MW131_201116	Normal	EP2012737	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW131	21 Jun 2021	0082_MW131_4.0-4.5_210621	Normal	EP2107024	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW131	22 Nov 2021	0082_MW131_211122	Normal	EP2114226	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW131	20 Jun 2022	0082_MW131_2-2.5_220620	Normal	EP2207564	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW131	20 Nov 2022	0082_MW131_4.0-4.5_221120	Normal	EP2215643	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW131	26 Jun 2023	0082_MW131_4.0-4.5_230626	Normal	EP2308607	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW132	10 Mar 2018	0082_MW132_6.4-6.9_180310	Normal	208025	0.015	<0.01	0.015	<0.01	<0.01	<0.01	0.01	<0.02	0.034	<0.01	0.025	<0.01	<0.01	<0.01	<0.02
MW132	10 Mar 2018	0082_MW132_8.5-9.0_180310	Normal	208025	0.003	<0.001	<0.001	<0.001	0.004	<0.002	0.01	<0.002	0.029	0.004	0.014	0.005	0.009	<0.002	<0.005
MW132	21 Jun 2018	0082_MW132_6.4-6.9_180621	Normal	212780	0.018	0.017	0.032	0.001	0.002	<0.002	0.007	0.003	0.017	0.003	0.008	<0.001	<0.002	<0.002	<0.005
MW132	21 Jun 2018	0082_MW132_8.5-9.0_180621	Normal	212780	0.002	0.002	0.004	<0.001	<0.001	<0.002	<0.002	<0.002	0.003	<0.001	0.002	<0.001	<0.002	<0.002	<0.005
MW132	27 Nov 2019	0082_MW132_6.4-6.9_191127	Normal	EP1912546	0.02	<0.02	0.05	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW132	23 Jun 2020	0082_MW132_200623	Normal	EP2006549	<0.02	0.02	0.05	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW132	16 Nov 2020	0082_MW132_201116	Normal	EP2012670	<0.02	<0.02	0.04	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW132	21 Jun 2021	0082_MW132_8.5-9.0_210621	Normal	EP2107024	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW132	22 Nov 2021	0082_MW132_6.4-6.9_211122	Normal	EP2114224	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW132	20 Jun 2022	0082_MW132_6.4-6.9_220620	Normal	EP2207564	0.04	0.03	0.19	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW132	21 Nov 2022	0082_MW132_6.4-6.9_221121	Normal	EP2215643	0.04	<0.02	0.17	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW132	26 Jun 2023	0082_MW132_6.4-6.9_230626	Normal	EP2308608	0.03	0.03	0.12	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW133	10 Mar 2018	0082_MW133_3.0-3.5_180310	Normal	208025	0.002	<0.001	0.009	<0.001	0.029	<0.002	0.008	<0.002	0.003	<0.001	0.006	0.001	<0.002	<0.002	<0.005
MW133	10 Mar 2018	0082_MW133_5.0-5.5_180310	Normal	208025	0.002	<0.001	0.012	<0.001	0.030	<0.002	0.01	<0.002	<0.001	<0.001	0.004	0.002	<0.002	<0.002	<0.005
MW133	10 Mar 2018	0082_MW133_7.0-7.5_180310	Normal	208025	0.002	0.002	0.011	<0.001	0.020	<0.002	0.005	<0.002	<0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.005
MW133	10 Mar 2018	0082_QC1405_180310	Field Duplicate	208025	<0.01	<0.01	0.014	<0.01	0.024	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
MW133	21 Jun 2018	0082_MW133_3.0-3.5_180621	Normal	212780	0.001	0.001	0.010	0.004	0.020	<0.002	0.007	<0.002	0.002	<0.001	0.002	<0.001	<0.002	<0.002	<0.005
MW133	21 Jun 2018	0082_MW133_5.0-5.5_180621	Normal	212780	0.002	0.002	0.014	0.020	0.020	<0.002	0.009	<0.002	0.001	<0.001	0.004	<0.001	<0.002	<0.002	<0.005
MW133	21 Jun 2018	0082_MW133_7.0-7.5_180621	Normal	212780	0.002	0.002	0.014	0.012	0.008	<0.002	0.006	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW133	27 Nov 2019	0082_MW133_3.0-3.5_191127	Normal	EP1912548	<0.02	<0.02	0.04	<0.02	0.12	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW133	23 Jun 2020	0082_MW133_200623	Normal	EP2006549	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW133	16 Nov 2020	0082_MW133_201116	Normal	EP2012737	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW133	21 Jun 2021	0082_MW133_3.0-3.5_210621	Normal	EP2107024	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW133	22 Nov 2021	0082_MW133_3-3.5_211122	Normal	EP2114224	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW133	20 Jun 2022	0082_MW133_220620	Normal	EP2207564	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW133	21 Nov 2022	0082_MW133_3-3.5_221121	Normal	EP2215643	<0.02	<0.02	<0.01	<0.02	0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW133	26 Jun 2023	0082_MW133_3.0-3.5_230626	Normal	EP2308618	<0.02	<0.02	<0.01	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW134	09 Mar 2018	0082_MW134_6.6-7.1_180309	Normal	208025	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
MW134	09 Mar 2018	0082_MW134_8.6-9.1_180309	Normal	208025	<0.001	<0.001	<0.01	<0.001	0.003	<0.002	0.007	<0.002	<0.01	<0.001	0.001	<0.001	<0.002	<0.002	<0.005
MW134	22 Jun 2018	0082_MW134_6.6-7.1_180622	Normal	212780	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW134	22 Jun 2018	0082_MW134_8.6-9.1_180622	Normal	212780	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW134	27 Nov 2019	0082_MW134D_191127	Normal	EP1912549	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW134	23 Jun 2020	0082_MW134_6.6_200623	Normal	EP2006519	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW134	17 Nov 2020	0082_MW134_201117	Normal	EP2012748	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW134	17 Nov 2020	0082_QC105_201117	Field Duplicate	EP2012748	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW134	17 Nov 2020	0082_QC205_201117	Interlab Duplicate	758013	<0.01	0.01	0.14	<0.01	0.03	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW134	21 Jun 2021	0082_MW134_210621	Normal	EP2107033	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW134	22 Nov 2021	0082_MW134_211122	Normal	EP2114227	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW134	20 Jun 2022	0082_MW134_6.6-7.1_220620	Normal	EP2207563	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW134	21 Nov 2022	0082_MW134_6.6-7.1_221121	Normal	EP2215643	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW134	26 Jun 2023	0082_MW134_6.6-7.1_230626	Normal	EP2308608	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids								
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Interim Marine 99%					0.00023						19				
PFAS NEMP 2020 Recreational Water											**10**				
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**											
MW135	**09 Mar 2018**	**0082_MW135_8.3-8.8_180309**	**Normal**	**208025**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.05
MW135	**09 Mar 2018**	**0082_MW135_10.3-10.8_180309**	**Normal**	**208025**	<0.001	<0.001	0.002	<0.001	0.005	<0.002	<0.002	<0.002	<0.001	<0.001	0.001	<0.001	<0.002	<0.002	<0.005
MW135	**22 Jun 2018**	**0082_MW135_8.3-8.8_180622**	**Normal**	**212780**	<0.001	<0.001	0.001	<0.001	0.007	<0.002	0.005	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW135	**22 Jun 2018**	**0082_MW135_10.3-10.8_180622**	**Normal**	**212780**	<0.001	<0.001	0.004	<0.001	0.012	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW135	**27 Nov 2019**	**0082_MW135_191127**	**Normal**	**EP1912547**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW135	**17 Nov 2020**	**0082_MW135_201117**	**Normal**	**EP2012748**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW135	**21 Jun 2021**	**0082_MW135_210621**	**Normal**	**EP2107028**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW135	**23 Nov 2021**	**0082_MW135_8.3-8.8_211123**	**Normal**	**EP2114294**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW135	**20 Jun 2022**	**0082_MW135_10.3-10.8_220620**	**Normal**	**EP2207563**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW135	**21 Nov 2022**	**0082_MW135_10.3-10.8_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW135	**26 Jun 2023**	**0082_MW135_10.3-10.8_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW137	**09 Mar 2018**	**0082_MW137_6.1-6.6_180309**	**Normal**	**208025**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
MW137	**09 Mar 2018**	**0082_MW137_8.1-8.6_180309**	**Normal**	**208025**	<0.01	<0.01	<0.010	<0.010	0.015	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
MW137	**09 Mar 2018**	**0082_MW137_10.1-10.6_180309**	**Normal**	**208025**	<0.001	<0.001	0.004	<0.001	0.013	<0.002	0.003	<0.002	0.002	<0.001	0.001	<0.001	<0.002	<0.002	<0.005
MW137	**21 Jun 2018**	**0082_QC276_180622**	**Interlab Duplicate**	**605977**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW137	**22 Jun 2018**	**0082_MW137_6.0-6.6_180622**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW137	**22 Jun 2018**	**0082_MW137_8.1-8.6_180622**	**Normal**	**212780**	<0.001	<0.001	0.001	<0.001	0.007	<0.002	0.003	<0.002	0.002	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW137	**22 Jun 2018**	**0082_MW137_10.1-10.6_180622**	**Normal**	**212780**	<0.001	<0.001	0.001	<0.001	0.005	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW137	**22 Jun 2018**	**0082_QC176_180622**	**Field Duplicate**	**212780**	<0.001	<0.001	0.002	<0.001	0.007	<0.002	0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW137	**27 Nov 2019**	**0082_MW137_6.1-6.6_191127**	**Normal**	**EP1912548**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW137	**23 Jun 2020**	**0082_MW137_200623**	**Normal**	**EP2006549**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW137	**16 Nov 2020**	**0082_MW137_6.6_201116**	**Normal**	**EP2012669**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW137	**21 Jun 2021**	**0082_MW137_8.1-8.6_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW137	**22 Nov 2021**	**0082_MW137_211122**	**Normal**	**EP2114226**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW137	**20 Jun 2022**	**0082_MW137_220620**	**Normal**	**EP2207565**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW137	**21 Nov 2022**	**0082_MW137_6.1-6.6_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW137	**26 Jun 2023**	**0082_MW137_6.1-6.6_230626**	**Normal**	**EP2308618**	<0.02	<0.02	0.01	<0.02	0.06	<0.02	<0.1	0.06	0.06	0.03	<0.01	<0.02	<0.02	<0.02	<0.02
MW142	**22 Jun 2018**	**0082_MW142_180622**	**Normal**	**212780**	0.042	0.090	1.5	0.20	6.8	<0.02	0.24	0.62	0.77	0.43	0.59	0.068	<0.02	<0.02	<0.05
MW142	**27 Nov 2019**	**0082_MW142_191127**	**Normal**	**EP1912547**	0.04	0.06	1.08	0.10	4.56	<0.02	0.1	0.41	0.63	0.22	0.28	0.02	<0.02	<0.02	<0.02
MW142	**23 Jun 2020**	**0082_MW142_200623**	**Normal**	**EP2006519**	0.08	0.11	1.01	0.13	6.14	<0.02	0.2	0.55	0.65	0.27	0.27	0.03	<0.02	<0.02	<0.02
MW142	**17 Nov 2020**	**0082_MW142_201117**	**Normal**	**EP2012739**	0.03	0.05	0.74	0.06	5.92	<0.02	0.1	0.29	0.33	0.12	0.14	<0.02	<0.02	<0.02	<0.02
MW142	**21 Jun 2021**	**0082_MW142_210621**	**Normal**	**EP2107028**	0.42	0.46	3.27	1.07	48.6	<0.02	1.7	4.47	3.47	1.28	0.74	0.16	<0.02	<0.02	<0.02
MW142	**21 Jun 2021**	**0082_QC103_210621**	**Field Duplicate**	**EP2107028**	0.24	0.27	2.00	0.48	27.3	<0.02	1.0	2.36	1.99	0.76	0.46	0.09	<0.02	<0.02	<0.02
MW142	**21 Jun 2021**	**0082_QC203_210621**	**Interlab Duplicate**	**805490**	0.46	0.51	3.6	0.63	60	<0.01	2.2	4.6	4.1	1.6	0.78	0.15	<0.01	<0.01	<0.01
MW142	**22 Nov 2021**	**0082_MW142_211122**	**Normal**	**EP2114224**	0.06	0.05	0.58	0.08	8.98	<0.02	0.1	0.37	0.46	0.14	0.12	<0.02	<0.02	<0.02	<0.02
MW142	**22 Nov 2021**	**0082_QC104_211122**	**Field Duplicate**	**EP2114224**	0.06	0.05	0.58	0.08	8.00	<0.02	0.1	0.37	0.48	0.14	0.11	<0.02	<0.02	<0.02	<0.02
MW142	**22 Nov 2021**	**0082_QC204_211122**	**Interlab Duplicate**	**844500**	0.05	0.07	0.61	0.11	6.2	<0.01	0.19	0.37	0.34	0.14	0.12	0.02	<0.01	<0.01	<0.01
MW142	**20 Jun 2022**	**0082_MW142_220620**	**Normal**	**EP2207565**	0.63	0.29	3.10	0.56	63.4	<0.02	2.1	4.59	3.34	1.27	0.97	0.24	<0.02	<0.02	<0.02
MW142	**20 Jun 2022**	**0082_QC104_220620**	**Field Duplicate**	**EP2207565**	0.64	0.31	3.33	0.61	66.9	<0.02	2.2	4.82	3.36	1.39	0.95	0.22	<0.02	<0.02	<0.02
MW142	**20 Jun 2022**	**0082_QC204_220620**	**Interlab Duplicate**	**901186**	0.12	0.048	0.58	0.088	4.7	<0.004	0.11	1.1	0.76	0.31	0.23	0.043	<0.001	<0.001	<0.001
MW142	**21 Nov 2022**	**0082_MW142_221121**	**Normal**	**EP2215715**	0.16	0.14	1.34	0.27	21.5	<0.02	0.7	1.36	1.07	0.47	0.36	0.09	<0.02	<0.02	<0.02
MW142	**26 Jun 2023**	**0082_MW142_230626**	**Normal**	**EP2308618**	0.07	0.07	0.79	0.13	8.04	<0.02	0.2	0.52	0.49	0.22	0.22	0.06	<0.02	<0.02	<0.02
MW142	**26 Jun 2023**	**0082_QC103_230626**	**Field Duplicate**	**EP2308618**	0.06	0.06	0.78	0.14	10.7	<0.02	0.2	0.54	0.52	0.24	0.21	0.06	<0.02	<0.02	<0.02
MW142	**26 Jun 2023**	**0082_QC203_230626**	**Interlab Duplicate**	**1004374**	0.04	0.06	0.59	0.16	12	<0.01	0.19	0.45	0.42	0.19	0.18	0.05	<0.01	<0.01	<0.01
MW143	**23 Jun 2018**	**0082_MW143_180623**	**Normal**	**212780**	0.042	0.10	0.73	0.11	4.1	<0.02	0.44	1.1	1.1	0.79	0.48	0.017	<0.02	<0.02	<0.05
MW143	**27 Nov 2019**	**0082_MW143_191127**	**Normal**	**EP1912547**	<0.02	0.04	0.55	0.12	8.93	<0.02	0.4	0.96	1.18	0.69	0.47	<0.02	<0.02	<0.02	<0.02
MW143	**27 Nov 2019**	**0082_QC102_191127**	**Field Duplicate**	**EP1912547**	0.02	0.04	0.60	0.15	8.38	<0.02	0.5	1.22	1.16	0.76	0.57	0.02	<0.02	<0.02	<0.02
MW143	**27 Nov 2019**	**0082_QC202_191127**	**Interlab Duplicate**	**691496**	0.02	0.04	0.46	0.13	7.2	<0.01	0.42	0.95	0.97	0.74	0.58	0.02	<0.01	<0.01	<0.01
MW143	**23 Jun 2020**	**0082_MW143_200623**	**Normal**	**EP2006519**	0.06	0.08	0.66	0.10	4.69	<0.02	0.4	1.09	1.12	0.69	0.39	<0.02	<0.02	<0.02	<0.02
MW143	**17 Nov 2020**	**0082_MW143_201117**	**Normal**	**EP2012739**	0.04	0.05	0.53	0.11	4.81	<0.02	0.4	1.03	0.92	0.57	0.37	<0.02	<0.02	<0.02	<0.02
MW143	**21 Jun 2021**	**0082_MW143_210621**	**Normal**	**EP2107028**	0.06	0.06	0.66	0.08	2.70	<0.02	0.3	0.95	0.95	0.46	0.30	<0.02	<0.02	<0.02	<0.02
MW143	**23 Nov 2021**	**0082_MW143_211123**	**Normal**	**EP2114293**	0.08	0.05	0.54	0.08	5.10	<0.02	0.4	1.01	1.19	0.66	0.48	<0.02	<0.02	<0.02	<0.02
MW143	**20 Jun 2022**	**0082_MW143_220620**	**Normal**	**EP2207565**	0.06	0.05	0.42	0.06	4.60	<0.02	0.3	0.80	0.78	0.46	0.36	<0.02	<0.02	<0.02	<0.02
MW143	**21 Nov 2022**	**0082_MW143_221121**	**Normal**	**EP2215715**	0.02	0.04	0.45	0.10	6.73	<0.02	0.6	1.14	1.06	0.88	0.76	0.04	<0.02	<0.02	<0.02
MW143	**26 Jun 2023**	**0082_MW143_230626**	**Normal**	**EP2308618**	0.03	0.04	0.40	0.09	4.70	<0.02	0.4	0.98	0.88	0.71	0.52	0.02	<0.02	<0.02	<0.02
MW144S	**23 Jun 2018**	**0082_MW144S_180623**	**Normal**	**212780**	0.26	0.29	1.9	0.11	4.0	<0.02	0.68	1.9	1.9	1.4	0.60	0.19	0.005	<0.02	<0.05
MW144S	**28 Nov 2019**	**0082_MW144_S_191128**	**Normal**	**EP1912606**	0.24	0.29	2.47	0.13	9.86	<0.02	0.8	2.14	1.99	1.55	0.66	0.28	<0.02	<0.02	<0.02
MW144S	**25 Jun 2020**	**0082_MW144S_200625**	**Normal**	**EP2006593**	0.22	0.31	1.92	0.09	6.06	<0.02	0.5	1.47	1.61	1.41	0.55	0.23	<0.02	<0.02	<0.02
MW144S	**17 Nov 2020**	**0082_MW144_S_201117**	**Normal**	**EP2012739**	0.20	0.28	2.09	0.09	5.97	<0.02	0.6	1.43	1.46	1.48	0.58	0.24	<0.02	<0.02	<0.02
MW144S	**17 Nov 2020**	**0082_QC103_201117**	**Field Duplicate**	**EP2012739**	0.20	0.29	2.10	0.10	6.88	<0.02	0.6	1.46	1.44	1.46	0.59	0.26	<0.02	<0.02	<0.02
MW144S	**17 Nov 2020**	**0082_QC204_201117**	**Interlab Duplicate**	**758013**	0.18	0.23	5.0	0.09	5.9	<0.01	0.63	1.4	1.4	1.4	0.43	0.21	<0.01	<0.01	<0.01
MW144S	**21 Jun 2021**	**0082_MW144S_210621**	**Normal**	**EP2107033**	0.27	0.36	2.89	0.17	8.36	<0.02	0.7	2.44	2.22	2.08	0.95	0.35	<0.02	<0.02	<0.02
MW144S	**22 Nov 2021**	**0082_MW144S_211122**	**Normal**	**EP2114224**	0.29	0.28	2.86	0.13	10.4	<0.02	0.8	2.39	2.96	2.21	0.96	0.34	<0.02	<0.02	<0.02
MW144S	**20 Jun 2022**	**0082_MW144S_220620**	**Normal**	**EP2207565**	0.24	0.28	2.33	0.10	7.66	<0.02	0.6	1.96	1.90	1.45	0.74	0.38	<0.02	<0.02	<0.02
MW144S	**21 Nov 2022**	**0082_MW144S_221121**	**Normal**	**EP2215643**	0.21	0.31	2.80	0.18	9.95	<0.02	0.9	2.32	2.22	1.89	0.96	0.32	<0.02	<0.02	<0.02

					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids								
					Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Interim Marine 99%									0.00023						19				
PFAS NEMP 2020 Recreational Water															**10**				
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**															
MW144S	**21 Nov 2022**	**0082_QC106_221121**	**Field Duplicate**	**EP2215643**	0.19	0.30	2.67	0.17	9.69	<0.02	0.9	2.26	2.11	1.82	0.92	0.31	<0.02	<0.02	<0.02
MW144S	**21 Nov 2022**	**0082_QC206_221120**	**Interlab Duplicate**	**945158**	0.19	0.24	2.7	0.15	13	<0.01	0.80	2.0	1.8	1.6	0.84	0.23	<0.01	<0.01	<0.01
MW144S	**26 Jun 2023**	**0082_MW144S_230626**	**Normal**	**EP2308607**	0.33	0.42	2.77	0.13	6.90	<0.02	0.8	1.87	1.70	1.70	0.88	0.25	<0.02	<0.02	<0.02
MW145	**20 Jun 2018**	**0082_MW145_180620**	**Normal**	**212570**	0.41	0.61	2.4	0.051	0.19	<0.002	0.13	0.38	1.9	0.17	0.12	0.001	<0.002	<0.002	<0.005
MW145	**27 Nov 2019**	**0082_MW145_191127**	**Normal**	**EP1912549**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW145	**25 Jun 2020**	**0082_MW145_200625**	**Normal**	**EP2006593**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW145	**25 Jun 2020**	**0082_QC101_200625**	**Field Duplicate**	**EP2006593**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW145	**25 Jun 2020**	**0082_QC201_200625**	**Interlab Duplicate**	**729348**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW145	**17 Nov 2020**	**0082_MW145_201117**	**Normal**	**EP2012738**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW145	**21 Jun 2021**	**0082_MW145_210621**	**Normal**	**EP2107028**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW145	**21 Jun 2021**	**0082_QC106_210621**	**Field Duplicate**	**EP2107028**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW145	**21 Jun 2021**	**0082_QC206_210621**	**Interlab Duplicate**	**805490**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW145	**22 Nov 2021**	**0082_MW145_211122**	**Normal**	**EP2114227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW145	**20 Jun 2022**	**0082_MW145_220620**	**Normal**	**EP2207563**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW145	**21 Nov 2022**	**0082_MW145_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW145	**21 Nov 2022**	**0082_QC104_221121**	**Field Duplicate**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW145	**21 Nov 2022**	**0082_QC204_221120**	**Interlab Duplicate**	**945158**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW145	**26 Jun 2023**	**0082_MW145_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW147	**21 Jun 2018**	**0082_MW147_180621**	**Normal**	**212780**	<0.001	0.001	0.007	<0.001	0.008	<0.002	<0.002	<0.002	0.004	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW147	**27 Nov 2019**	**0082_MW147_191127**	**Normal**	**EP1912549**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW147	**17 Nov 2020**	**0082_MW147_201117**	**Normal**	**EP2012748**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW147	**22 Jun 2021**	**0082_MW147_210622**	**Normal**	**EP2107183**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW147	**22 Jun 2021**	**0082_QC107_210622**	**Field Duplicate**	**EP2107183**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW147	**22 Jun 2021**	**0082_QC207_210622**	**Interlab Duplicate**	**805490**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW147	**22 Nov 2021**	**0082_MW147_211122**	**Normal**	**EP2114227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW147	**20 Jun 2022**	**0082_MW147_220620**	**Normal**	**EP2207563**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW147	**21 Nov 2022**	**0082_MW147_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW147	**26 Jun 2023**	**0082_MW147_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW147	**26 Jun 2023**	**0082_QC101_230626**	**Field Duplicate**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW147	**26 Jun 2023**	**0082_QC201_230626**	**Interlab Duplicate**	**1004374**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW148S	**21 Jun 2018**	**0082_MW148S_180621**	**Normal**	**212780**	<0.001	<0.001	0.002	<0.001	0.006	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW148S	**27 Nov 2019**	**0082_MW148S_191127**	**Normal**	**EP1912549**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW148S	**27 Nov 2019**	**0082_QC101_191127**	**Field Duplicate**	**EP1912549**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW148S	**27 Nov 2019**	**0082_QC201_191127**	**Interlab Duplicate**	**691496**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW148S	**23 Jun 2020**	**0082_MW148S_200623**	**Normal**	**EP2006519**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW148S	**23 Jun 2020**	**0082_QC104_200623**	**Field Duplicate**	**EP2006519**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW148S	**23 Jun 2020**	**0082_QC204_200623**	**Interlab Duplicate**	**728790**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW148S	**17 Nov 2020**	**0082_MW148S_201117**	**Normal**	**EP2012748**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW148S	**21 Jun 2021**	**0082_MW148S_210621**	**Normal**	**EP2107033**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW148S	**22 Nov 2021**	**0082_MW148S_211122**	**Normal**	**EP2114227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW148S	**20 Jun 2022**	**0082_MW148S_220620**	**Normal**	**EP2207563**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW148S	**21 Nov 2022**	**0082_MW148S_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW148S	**26 Jun 2023**	**0082_MW148S_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW151S	**21 Jun 2018**	**0082_MW151S_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW151S	**27 Nov 2019**	**0082_MW151S_191127**	**Normal**	**EP1912546**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW151S	**23 Jun 2020**	**0082_MW151S_200623**	**Normal**	**EP2006518**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW151S	**16 Nov 2020**	**0082_MW151_S_201116**	**Normal**	**EP2012737**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW151S	**21 Jun 2021**	**0082_MW151S_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW151S	**22 Nov 2021**	**0082_MW151S_211122**	**Normal**	**EP2114227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW151S	**20 Jun 2022**	**0082_MW151S_220620**	**Normal**	**EP2207564**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW151S	**21 Nov 2022**	**0082_MW151S_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW151S	**26 Jun 2023**	**0082_MW151S_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW152S	**21 Jun 2018**	**0082_MW152S_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	0.003	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW152S	**27 Nov 2019**	**0082_MW152S_191127**	**Normal**	**EP1912546**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW152S	**27 Nov 2019**	**0082_QC105_191127**	**Field Duplicate**	**EP1912546**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW152S	**27 Nov 2019**	**0082_QC205_191127**	**Interlab Duplicate**	**691496**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW152S	**23 Jun 2020**	**0082_MW152S_200623**	**Normal**	**EP2006518**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW152S	**16 Nov 2020**	**0082_MW152S_201116**	**Normal**	**EP2012669**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW152S	**22 Jun 2021**	**0082_MW152S_210622**	**Normal**	**EP2107092**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW152S	**22 Nov 2021**	**0082_MW152S_211122**	**Normal**	**EP2114227**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW152S	**20 Jun 2022**	**0082_MW152S_220620**	**Normal**	**EP2207564**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW152S	**21 Nov 2022**	**0082_MW152S_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW152S	**26 Jun 2023**	**0082_MW152S_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW153S	**22 Jun 2018**	**0082_MW153S_180622**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	0.004	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW153S	**28 Nov 2019**	**0082_MW153S_191128**	**Normal**	**EP1912599**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02

					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids								
					Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting					0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Interim Marine 99%									0.00023						19				
PFAS NEMP 2020 Recreational Water															**10**				
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**															
MW153S	23 Jun 2020	0082_MW153S_200623	Normal	EP2006518	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW153S	16 Nov 2020	0082_MW153S_201116	Normal	EP2012669	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW153S	22 Jun 2021	0082_MW153S_210622	Normal	EP2107086	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW153S	23 Nov 2021	0082_MW153S_211123	Normal	EP2114294	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW153S	20 Jun 2022	0082_MW153S_220620	Normal	EP2207564	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW153S	21 Nov 2022	0082_MW153S_221121	Normal	EP2215715	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW153S	26 Jun 2023	0082_MW153S_230626	Normal	EP2308608	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW154S	20 Jun 2018	0082_MW154S_180620	Normal	212780	0.071	0.076	0.43	0.020	0.25	<0.002	0.034	0.071	0.10	0.036	0.033	<0.001	<0.002	<0.002	<0.005
MW154S	27 Nov 2019	0082_MW154S_191127	Normal	EP1912548	0.07	0.06	0.28	<0.02	0.22	<0.02	<0.1	0.05	0.08	0.02	0.02	<0.02	<0.02	<0.02	<0.02
MW154S	23 Jun 2020	0082_MW154S_200623	Normal	EP2006549	0.12	0.16	0.52	0.02	0.42	<0.02	<0.1	0.12	0.14	0.05	0.05	<0.02	<0.02	<0.02	<0.02
MW154S	16 Nov 2020	0082_MW154S_201116	Normal	EP2012669	0.11	0.12	0.56	0.03	0.73	<0.02	<0.1	0.09	0.14	0.06	0.05	<0.02	<0.02	<0.02	<0.02
MW154S	21 Jun 2021	0082_MW154S_210621	Normal	EP2107033	0.13	0.11	0.53	0.03	0.54	<0.02	<0.1	0.14	0.14	0.06	0.05	<0.02	<0.02	<0.02	<0.02
MW154S	22 Nov 2021	0082_MW154S_211122	Normal	EP2114227	0.20	0.14	0.87	0.04	1.12	<0.02	<0.1	0.18	0.27	0.09	0.08	<0.02	<0.02	<0.02	<0.02
MW154S	20 Jun 2022	0082_MW154S_220620	Normal	EP2207563	0.23	0.18	0.99	0.06	0.91	<0.02	<0.1	0.27	0.31	0.12	0.09	<0.02	<0.02	<0.02	<0.02
MW154S	21 Nov 2022	0082_MW154S_221121	Normal	EP2215715	0.21	0.25	1.15	0.06	0.85	<0.02	<0.1	0.26	0.28	0.11	0.08	<0.02	<0.02	<0.02	<0.02
MW154S	26 Jun 2023	0082_MW154S_230626	Normal	EP2308618	0.21	0.21	0.98	0.05	0.74	<0.02	<0.1	0.21	0.23	0.08	0.07	<0.02	<0.02	<0.02	<0.02
MW155S	22 Jun 2018	0082_MW155S_180622	Normal	212780	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW155S	27 Nov 2019	0082_MW155S_191127	Normal	EP1912548	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW155S	23 Jun 2020	0082_MW155S_200623	Normal	EP2006549	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW155S	16 Nov 2020	0082_MW155S_201116	Normal	EP2012669	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW155S	21 Jun 2021	0082_MW155S_210621	Normal	EP2107024	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW155S	22 Nov 2021	0082_MW155S_211122	Normal	EP2114226	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW155S	20 Jun 2022	0082_MW155S_220620	Normal	EP2207565	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW155S	21 Nov 2022	0082_MW155S_221121	Normal	EP2215643	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW155S	26 Jun 2023	0082_MW155S_230626	Normal	EP2308618	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW310	09 Mar 2018	0082_BDDBO20_180309	Normal	208025	1.4	1.6	5.9	0.10	0.78	<0.002	1.2	3.0	5.5	1.2	0.16	0.004	<0.002	<0.002	<0.005
MW310	18 Jun 2018	0082_B020_180618	Normal	212373	1.7	2.1	6.7	0.094	0.66	<0.002	1.3	3.3	6.9	1.2	0.17	0.006	<0.002	<0.002	<0.005
MW310	27 Nov 2019	0082_B020_191127	Normal	EP1912547	1.05	0.96	1.51	0.04	0.32	<0.02	0.7	1.73	4.00	0.28	0.07	<0.02	<0.02	<0.02	<0.02
MW310	27 Nov 2019	0082_QC103_191127	Field Duplicate	EP1912547	1.01	0.92	1.45	0.03	0.30	<0.02	0.7	1.72	3.91	0.27	0.06	<0.02	<0.02	<0.02	<0.02
MW310	27 Nov 2019	0082_QC203_191127	Interlab Duplicate	691496	0.97	1.2	1.6	0.04	0.30	<0.01	0.66	1.6	2.9	0.32	0.08	<0.01	<0.01	<0.01	<0.01
MW310	23 Jun 2020	0082_MW310_200623	Normal	EP2006519	1.71	2.56	4.74	0.09	0.82	<0.02	1.0	3.52	6.62	1.12	0.17	<0.02	<0.02	<0.02	<0.02
MW310	17 Nov 2020	0082_MW310_201117	Normal	EP2012739	2.39	1.78	3.04	0.06	0.65	<0.02	1.3	3.88	7.35	0.64	0.12	<0.02	<0.02	<0.02	<0.02
MW310	21 Jun 2021	0082_MW310_210621	Normal	EP2107028	1.50	2.36	12.0	0.27	3.66	<0.02	1.0	3.66	7.21	1.36	0.34	<0.02	<0.02	<0.02	<0.02
MW310	22 Nov 2021	0082_MW310_211122	Normal	EP2114224	7.46	5.20	8.40	0.12	1.71	<0.02	2.5	9.60	24.4	1.48	0.20	<0.02	<0.02	<0.02	<0.02
MW310	20 Jun 2022	0082_MW310_220620	Normal	EP2207565	5.83	7.56	37.7	0.66	5.74	<0.02	3.2	13.6	25.1	4.13	0.70	0.02	<0.02	<0.02	<0.02
MW310	21 Nov 2022	0082_MW310_221121	Normal	EP2215715	4.25	6.58	27.3	0.46	4.15	<0.02	3.8	11.5	23.0	3.29	0.54	<0.02	<0.02	<0.02	<0.02
MW310	26 Jun 2023	0082_MW310_230626	Normal	EP2308618	5.29	6.41	11.1	0.21	2.02	<0.02	3.3	6.93	15.6	2.22	0.31	<0.02	<0.02	<0.02	<0.02
MW311	18 Jun 2018	0082_B021_180618	Normal	212373	0.023	0.032	0.26	0.019	0.38	<0.002	0.15	0.36	2.1	0.09	0.032	0.004	<0.002	<0.002	<0.005
MW311	27 Nov 2019	0082_B021_191127	Normal	EP1912547	0.03	0.03	0.33	<0.02	0.41	<0.02	0.1	0.31	0.30	0.08	0.03	<0.02	<0.02	<0.02	<0.02
MW311	23 Jun 2020	0082_MW311_200623	Normal	EP2006519	0.04	0.06	0.42	<0.02	0.52	<0.02	0.2	0.51	0.40	0.15	0.06	<0.02	<0.02	<0.02	<0.02
MW311	17 Nov 2020	0082_MW311_201117	Normal	EP2012739	0.03	0.04	0.36	<0.02	0.55	<0.02	0.2	0.48	0.35	0.12	0.05	<0.02	<0.02	<0.02	<0.02
MW311	21 Jun 2021	0082_MW311_210621	Normal	EP2107028	<0.02	<0.02	0.49	<0.02	0.26	<0.02	<0.1	0.19	0.24	0.17	0.08	<0.02	<0.02	<0.02	<0.02
MW311	22 Nov 2021	0082_MW311_211122	Normal	EP2114224	0.03	<0.02	0.08	<0.02	0.08	<0.02	<0.1	0.04	0.06	0.04	0.02	<0.02	<0.02	<0.02	<0.02
MW311	22 Nov 2021	0082_QC105_211122	Field Duplicate	EP2114224	<0.02	<0.02	0.08	<0.02	0.09	<0.02	<0.1	0.04	0.05	0.04	0.02	<0.02	<0.02	<0.02	<0.02
MW311	22 Nov 2021	0082_QC205_211122	Interlab Duplicate	844500	<0.01	<0.01	0.08	<0.01	0.05	<0.01	<0.05	0.04	0.04	0.04	0.02	<0.01	<0.01	<0.01	<0.01
MW311	20 Jun 2022	0082_MW311_220620	Normal	EP2207565	<0.02	<0.02	0.12	<0.02	0.18	<0.02	<0.1	0.04	0.05	0.09	0.08	<0.02	<0.02	<0.02	<0.02
MW311	20 Jun 2022	0082_QC105_220620	Field Duplicate	EP2207565	<0.02	<0.02	0.12	<0.02	0.18	<0.02	<0.1	0.04	0.05	0.09	0.08	<0.02	<0.02	<0.02	<0.02
MW311	20 Jun 2022	0082_QC205_220620	Interlab Duplicate	901186	0.002	0.004	0.12	0.003	0.13	<0.004	0.028	0.041	0.046	0.074	0.079	0.008	<0.001	<0.001	<0.001
MW311	21 Nov 2022	0082_MW311_221121	Normal	EP2215715	<0.02	<0.02	0.17	<0.02	0.32	<0.02	<0.1	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
MW311	21 Nov 2022	0082_QC105_221121	Field Duplicate	EP2215715	<0.02	<0.02	0.19	<0.02	0.33	<0.02	<0.1	<0.02	0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
MW311	21 Nov 2022	0082_QC205_221120	Interlab Duplicate	945158	<0.01	<0.01	0.15	<0.01	0.09	<0.01	<0.05	0.02	0.02	0.02	0.02	<0.01	<0.01	<0.01	<0.01
MW311	26 Jun 2023	0082_MW311_230626	Normal	EP2308618	<0.02	<0.02	0.11	<0.02	0.22	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02
MW315	22 Feb 2018	0082_BA1_180222	Normal	207359	0.001	<0.001	<0.001	<0.001	0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW315	10 Jun 2018	0082_BA1_180610	Normal	212095	0.001	<0.001	<0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
MW315	27 Nov 2019	0082_BA1_191127	Normal	EP1912547	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW315	25 Jun 2020	0082_MW315_200625	Normal	EP2006593	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW315	17 Nov 2020	0082_MW315_201117	Normal	EP2012738	<0.02	<0.02	0.02	<0.02	0.10	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW315	21 Jun 2021	0082_MW315_210621	Normal	EP2107033	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW315	22 Nov 2021	0082_MW315_211122	Normal	EP2114224	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW315	20 Jun 2022	0082_MW315_220620	Normal	EP2207565	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW315	20 Jun 2022	0082_QC103_220620	Field Duplicate	EP2207565	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW315	20 Jun 2022	0082_QC203_220620	Interlab Duplicate	901186	<0.002	<0.002	0.003	<0.002	<0.004	<0.004	<0.008	<0.002	<0.001	<0.004	<0.001	<0.002	<0.001	<0.001	<0.001
MW315	21 Nov 2022	0082_MW315_221121	Normal	EP2215715	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW315	21 Nov 2022	0082_QC107_221121	Field Duplicate	EP2215715	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW315	21 Nov 2022	0082_QC207_221120	Interlab Duplicate	945158	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids								
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Interim Marine 99%					0.00023						19				
PFAS NEMP 2020 Recreational Water											**10**				
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**													
MW315	**26 Jun 2023**	**0082_MW315_230626**	**Normal**	**EP2308618**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW315	**26 Jun 2023**	**0082_QC104_230626**	**Field Duplicate**	**EP2308618**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW315	**26 Jun 2023**	**0082_QC204_230626**	**Interlab Duplicate**	**1004374**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW326	**22 Feb 2018**	**0082_BB8_180222**	**Normal**	**207359**	0.008	0.005	0.029	<0.001	0.007	<0.002	0.007	0.003	0.003	0.001	0.004	<0.001	<0.002	<0.002	<0.005
MW326	**21 Jun 2018**	**0082_BB8_180621**	**Normal**	**212780**	0.008	0.004	0.012	0.003	0.010	<0.002	0.006	<0.002	0.002	<0.001	0.003	<0.001	<0.002	<0.002	<0.005
MW326	**28 Nov 2019**	**0082_BB8_191128**	**Normal**	**EP1912606**	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW326	**28 Nov 2019**	**0082_QC101_191128**	**Field Duplicate**	**EP1912606**	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW326	**28 Nov 2019**	**0082_QC201_191128**	**Interlab Duplicate**	**691486**	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW326	**23 Jun 2020**	**0082_MW326_200623**	**Normal**	**EP2006519**	<0.02	<0.02	0.05	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW326	**17 Nov 2020**	**0082_MW326_201117**	**Normal**	**EP2012738**	<0.02	<0.02	0.06	<0.02	0.07	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW326	**17 Nov 2020**	**0082_QC104_201117**	**Field Duplicate**	**EP2012738**	<0.02	<0.02	0.05	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
MW326	**17 Nov 2020**	**0082_QC203_201117**	**Interlab Duplicate**	**758013**	0.01	<0.01	0.08	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW326	**21 Jun 2021**	**0082_MW326_210621**	**Normal**	**EP2107028**	<0.02	<0.02	0.06	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
MW326	**23 Nov 2021**	**0082_MW326_211123**	**Normal**	**EP2114295**	<0.02	<0.02	0.07	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
MW326	**20 Jun 2022**	**0082_MW326_220620**	**Normal**	**EP2207563**	0.02	<0.02	0.11	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02
MW326	**21 Nov 2022**	**0082_MW326_221121**	**Normal**	**EP2215643**	0.03	<0.02	0.09	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02
MW326	**26 Jun 2023**	**0082_MW326_230626**	**Normal**	**EP2308607**	<0.02	<0.02	0.07	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02
MW326	**26 Jun 2023**	**0082_QC102_230626**	**Field Duplicate**	**EP2308607**	<0.02	<0.02	0.06	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.02
MW326	**26 Jun 2023**	**0082_QC202_230626**	**Interlab Duplicate**	**1004374**	0.01	<0.01	0.05	<0.01	0.01	<0.01	<0.05	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01

First time detectionof PFOA or PFHxS+PFOS

New exceedance of guideline value

					PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							
				Perfluorobutane sulfonic acid (PFBS)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting				0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.001
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		**2**
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
MW022	**21 Feb 2018**	**0082_MW22_180221**	**Normal**	**207287**	0.2	<0.01	<0.05	0.002	0.95	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	
MW022	**09 Jun 2018**	**0082_MW22_180609**	**Normal**	**212095**	0.12	<0.01	<0.05	<0.001	0.26	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	**3.0**
MW022	**27 Nov 2019**	**0082_MW22_191127**	**Normal**	**EP1912548**	0.10	<0.02	<0.05	<0.05	0.40	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**3.72**
MW022	**27 Nov 2019**	**0082_QC104_191127**	**Field Duplicate**	**EP1912548**	0.10	<0.02	<0.05	<0.05	0.39	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**3.87**
MW022	**27 Nov 2019**	**0082_QC204_191127**	**Interlab Duplicate**	**691496**	0.10	<0.01	<0.01	<0.01	0.29	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**3.5**
MW022	**23 Jun 2020**	**0082_MW022_200623**	**Normal**	**EP2006549**	0.16	<0.02	<0.05	<0.05	0.46	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**6.49**
MW022	**22 Jun 2021**	**0082_MW022_210622**	**Normal**	**EP2107092**	0.09	<0.02	<0.05	<0.05	0.18	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**4.50**
MW022	**22 Nov 2021**	**0082_MW022_211122**	**Normal**	**EP2114224**	0.13	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.24**
MW022	**20 Jun 2022**	**0082_MW022_220620**	**Normal**	**EP2207563**	0.07	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.25**
MW022	**21 Nov 2022**	**0082_MW022_221121**	**Normal**	**EP2215715**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**2.75**
MW022	**26 Jun 2023**	**0082_MW022_230626**	**Normal**	**EP2308618**	0.03	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**3.89**
MW103D	**09 Mar 2018**	**0082_MW103D_180309**	**Normal**	**208025**	0.22	<0.01	<0.05	<0.001	0.10	0.008	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	**16**
MW103D	**09 Mar 2018**	**0082_QC1404_180309**	**Field Duplicate**	**208025**	0.23	<0.01	<0.05	<0.001	0.11	0.007	<0.001	0.02	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	**16**
MW103D	**09 Jun 2018**	**0082_MW103D_180609**	**Normal**	**212095**	0.19	<0.01	<0.05	<0.001	0.063	0.003	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	**10**
MW103D	**27 Nov 2019**	**0082_MW103D_191127**	**Normal**	**EP1912547**	0.26	<0.02	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**10.9**
MW103D	**23 Jun 2020**	**0082_MW103D_200623**	**Normal**	**EP2006519**	0.31	<0.02	<0.05	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**6.29**
MW103D	**23 Jun 2020**	**0082_QC103_200623**	**Field Duplicate**	**EP2006519**	0.22	<0.02	<0.05	<0.05	0.10	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**8.04**
MW103D	**23 Jun 2020**	**0082_QC203_200623**	**Interlab Duplicate**	**728790**	0.14	<0.01	<0.01	<0.01	0.08	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**6.8**
MW103D	**17 Nov 2020**	**0082_MW103D_201117**	**Normal**	**EP2012738**	0.20	<0.02	<0.05	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**6.08**
MW103D	**21 Jun 2021**	**0082_MW103D_210621**	**Normal**	**EP2107028**	0.27	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.46**
MW103D	**21 Jun 2021**	**0082_QC104_210621**	**Field Duplicate**	**EP2107028**	0.26	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.63**
MW103D	**21 Jun 2021**	**0082_QC204_210621**	**Interlab Duplicate**	**805490**	0.26	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**5.6**
MW103D	**23 Nov 2021**	**0082_MW103D_211123**	**Normal**	**EP2114295**	0.50	<0.02	<0.05	<0.05	0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**6.47**
MW103D	**20 Jun 2022**	**0082_MW103D_220620**	**Normal**	**EP2207565**	0.33	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.11**
MW103D	**21 Nov 2022**	**0082_MW103D_221121**	**Normal**	**EP2215715**	0.27	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.92**
MW103D	**26 Jun 2023**	**0082_MW103D_230626**	**Normal**	**EP2308618**	0.22	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**4.35**
MW105S	**09 Mar 2018**	**0082_MW105S_180309**	**Normal**	**208025**	0.055	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	**7.0**
MW105S	**04 Jun 2018**	**0082_MW105S_180604**	**Normal**	**211639**	0.057	<0.01	<0.05	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	**5.2**
MW105S	**27 Nov 2019**	**0082_MW105S_191127**	**Normal**	**EP1912547**	0.11	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.02**
MW105S	**21 Jun 2021**	**0082_MW105S_210621**	**Normal**	**EP2107028**	0.14	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**7.84**
MW105S	**23 Nov 2021**	**0082_MW105S_211123**	**Normal**	**EP2114293**	0.16	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**9.88**
MW105S	**20 Jun 2022**	**0082_MW105S_220620**	**Normal**	**EP2207565**	0.25	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**10.6**
MW105S	**21 Nov 2022**	**0082_MW105S_221121**	**Normal**	**EP2215643**	0.14	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**8.26**
MW105S	**26 Jun 2023**	**0082_MW105S_230626**	**Normal**	**EP2308607**	0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**6.09**
MW108	**07 Mar 2018**	**0082_MW108_180307**	**Normal**	**208025**	0.009	<0.01	<0.05	<0.001	0.004	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.10
MW108	**18 Jun 2018**	**0082_MW108_180618**	**Normal**	**212373**	0.008	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.12
MW108	**21 Nov 2022**	**0082_MW108_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14
MW108	**26 Jun 2023**	**0082_MW108_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16
MW113	**10 Mar 2018**	**0082_MW113_180310**	**Normal**	**208025**	0.026	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.30
MW113	**09 Jun 2018**	**0082_MW113_180609**	**Normal**	**212095**	0.026	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.27
MW113	**27 Nov 2019**	**0082_MW113_191127**	**Normal**	**EP1912547**	0.03	<0.02	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.71
MW113	**23 Jun 2020**	**0082_MW113_200623**	**Normal**	**EP2006519**	0.03	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.29
MW113	**17 Nov 2020**	**0082_MW113_201117**	**Normal**	**EP2012738**	0.03	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.28
MW113	**17 Nov 2020**	**0082_QC106_201117**	**Field Duplicate**	**EP2012738**	0.03	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.29
MW113	**17 Nov 2020**	**0082_QC206_201117**	**Interlab Duplicate**	**758013**	0.02	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.39
MW113	**21 Jun 2021**	**0082_MW113_210621**	**Normal**	**EP2107028**	0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.29
MW113	**23 Nov 2021**	**0082_MW113_211123**	**Normal**	**EP2114293**	0.03	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.32
MW113	**23 Nov 2021**	**0082_QC107_211123**	**Field Duplicate**	**EP2114293**	0.04	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.31
MW113	**23 Nov 2021**	**0082_QC207_211123**	**Interlab Duplicate**	**844500**	0.03	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.32
MW113	**20 Jun 2022**	**0082_MW113_220620**	**Normal**	**EP2207565**	0.03	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.27
MW113	**21 Nov 2022**	**0082_MW113_221121**	**Normal**	**EP2215715**	0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.28
MW113	**26 Jun 2023**	**0082_MW113_230626**	**Normal**	**EP2308618**	0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.17
MW115	**08 Mar 2018**	**0082_MW115_180308**	**Normal**	**208025**	0.008	<0.01	<0.05	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.40
MW115	**09 Jun 2018**	**0082_MW115_180609**	**Normal**	**212095**	0.009	<0.01	<0.05	<0.001	0.009	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.17
MW115	**27 Nov 2019**	**0082_MW115_191127**	**Normal**	**EP1912547**	0.15	<0.02	<0.05	<0.05	3.80	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**12.3**
MW115	**23 Jun 2020**	**0082_MW115_200623**	**Normal**	**EP2006519**	0.26	<0.02	<0.05	<0.05	5.53	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**14.4**
MW115	**17 Nov 2020**	**0082_MW115_201117**	**Normal**	**EP2012738**	0.17	<0.02	<0.05	<0.05	6.08	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**15.9**
MW115	**21 Jun 2021**	**0082_MW115_210621**	**Normal**	**EP2107028**	0.17	<0.02	<0.05	<0.05	4.51	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**15.6**
MW115	**22 Nov 2021**	**0082_MW115_211122**	**Normal**	**EP2114224**	0.33	<0.02	<0.05	<0.05	7.82	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**20.6**
MW115	**22 Nov 2021**	**0082_QC106_211122**	**Field Duplicate**	**EP2114224**	0.30	<0.02	<0.05	<0.05	6.77	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**18.9**
MW115	**22 Nov 2021**	**0082_QC206_211122**	**Interlab Duplicate**	**844500**	0.25	<0.01	<0.01	<0.01	6.8	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**18.8**
MW115	**20 Jun 2022**	**0082_MW115_220620**	**Normal**	**EP2207565**	0.25	<0.02	<0.05	<0.05	6.16	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**17.4**
MW115	**21 Nov 2022**	**0082_MW115_221121**	**Normal**	**EP2215715**	0.22	<0.02	<0.05	<0.05	6.15	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**19.5**
MW115	**26 Jun 2023**	**0082_MW115_230626**	**Normal**	**EP2308618**	0.15	<0.02	<0.05	<0.05	0.49	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**11.7**
MW118D	**05 Mar 2018**	**0082_MW118D_180305**	**Normal**	**207818**	1.2	<0.01	<0.05	0.1	30	0.12	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	**31**

					PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							
				Perfluorobutane sulfonic acid (PFBS)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting				0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.001
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		**2**
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
MW118D	**09 Jun 2018**	**0082_MW118D_180609**	**Normal**	**212095**	0.82	<0.1	<0.5	0.080	18	0.069	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5	**18**
MW118D	**09 Jun 2018**	**0082_QC156_180609**	**Field Duplicate**	**212095**	1.1	<0.1	<0.5	0.080	21	0.054	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5	**24**
MW118D	**09 Jun 2018**	**0082_QC256_180609**	**Interlab Duplicate**	**604115**	1.2	<0.01	<0.01	0.10	13	0.11	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**35.3**
MW118D	**27 Nov 2019**	**0082_MW118D_191127**	**Normal**	**EP1912548**	0.90	<0.02	<0.05	0.08	19.2	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**23.4**
MW118D	**23 Jun 2020**	**0082_MW118D_200623**	**Normal**	**EP2006549**	0.82	<0.02	<0.05	0.10	14.8	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**18.7**
MW118D	**16 Nov 2020**	**0082_MW118D_201116**	**Normal**	**EP2012669**	0.83	<0.02	<0.05	<0.05	15.6	0.06	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**20.5**
MW118D	**21 Jun 2021**	**0082_MW118D_210621**	**Normal**	**EP2107033**	0.70	<0.02	<0.05	0.06	12.5	0.08	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**18.4**
MW118D	**22 Nov 2021**	**0082_MW118D_211122**	**Normal**	**EP2114224**	0.66	<0.02	<0.05	<0.05	11.6	0.06	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**15.4**
MW118D	**20 Jun 2022**	**0082_MW118D_220620**	**Normal**	**EP2207563**	0.45	<0.02	<0.05	<0.05	9.70	0.07	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**12.6**
MW118D	**21 Nov 2022**	**0082_MW118D_221121**	**Normal**	**EP2215715**	0.30	<0.02	<0.05	<0.05	4.05	0.13	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**13.0**
MW118D	**26 Jun 2023**	**0082_MW118D_230626**	**Normal**	**EP2308618**	0.32	<0.02	<0.05	<0.05	4.35	0.08	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**10.3**
MW122	**05 Mar 2018**	**0082_MW122_180305**	**Normal**	**207818**	0.21	<0.01	<0.05	0.003	0.072	0.003	0.001	0.02	<0.005	0.006	0.02	<0.01	0.006	<0.05	**2.3**
MW122	**16 Jun 2018**	**0082_MW122_180616**	**Normal**	**212373**	0.24	<0.01	<0.05	0.003	0.07	<0.001	<0.001	<0.01	<0.01	<0.002	<0.01	<0.01	<0.002	<0.05	**2.7**
MW122	**27 Nov 2019**	**0082_MW122_191127**	**Normal**	**EP1912549**	0.28	<0.02	<0.05	<0.05	0.10	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**2.75**
MW122	**23 Jun 2020**	**0082_MW122_200623**	**Normal**	**EP2006549**	0.34	<0.02	<0.05	<0.05	0.13	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**3.41**
MW122	**16 Nov 2020**	**0082_MW122_201116**	**Normal**	**EP2012669**	0.15	<0.02	<0.05	<0.05	0.10	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.78
MW122	**22 Jun 2021**	**0082_MW122_210622**	**Normal**	**EP2107092**	0.15	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.66
MW122	**23 Nov 2021**	**0082_MW122_211123**	**Normal**	**EP2114295**	0.29	<0.02	<0.05	<0.05	0.16	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**3.19**
MW122	**20 Jun 2022**	**0082_MW122_220620**	**Normal**	**EP2207565**	0.24	<0.02	<0.05	<0.05	0.09	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**2.27**
MW122	**26 Jun 2023**	**0082_MW122_230626**	**Normal**	**EP2308607**	0.12	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.09
MW126	**05 Mar 2018**	**0082_MW126_180305**	**Normal**	**207818**	0.011	<0.01	<0.05	<0.001	0.05	0.002	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.4
MW126	**16 Jun 2018**	**0082_MW126_180616**	**Normal**	**212373**	0.006	<0.01	<0.05	<0.001	0.033	0.004	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.31
MW126	**27 Nov 2019**	**0082_MW126_191127**	**Normal**	**EP1912546**	0.08	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.75
MW126	**23 Jun 2020**	**0082_MW126_200623**	**Normal**	**EP2006549**	0.08	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.66
MW126	**21 Jun 2021**	**0082_MW126_210621**	**Normal**	**EP2107033**	0.06	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**2.90**
MW126	**22 Nov 2021**	**0082_MW126_211122**	**Normal**	**EP2114226**	0.03	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.97
MW126	**20 Jun 2022**	**0082_MW126_220620**	**Normal**	**EP2207564**	0.14	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**3.62**
MW126	**21 Nov 2022**	**0082_MW126_221121**	**Normal**	**EP2215715**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.52
MW126	**26 Jun 2023**	**0082_MW126_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.44
MW128	**05 Mar 2018**	**0082_MW128_4.2_180305**	**Normal**	**207818**	<0.001	<0.01	<0.05	<0.001	0.094	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW128	**05 Mar 2018**	**0082_MW128_6.2_180305**	**Normal**	**207818**	<0.001	<0.01	<0.05	<0.001	0.02	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW128	**05 Mar 2018**	**0082_MW128_8.2_180305**	**Normal**	**207818**	<0.001	<0.01	<0.05	<0.001	0.019	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW128	**15 Jun 2018**	**0082_MW128_3.7-4.2_180615**	**Normal**	**212373**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002	<0.01	<0.01	<0.002	<0.05	<0.001
MW128	**15 Jun 2018**	**0082_MW128_5.7-6.2_180615**	**Normal**	**212373**	<0.001	<0.01	<0.05	<0.001	0.001	<0.001	<0.001	<0.01	<0.01	<0.002	<0.01	<0.01	<0.002	<0.05	<0.001
MW128	**15 Jun 2018**	**0082_MW128_7.7-8.2_180615**	**Normal**	**212373**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.01	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW128	**27 Nov 2019**	**0082_MW128_3.7-4.2_191127**	**Normal**	**EP1912546**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW128	**23 Jun 2020**	**0082_MW128_200623**	**Normal**	**EP2006518**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW128	**16 Nov 2020**	**0082_MW128_201116**	**Normal**	**EP2012670**	<0.05	<0.05	<0.12	<0.05	<0.05	<0.05	<0.05	<0.05	<0.12	<0.05	<0.12	<0.12	<0.05	<0.12	<0.05
MW128	**21 Jun 2021**	**0082_MW128_3.7-4.2_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW128	**22 Nov 2021**	**0082_MW128_3.7-4.2_211122**	**Normal**	**EP2114224**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW128	**20 Jun 2022**	**0082_MW128_220620**	**Normal**	**EP2207565**	0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03
MW128	**20 Nov 2022**	**0082_MW128_3.7-4.2_221120**	**Normal**	**EP2215643**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW128	**26 Jun 2023**	**0082_MW128_3.7-4.2_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW129	**05 Mar 2018**	**0082_MW129_3.5-4.0_180305**	**Normal**	**207818**	<0.001	<0.01	<0.05	<0.001	0.005	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW129	**05 Mar 2018**	**0082_MW129_5.5-6.0_180305**	**Normal**	**207818**	<0.001	<0.01	<0.05	<0.001	0.012	<0.001	<0.001	<0.01	<0.005	0.002	<0.005	<0.01	0.003	<0.05	<0.001
MW129	**05 Mar 2018**	**0082_MW129_7.5-8.0_180305**	**Normal**	**207818**	<0.001	<0.01	<0.05	<0.001	0.014	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW129	**21 Jun 2018**	**0082_MW129_3.5-4.0_180621**	**Normal**	**212780**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW129	**21 Jun 2018**	**0082_MW129_5.5-6.0_180621**	**Normal**	**212780**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW129	**21 Jun 2018**	**0082_MW129_7.5-8.0_180621**	**Normal**	**212780**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW129	**27 Nov 2019**	**0082_MW129_3.5-4.0_191127**	**Normal**	**EP1912546**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW129	**23 Jun 2020**	**0082_MW129_200623**	**Normal**	**EP2006518**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW129	**16 Nov 2020**	**0082_MW129_201116**	**Normal**	**EP2012737**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW129	**21 Jun 2021**	**0082_MW129_3.5-4.0_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW129	**22 Nov 2021**	**0082_MW129_3.5-4_211122**	**Normal**	**EP2114226**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW129	**20 Jun 2022**	**0082_MW129_3.5-4_220620**	**Normal**	**EP2207564**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW129	**20 Jun 2022**	**0082_QC106_220620**	**Field Duplicate**	**EP2207564**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW129	**20 Jun 2022**	**0082_QC206_220620**	**Interlab Duplicate**	**901186**	<0.002	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.067
MW129	**20 Nov 2022**	**0082_MW129_3.5-4.0_221120**	**Normal**	**EP2215643**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW129	**26 Jun 2023**	**0082_MW129_3.5-4.0_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW130	**05 Mar 2018**	**0082_MW130_2.8-3.3_180305**	**Normal**	**207818**	<0.001	<0.1	<0.05	<0.001	0.02	<0.001	<0.001	<0.1	<0.005	<0.02	<0.005	<0.01	<0.02	<0.05	<0.001
MW130	**05 Mar 2018**	**0082_MW130_4.8-5.3_180305**	**Normal**	**207818**	<0.001	<0.1	<0.05	<0.001	0.014	<0.001	<0.001	<0.1	<0.005	<0.02	<0.005	<0.01	<0.02	<0.05	0.1
MW130	**05 Mar 2018**	**0082_MW130_6.8-7.3_180305**	**Normal**	**207818**	<0.001	<0.1	<0.05	<0.001	0.02	<0.001	<0.001	<0.1	<0.05	<0.02	<0.005	<0.1	<0.02	<0.05	<0.001
MW130	**20 Jun 2018**	**0082_MW130_4.8-5.3_180620**	**Normal**	**212780**	0.002	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.16
MW130	**20 Jun 2018**	**0082_MW130_6.8-7.3_180620**	**Normal**	**212780**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.004
MW130	**20 Jun 2018**	**0082_QC272_180620**	**Interlab Duplicate**	**605980**	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.38

					PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							
				Perfluorobutane sulfonic acid (PFBS)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting				0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.001
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		**2**
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
MW130	**23 Jun 2018**	**0082_MW130_2.8-3.3_180623**	**Normal**	**212780**	<0.001	<0.01	<0.05	<0.001	0.004	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.004
MW130	**23 Jun 2020**	**0082_MW130_200623**	**Normal**	**EP2006518**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW130	**16 Nov 2020**	**0082_MW130_201116**	**Normal**	**EP2012737**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02
MW130	**21 Jun 2021**	**0082_MW130_6.9-7.4_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02
MW130	**22 Nov 2021**	**0082_MW130_211122**	**Normal**	**EP2114226**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW130	**20 Jun 2022**	**0082_MW130_2.9-3.4_220620**	**Normal**	**EP2207564**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW130	**20 Nov 2022**	**0082_MW130_2.9-3.4_221120**	**Normal**	**EP2215643**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW130	**26 Jun 2023**	**0082_MW130_4.9-5.4_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW131	**10 Mar 2018**	**0082_MW131_2.0-2.5_180310**	**Normal**	**208025**	0.001	<0.01	<0.05	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW131	**10 Mar 2018**	**0082_MW131_4.0-4.5_180310**	**Normal**	**208025**	<0.050	<0.50	<2.5	<0.050	<0.050	<0.050	<0.050	<0.50	<0.20	<0.10	<0.20	<0.50	<0.10	<2.5	<0.001
MW131	**10 Mar 2018**	**0082_MW131_6.0-6.5_180310**	**Normal**	**208025**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW131	**10 Mar 2018**	**0082_MW131_8.0-8.5_180310**	**Normal**	**208025**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW131	**20 Jun 2018**	**0082_MW131_2.0-2.5_180620**	**Normal**	**212570**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.02	<0.01	<0.004	<0.01	<0.02	<0.004	<0.1	
MW131	**20 Jun 2018**	**0082_MW131_4.0-4.5_180620**	**Normal**	**212570**	0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.02	<0.01	<0.004	<0.01	<0.02	<0.004	<0.1	
MW131	**20 Jun 2018**	**0082_MW131_6.0-6.5_180620**	**Normal**	**212570**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.02	<0.01	<0.004	<0.01	<0.02	<0.004	<0.1	
MW131	**20 Jun 2018**	**0082_MW131_8.0-8.5_180620**	**Normal**	**212570**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.02	<0.01	<0.004	<0.01	<0.02	<0.004	<0.1	
MW131	**28 Nov 2019**	**0082_MW131_4.0-4.5_191128**	**Normal**	**EP1912609**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW131	**23 Jun 2020**	**0082_MW131_200623**	**Normal**	**EP2006518**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW131	**16 Nov 2020**	**0082_MW131_201116**	**Normal**	**EP2012737**	<0.02	<0.02	<0.05	<0.05	<0.05	0.06	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02
MW131	**21 Jun 2021**	**0082_MW131_4.0-4.5_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW131	**22 Nov 2021**	**0082_MW131_211122**	**Normal**	**EP2114226**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW131	**20 Jun 2022**	**0082_MW131_2-2.5_220620**	**Normal**	**EP2207564**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW131	**20 Nov 2022**	**0082_MW131_4.0-4.5_221120**	**Normal**	**EP2215643**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW131	**26 Jun 2023**	**0082_MW131_4.0-4.5_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW132	**10 Mar 2018**	**0082_MW132_6.4-6.9_180310**	**Normal**	**208025**	0.015	<0.02	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.001
MW132	**10 Mar 2018**	**0082_MW132_8.5-9.0_180310**	**Normal**	**208025**	0.003	<0.01	<0.05	<0.001	0.002	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW132	**21 Jun 2018**	**0082_MW132_6.4-6.9_180621**	**Normal**	**212780**	0.018	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.010
MW132	**21 Jun 2018**	**0082_MW132_8.5-9.0_180621**	**Normal**	**212780**	0.002	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.002
MW132	**27 Nov 2019**	**0082_MW132_6.4-6.9_191127**	**Normal**	**EP1912546**	0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05
MW132	**23 Jun 2020**	**0082_MW132_200623**	**Normal**	**EP2006549**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05
MW132	**16 Nov 2020**	**0082_MW132_201116**	**Normal**	**EP2012670**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04
MW132	**21 Jun 2021**	**0082_MW132_8.5-9.0_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW132	**22 Nov 2021**	**0082_MW132_6.4-6.9_211122**	**Normal**	**EP2114224**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW132	**20 Jun 2022**	**0082_MW132_6.4-6.9_220620**	**Normal**	**EP2207564**	0.04	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.19
MW132	**21 Nov 2022**	**0082_MW132_6.4-6.9_221121**	**Normal**	**EP2215643**	0.04	<0.02	<0.05	<0.05	0.14	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.17
MW132	**26 Jun 2023**	**0082_MW132_6.4-6.9_230626**	**Normal**	**EP2308608**	0.03	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12
MW133	**10 Mar 2018**	**0082_MW133_3.0-3.5_180310**	**Normal**	**208025**	0.002	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW133	**10 Mar 2018**	**0082_MW133_5.0-5.5_180310**	**Normal**	**208025**	0.002	<0.01	<0.05	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW133	**10 Mar 2018**	**0082_MW133_7.0-7.5_180310**	**Normal**	**208025**	0.002	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW133	**10 Mar 2018**	**0082_QC1405_180310**	**Field Duplicate**	**208025**	<0.01	<0.02	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.001
MW133	**21 Jun 2018**	**0082_MW133_3.0-3.5_180621**	**Normal**	**212780**	0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.022
MW133	**21 Jun 2018**	**0082_MW133_5.0-5.5_180621**	**Normal**	**212780**	0.002	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.029
MW133	**21 Jun 2018**	**0082_MW133_7.0-7.5_180621**	**Normal**	**212780**	0.002	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.008
MW133	**27 Nov 2019**	**0082_MW133_3.0-3.5_191127**	**Normal**	**EP1912548**	<0.02	<0.02	<0.05	<0.05	0.35	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16
MW133	**23 Jun 2020**	**0082_MW133_200623**	**Normal**	**EP2006549**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03
MW133	**16 Nov 2020**	**0082_MW133_201116**	**Normal**	**EP2012737**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06
MW133	**21 Jun 2021**	**0082_MW133_3.0-3.5_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW133	**22 Nov 2021**	**0082_MW133_3-3.5_211122**	**Normal**	**EP2114224**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW133	**20 Jun 2022**	**0082_MW133_220620**	**Normal**	**EP2207564**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02
MW133	**21 Nov 2022**	**0082_MW133_3-3.5_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05
MW133	**26 Jun 2023**	**0082_MW133_3.0-3.5_230626**	**Normal**	**EP2308618**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03
MW134	**09 Mar 2018**	**0082_MW134_6.6-7.1_180309**	**Normal**	**208025**	<0.01	<0.02	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.001
MW134	**09 Mar 2018**	**0082_MW134_8.6-9.1_180309**	**Normal**	**208025**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW134	**22 Jun 2018**	**0082_MW134_6.6-7.1_180622**	**Normal**	**212780**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW134	**22 Jun 2018**	**0082_MW134_8.6-9.1_180622**	**Normal**	**212780**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.002
MW134	**27 Nov 2019**	**0082_MW134D_191127**	**Normal**	**EP1912549**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW134	**23 Jun 2020**	**0082_MW134_6.6_200623**	**Normal**	**EP2006519**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW134	**17 Nov 2020**	**0082_MW134_201117**	**Normal**	**EP2012748**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW134	**17 Nov 2020**	**0082_QC105_201117**	**Field Duplicate**	**EP2012748**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW134	**17 Nov 2020**	**0082_QC205_201117**	**Interlab Duplicate**	**758013**	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.17
MW134	**21 Jun 2021**	**0082_MW134_210621**	**Normal**	**EP2107033**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW134	**22 Nov 2021**	**0082_MW134_211122**	**Normal**	**EP2114227**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW134	**20 Jun 2022**	**0082_MW134_6.6-7.1_220620**	**Normal**	**EP2207563**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW134	**21 Nov 2022**	**0082_MW134_6.6-7.1_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW134	**26 Jun 2023**	**0082_MW134_6.6-7.1_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01

				PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							
	Perfluorobutane sulfonic acid (PFBS)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.001
PFAS NEMP 2020 Interim Marine 99%															
PFAS NEMP 2020 Recreational Water															**2**

Location Code	Date	Field ID	Sample Type	Lab Report Number													
MW135	09 Mar 2018	0082_MW135_8.3-8.8_180309	Normal	208025	<0.01	<0.1	<0.5	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.1	<0.05	<0.02	<0.5	<0.01
MW135	09 Mar 2018	0082_MW135_10.3-10.8_180309	Normal	208025	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW135	22 Jun 2018	0082_MW135_8.3-8.8_180622	Normal	212780	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.007
MW135	22 Jun 2018	0082_MW135_10.3-10.8_180622	Normal	212780	<0.001	<0.01	<0.05	<0.001	0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.012
MW135	27 Nov 2019	0082_MW135_191127	Normal	EP1912547	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW135	17 Nov 2020	0082_MW135_201117	Normal	EP2012748	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW135	21 Jun 2021	0082_MW135_210621	Normal	EP2107028	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW135	23 Nov 2021	0082_MW135_8.3-8.8_211123	Normal	EP2114294	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW135	20 Jun 2022	0082_MW135_10.3-10.8_220620	Normal	EP2207563	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW135	21 Nov 2022	0082_MW135_10.3-10.8_221121	Normal	EP2215643	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW135	26 Jun 2023	0082_MW135_10.3-10.8_230626	Normal	EP2308608	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW137	09 Mar 2018	0082_MW137_6.1-6.6_180309	Normal	208025	<0.01	<0.02	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.001
MW137	09 Mar 2018	0082_MW137_8.1-8.6_180309	Normal	208025	<0.01	<0.02	<0.05	<0.01	<0.01	<0.01	<0.01	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.001
MW137	09 Mar 2018	0082_MW137_10.1-10.6_180309	Normal	208025	<0.001	<0.01	<0.05	<0.001	0.009	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW137	21 Jun 2018	0082_QC276_180622	Interlab Duplicate	605977	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
MW137	22 Jun 2018	0082_MW137_6.0-6.6_180622	Normal	212780	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.001
MW137	22 Jun 2018	0082_MW137_8.1-8.6_180622	Normal	212780	<0.001	<0.01	<0.05	<0.001	0.004	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.007
MW137	22 Jun 2018	0082_MW137_10.1-10.6_180622	Normal	212780	<0.001	<0.01	<0.05	<0.001	0.003	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.005
MW137	22 Jun 2018	0082_QC176_180622	Field Duplicate	212780	<0.001	<0.01	<0.05	<0.001	0.004	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.007
MW137	27 Nov 2019	0082_MW137_6.1-6.6_191127	Normal	EP1912548	<0.02	<0.02	<0.05	<0.05	0.27	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW137	23 Jun 2020	0082_MW137_200623	Normal	EP2006549	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW137	16 Nov 2020	0082_MW137_6.6_201116	Normal	EP2012669	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW137	21 Jun 2021	0082_MW137_8.1-8.6_210621	Normal	EP2107024	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW137	22 Nov 2021	0082_MW137_211122	Normal	EP2114226	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW137	20 Jun 2022	0082_MW137_220620	Normal	EP2207565	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW137	21 Nov 2022	0082_MW137_6.1-6.6_221121	Normal	EP2215643	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW137	26 Jun 2023	0082_MW137_6.1-6.6_230626	Normal	EP2308618	<0.02	<0.02	<0.05	<0.05	1.06	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07
MW142	22 Jun 2018	0082_MW142_180622	Normal	212780	0.042	<0.1	<0.5	0.011	8.0	0.033	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5	**7.4**
MW142	27 Nov 2019	0082_MW142_191127	Normal	EP1912547	0.04	<0.02	<0.05	<0.05	4.71	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.64**
MW142	23 Jun 2020	0082_MW142_200623	Normal	EP2006519	0.08	<0.02	<0.05	<0.05	2.51	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**7.15**
MW142	17 Nov 2020	0082_MW142_201117	Normal	EP2012739	0.03	<0.02	<0.05	<0.05	1.22	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**6.66**
MW142	21 Jun 2021	0082_MW142_210621	Normal	EP2107028	0.42	<0.02	<0.05	<0.05	4.74	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**51.9**
MW142	21 Jun 2021	0082_QC103_210621	Field Duplicate	EP2107028	0.24	<0.02	<0.05	<0.05	3.15	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**29.3**
MW142	21 Jun 2021	0082_QC203_210621	Interlab Duplicate	805490	0.46	<0.01	<0.01	<0.01	4.7	0.02	1.8	<0.05	0.11	0.16	0.07	0.17	0.33	0.10	**63.6**
MW142	22 Nov 2021	0082_MW142_211122	Normal	EP2114224	0.06	<0.02	<0.05	<0.05	0.81	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**9.56**
MW142	22 Nov 2021	0082_QC104_211122	Field Duplicate	EP2114224	0.06	<0.02	<0.05	<0.05	0.78	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**8.58**
MW142	22 Nov 2021	0082_QC204_211122	Interlab Duplicate	844500	0.05	<0.01	<0.01	<0.01	0.64	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**6.81**
MW142	20 Jun 2022	0082_MW142_220620	Normal	EP2207565	0.63	<0.02	<0.05	<0.05	9.43	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**66.5**
MW142	20 Jun 2022	0082_QC104_220620	Field Duplicate	EP2207565	0.64	<0.02	<0.05	<0.05	8.92	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**70.2**
MW142	20 Jun 2022	0082_QC204_220620	Interlab Duplicate	901186	0.12	<0.001	<0.001	<0.008	0.53	0.008	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	**5.2**
MW142	21 Nov 2022	0082_MW142_221121	Normal	EP2215715	0.16	<0.02	<0.05	<0.05	4.00	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**22.8**
MW142	26 Jun 2023	0082_MW142_230626	Normal	EP2308618	0.07	<0.02	<0.05	<0.05	2.13	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**8.83**
MW142	26 Jun 2023	0082_QC103_230626	Field Duplicate	EP2308618	0.06	<0.02	<0.05	<0.05	2.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**11.5**
MW142	26 Jun 2023	0082_QC203_230626	Interlab Duplicate	1004374	0.04	<0.01	<0.01	<0.01	2.4	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**12.59**
MW143	23 Jun 2018	0082_MW143_180623	Normal	212780	0.042	<0.1	<0.5	<0.01	0.99	<0.01	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5	**4.6**
MW143	27 Nov 2019	0082_MW143_191127	Normal	EP1912547	<0.02	<0.02	<0.05	<0.05	0.92	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**9.48**
MW143	27 Nov 2019	0082_QC102_191127	Field Duplicate	EP1912547	0.02	<0.02	<0.05	<0.05	0.94	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**8.98**
MW143	27 Nov 2019	0082_QC202_191127	Interlab Duplicate	691496	0.02	<0.01	<0.01	<0.01	0.89	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**7.66**
MW143	23 Jun 2020	0082_MW143_200623	Normal	EP2006519	0.06	<0.02	<0.05	<0.05	1.22	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.35**
MW143	17 Nov 2020	0082_MW143_201117	Normal	EP2012739	0.04	<0.02	<0.05	<0.05	0.87	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.34**
MW143	21 Jun 2021	0082_MW143_210621	Normal	EP2107028	0.06	<0.02	<0.05	<0.05	1.48	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**3.36**
MW143	23 Nov 2021	0082_MW143_211123	Normal	EP2114293	0.08	<0.02	<0.05	<0.05	0.79	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.64**
MW143	20 Jun 2022	0082_MW143_220620	Normal	EP2207565	0.06	<0.02	<0.05	<0.05	1.03	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.02**
MW143	21 Nov 2022	0082_MW143_221121	Normal	EP2215715	0.02	<0.02	<0.05	<0.05	1.32	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**7.18**
MW143	26 Jun 2023	0082_MW143_230626	Normal	EP2308618	0.03	<0.02	<0.05	<0.05	1.34	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.10**
MW144S	23 Jun 2018	0082_MW144S_180623	Normal	212780	0.26	<0.1	<0.5	<0.01	0.70	0.15	<0.01	<0.1	<0.05	<0.02	<0.05	<0.1	<0.02	<0.5	**4.6**
MW144S	28 Nov 2019	0082_MW144_S_191128	Normal	EP1912606	0.24	<0.02	<0.05	<0.05	0.61	0.14	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**12.3**
MW144S	25 Jun 2020	0082_MW144S_200625	Normal	EP2006593	0.22	<0.02	<0.05	<0.05	0.30	0.30	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**7.98**
MW144S	17 Nov 2020	0082_MW144_S_201117	Normal	EP2012739	0.20	<0.02	<0.05	<0.05	0.33	0.35	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**8.06**
MW144S	17 Nov 2020	0082_QC103_201117	Field Duplicate	EP2012739	0.20	<0.02	<0.05	<0.05	0.33	0.37	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**8.98**
MW144S	17 Nov 2020	0082_QC204_201117	Interlab Duplicate	758013	0.18	<0.01	<0.01	<0.01	0.24	0.13	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**10.9**
MW144S	21 Jun 2021	0082_MW144S_210621	Normal	EP2107033	0.27	<0.02	<0.05	<0.05	0.54	0.16	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**11.2**
MW144S	22 Nov 2021	0082_MW144S_211122	Normal	EP2114224	0.29	<0.02	<0.05	<0.05	0.68	0.08	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**13.3**
MW144S	20 Jun 2022	0082_MW144S_220620	Normal	EP2207565	0.24	<0.02	<0.05	<0.05	0.37	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**9.99**
MW144S	21 Nov 2022	0082_MW144S_221121	Normal	EP2215643	0.21	<0.02	<0.05	<0.05	0.59	0.06	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**12.8**

					PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							
				Perfluorobutane sulfonic acid (PFBS)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting				0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.001
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		**2**
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
MW144S	**21 Nov 2022**	**0082_QC106_221121**	**Field Duplicate**	**EP2215643**	0.19	<0.02	<0.05	<0.05	0.64	0.07	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**12.4**
MW144S	**21 Nov 2022**	**0082_QC206_221120**	**Interlab Duplicate**	**945158**	0.19	<0.01	<0.01	<0.01	0.54	0.10	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	**15.7**
MW144S	**26 Jun 2023**	**0082_MW144S_230626**	**Normal**	**EP2308607**	0.33	<0.02	<0.05	<0.05	0.32	0.12	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**9.67**
MW145	**20 Jun 2018**	**0082_MW145_180620**	**Normal**	**212570**	0.41	<0.01	<0.05	<0.001	0.031	<0.001	<0.001	<0.02	<0.01	<0.004	<0.01	<0.02	<0.004	<0.1	
MW145	**27 Nov 2019**	**0082_MW145_191127**	**Normal**	**EP1912549**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW145	**25 Jun 2020**	**0082_MW145_200625**	**Normal**	**EP2006593**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW145	**25 Jun 2020**	**0082_QC101_200625**	**Field Duplicate**	**EP2006593**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW145	**25 Jun 2020**	**0082_QC201_200625**	**Interlab Duplicate**	**729348**	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
MW145	**17 Nov 2020**	**0082_MW145_201117**	**Normal**	**EP2012738**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW145	**21 Jun 2021**	**0082_MW145_210621**	**Normal**	**EP2107028**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW145	**21 Jun 2021**	**0082_QC106_210621**	**Field Duplicate**	**EP2107028**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW145	**21 Jun 2021**	**0082_QC206_210621**	**Interlab Duplicate**	**805490**	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
MW145	**22 Nov 2021**	**0082_MW145_211122**	**Normal**	**EP2114227**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW145	**20 Jun 2022**	**0082_MW145_220620**	**Normal**	**EP2207563**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW145	**21 Nov 2022**	**0082_MW145_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW145	**21 Nov 2022**	**0082_QC104_221121**	**Field Duplicate**	**EP2215643**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW145	**21 Nov 2022**	**0082_QC204_221120**	**Interlab Duplicate**	**945158**	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
MW145	**26 Jun 2023**	**0082_MW145_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW147	**21 Jun 2018**	**0082_MW147_180621**	**Normal**	**212780**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.008
MW147	**27 Nov 2019**	**0082_MW147_191127**	**Normal**	**EP1912549**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW147	**17 Nov 2020**	**0082_MW147_201117**	**Normal**	**EP2012748**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW147	**22 Jun 2021**	**0082_MW147_210622**	**Normal**	**EP2107183**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW147	**22 Jun 2021**	**0082_QC107_210622**	**Field Duplicate**	**EP2107183**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW147	**22 Jun 2021**	**0082_QC207_210622**	**Interlab Duplicate**	**805490**	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
MW147	**22 Nov 2021**	**0082_MW147_211122**	**Normal**	**EP2114227**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW147	**20 Jun 2022**	**0082_MW147_220620**	**Normal**	**EP2207563**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW147	**21 Nov 2022**	**0082_MW147_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW147	**26 Jun 2023**	**0082_MW147_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW147	**26 Jun 2023**	**0082_QC101_230626**	**Field Duplicate**	**EP2308608**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW147	**26 Jun 2023**	**0082_QC201_230626**	**Interlab Duplicate**	**1004374**	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
MW148S	**21 Jun 2018**	**0082_MW148S_180621**	**Normal**	**212780**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.006
MW148S	**27 Nov 2019**	**0082_MW148S_191127**	**Normal**	**EP1912549**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW148S	**27 Nov 2019**	**0082_QC101_191127**	**Field Duplicate**	**EP1912549**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW148S	**27 Nov 2019**	**0082_QC201_191127**	**Interlab Duplicate**	**691496**	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
MW148S	**23 Jun 2020**	**0082_MW148S_200623**	**Normal**	**EP2006519**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01
MW148S	**23 Jun 2020**	**0082_QC104_200623**	**Field Duplicate**	**EP2006519**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW148S	**23 Jun 2020**	**0082_QC204_200623**	**Interlab Duplicate**	**728790**	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
MW148S	**17 Nov 2020**	**0082_MW148S_201117**	**Normal**	**EP2012748**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW148S	**21 Jun 2021**	**0082_MW148S_210621**	**Normal**	**EP2107033**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW148S	**22 Nov 2021**	**0082_MW148S_211122**	**Normal**	**EP2114227**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW148S	**20 Jun 2022**	**0082_MW148S_220620**	**Normal**	**EP2207563**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW148S	**21 Nov 2022**	**0082_MW148S_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW148S	**26 Jun 2023**	**0082_MW148S_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW151S	**21 Jun 2018**	**0082_MW151S_180621**	**Normal**	**212780**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW151S	**27 Nov 2019**	**0082_MW151S_191127**	**Normal**	**EP1912546**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW151S	**23 Jun 2020**	**0082_MW151S_200623**	**Normal**	**EP2006518**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW151S	**16 Nov 2020**	**0082_MW151_S_201116**	**Normal**	**EP2012737**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW151S	**21 Jun 2021**	**0082_MW151S_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW151S	**22 Nov 2021**	**0082_MW151S_211122**	**Normal**	**EP2114227**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW151S	**20 Jun 2022**	**0082_MW151S_220620**	**Normal**	**EP2207564**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW151S	**21 Nov 2022**	**0082_MW151S_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW151S	**26 Jun 2023**	**0082_MW151S_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW152S	**21 Jun 2018**	**0082_MW152S_180621**	**Normal**	**212780**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW152S	**27 Nov 2019**	**0082_MW152S_191127**	**Normal**	**EP1912546**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW152S	**27 Nov 2019**	**0082_QC105_191127**	**Field Duplicate**	**EP1912546**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW152S	**27 Nov 2019**	**0082_QC205_191127**	**Interlab Duplicate**	**691496**	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
MW152S	**23 Jun 2020**	**0082_MW152S_200623**	**Normal**	**EP2006518**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW152S	**16 Nov 2020**	**0082_MW152S_201116**	**Normal**	**EP2012669**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW152S	**22 Jun 2021**	**0082_MW152S_210622**	**Normal**	**EP2107092**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW152S	**22 Nov 2021**	**0082_MW152S_211122**	**Normal**	**EP2114227**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW152S	**20 Jun 2022**	**0082_MW152S_220620**	**Normal**	**EP2207564**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW152S	**21 Nov 2022**	**0082_MW152S_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW152S	**26 Jun 2023**	**0082_MW152S_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW153S	**22 Jun 2018**	**0082_MW153S_180622**	**Normal**	**212780**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW153S	**28 Nov 2019**	**0082_MW153S_191128**	**Normal**	**EP1912599**	<0.02	<0.02	<0.05	<0.05	0.29	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01

					PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							
				Perfluorobutane sulfonic acid (PFBS)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting				0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.001
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		**2**
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
MW153S	**23 Jun 2020**	**0082_MW153S_200623**	**Normal**	**EP2006518**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW153S	**16 Nov 2020**	**0082_MW153S_201116**	**Normal**	**EP2012669**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW153S	**22 Jun 2021**	**0082_MW153S_210622**	**Normal**	**EP2107086**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW153S	**23 Nov 2021**	**0082_MW153S_211123**	**Normal**	**EP2114294**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW153S	**20 Jun 2022**	**0082_MW153S_220620**	**Normal**	**EP2207564**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW153S	**21 Nov 2022**	**0082_MW153S_221121**	**Normal**	**EP2215715**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW153S	**26 Jun 2023**	**0082_MW153S_230626**	**Normal**	**EP2308608**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW154S	**20 Jun 2018**	**0082_MW154S_180620**	**Normal**	**212780**	0.071	<0.01	<0.05	<0.001	0.006	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.28
MW154S	**27 Nov 2019**	**0082_MW154S_191127**	**Normal**	**EP1912548**	0.07	<0.02	<0.05	<0.05	0.10	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.50
MW154S	**23 Jun 2020**	**0082_MW154S_200623**	**Normal**	**EP2006549**	0.12	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.94
MW154S	**16 Nov 2020**	**0082_MW154S_201116**	**Normal**	**EP2012669**	0.11	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.29
MW154S	**21 Jun 2021**	**0082_MW154S_210621**	**Normal**	**EP2107033**	0.13	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.07
MW154S	**22 Nov 2021**	**0082_MW154S_211122**	**Normal**	**EP2114227**	0.20	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.99
MW154S	**20 Jun 2022**	**0082_MW154S_220620**	**Normal**	**EP2207563**	0.23	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.90
MW154S	**21 Nov 2022**	**0082_MW154S_221121**	**Normal**	**EP2215715**	0.21	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.00
MW154S	**26 Jun 2023**	**0082_MW154S_230626**	**Normal**	**EP2308618**	0.21	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.72
MW155S	**22 Jun 2018**	**0082_MW155S_180622**	**Normal**	**212780**	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
MW155S	**27 Nov 2019**	**0082_MW155S_191127**	**Normal**	**EP1912548**	<0.02	<0.02	<0.05	<0.05	0.16	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW155S	**23 Jun 2020**	**0082_MW155S_200623**	**Normal**	**EP2006549**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW155S	**16 Nov 2020**	**0082_MW155S_201116**	**Normal**	**EP2012669**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW155S	**21 Jun 2021**	**0082_MW155S_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW155S	**22 Nov 2021**	**0082_MW155S_211122**	**Normal**	**EP2114226**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW155S	**20 Jun 2022**	**0082_MW155S_220620**	**Normal**	**EP2207565**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW155S	**21 Nov 2022**	**0082_MW155S_221121**	**Normal**	**EP2215643**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW155S	**26 Jun 2023**	**0082_MW155S_230626**	**Normal**	**EP2308618**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW310	**09 Mar 2018**	**0082_BDDBO20_180309**	**Normal**	**208025**	1.4	<0.01	<0.05	0.007	0.38	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	**6.7**
MW310	**18 Jun 2018**	**0082_B020_180618**	**Normal**	**212373**	1.7	<0.01	<0.05	0.009	0.44	0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	**7.4**
MW310	**27 Nov 2019**	**0082_B020_191127**	**Normal**	**EP1912547**	1.05	<0.02	<0.05	<0.05	0.56	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.83
MW310	**27 Nov 2019**	**0082_QC103_191127**	**Field Duplicate**	**EP1912547**	1.01	<0.02	<0.05	<0.05	0.49	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.75
MW310	**27 Nov 2019**	**0082_QC203_191127**	**Interlab Duplicate**	**691496**	0.97	<0.01	<0.01	<0.01	0.51	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	1.9
MW310	**23 Jun 2020**	**0082_MW310_200623**	**Normal**	**EP2006519**	1.71	<0.02	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**5.56**
MW310	**17 Nov 2020**	**0082_MW310_201117**	**Normal**	**EP2012739**	2.39	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**3.69**
MW310	**21 Jun 2021**	**0082_MW310_210621**	**Normal**	**EP2107028**	1.50	<0.02	<0.05	<0.05	0.44	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**15.7**
MW310	**22 Nov 2021**	**0082_MW310_211122**	**Normal**	**EP2114224**	7.46	<0.02	<0.05	<0.05	0.33	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**10.1**
MW310	**20 Jun 2022**	**0082_MW310_220620**	**Normal**	**EP2207565**	5.83	<0.02	<0.05	<0.05	0.50	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**43.4**
MW310	**21 Nov 2022**	**0082_MW310_221121**	**Normal**	**EP2215715**	4.25	<0.02	<0.05	<0.05	0.64	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**31.4**
MW310	**26 Jun 2023**	**0082_MW310_230626**	**Normal**	**EP2308618**	5.29	<0.02	<0.05	<0.05	0.58	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	**13.1**
MW311	**18 Jun 2018**	**0082_B021_180618**	**Normal**	**212373**	0.023	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.64
MW311	**27 Nov 2019**	**0082_B021_191127**	**Normal**	**EP1912547**	0.03	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.74
MW311	**23 Jun 2020**	**0082_MW311_200623**	**Normal**	**EP2006519**	0.04	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.94
MW311	**17 Nov 2020**	**0082_MW311_201117**	**Normal**	**EP2012739**	0.03	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.91
MW311	**21 Jun 2021**	**0082_MW311_210621**	**Normal**	**EP2107028**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.75
MW311	**22 Nov 2021**	**0082_MW311_211122**	**Normal**	**EP2114224**	0.03	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16
MW311	**22 Nov 2021**	**0082_QC105_211122**	**Field Duplicate**	**EP2114224**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.17
MW311	**22 Nov 2021**	**0082_QC205_211122**	**Interlab Duplicate**	**844500**	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.13
MW311	**20 Jun 2022**	**0082_MW311_220620**	**Normal**	**EP2207565**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.30
MW311	**20 Jun 2022**	**0082_QC105_220620**	**Field Duplicate**	**EP2207565**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.30
MW311	**20 Jun 2022**	**0082_QC205_220620**	**Interlab Duplicate**	**901186**	0.002	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.25
MW311	**21 Nov 2022**	**0082_MW311_221121**	**Normal**	**EP2215715**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.49
MW311	**21 Nov 2022**	**0082_QC105_221121**	**Field Duplicate**	**EP2215715**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.52
MW311	**21 Nov 2022**	**0082_QC205_221120**	**Interlab Duplicate**	**945158**	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.24
MW311	**26 Jun 2023**	**0082_MW311_230626**	**Normal**	**EP2308618**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.33
MW315	**22 Feb 2018**	**0082_BA1_180222**	**Normal**	**207359**	0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	
MW315	**10 Jun 2018**	**0082_BA1_180610**	**Normal**	**212095**	0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.002
MW315	**27 Nov 2019**	**0082_BA1_191127**	**Normal**	**EP1912547**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW315	**25 Jun 2020**	**0082_MW315_200625**	**Normal**	**EP2006593**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW315	**17 Nov 2020**	**0082_MW315_201117**	**Normal**	**EP2012738**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12
MW315	**21 Jun 2021**	**0082_MW315_210621**	**Normal**	**EP2107033**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW315	**22 Nov 2021**	**0082_MW315_211122**	**Normal**	**EP2114224**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW315	**20 Jun 2022**	**0082_MW315_220620**	**Normal**	**EP2207565**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW315	**20 Jun 2022**	**0082_QC103_220620**	**Field Duplicate**	**EP2207565**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW315	**20 Jun 2022**	**0082_QC203_220620**	**Interlab Duplicate**	**901186**	<0.002	<0.001	<0.001	<0.008	<0.008	<0.002	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.003
MW315	**21 Nov 2022**	**0082_MW315_221121**	**Normal**	**EP2215715**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW315	**21 Nov 2022**	**0082_QC107_221121**	**Field Duplicate**	**EP2215715**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW315	**21 Nov 2022**	**0082_QC207_221120**	**Interlab Duplicate**	**945158**	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.01

				PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							
	Perfluorobutane sulfonic acid (PFBS)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.001
PFAS NEMP 2020 Interim Marine 99%															
PFAS NEMP 2020 Recreational Water															**2**

Location Code	Date	Field ID	Sample Type	Lab Report Number													
MW315	26 Jun 2023	0082_MW315_230626	Normal	EP2308618	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW315	26 Jun 2023	0082_QC104_230626	Field Duplicate	EP2308618	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
MW315	26 Jun 2023	0082_QC204_230626	Interlab Duplicate	1004374	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
MW326	22 Feb 2018	0082_BB8_180222	Normal	207359	0.008	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	
MW326	21 Jun 2018	0082_BB8_180621	Normal	212780	0.008	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.013
MW326	28 Nov 2019	0082_BB8_191128	Normal	EP1912606	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03
MW326	28 Nov 2019	0082_QC101_191128	Field Duplicate	EP1912606	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02
MW326	28 Nov 2019	0082_QC201_191128	Interlab Duplicate	691486	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02
MW326	23 Jun 2020	0082_MW326_200623	Normal	EP2006519	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06
MW326	17 Nov 2020	0082_MW326_201117	Normal	EP2012738	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13
MW326	17 Nov 2020	0082_QC104_201117	Field Duplicate	EP2012738	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09
MW326	17 Nov 2020	0082_QC203_201117	Interlab Duplicate	758013	0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08
MW326	21 Jun 2021	0082_MW326_210621	Normal	EP2107028	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08
MW326	23 Nov 2021	0082_MW326_211123	Normal	EP2114295	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08
MW326	20 Jun 2022	0082_MW326_220620	Normal	EP2207563	0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15
MW326	21 Nov 2022	0082_MW326_221121	Normal	EP2215643	0.03	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12
MW326	26 Jun 2023	0082_MW326_230626	Normal	EP2308607	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08
MW326	26 Jun 2023	0082_QC102_230626	Field Duplicate	EP2308607	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08
MW326	26 Jun 2023	0082_QC202_230626	Interlab Duplicate	1004374	0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.06

First time detectionof PFOA or PFHxS+PFOS

New exceedance of guideline value

					PFAS			Inorganics										
					Perfluorobutane sulfonic acid (PFBS)	Sum of PFAS (WA DER List)	Sum of PFAS	Hardness	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Sulphate	Calcium
					µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.001	0.001	3	1	1	1	1	0.01	0.01	1	0.01	1	1	0.1
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																			
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**															
MW022	**21 Feb 2018**	**0082_MW22_180221**	**Normal**	**207287**	0.2			230		340					230	-0.76		78	
MW022	**09 Jun 2018**	**0082_MW22_180609**	**Normal**	**212095**	0.12			190		370					170	-0.046		65	
MW022	**27 Nov 2019**	**0082_MW22_191127**	**Normal**	**EP1912548**	0.10	7.25	7.64		<1	364	<1	364	11.8	11.2	117	2.72	60		
MW022	**27 Nov 2019**	**0082_QC104_191127**	**Field Duplicate**	**EP1912548**	0.10	7.43	7.83		<1	432	<1	432	13.5	11.7	123	6.90	66		
MW022	**27 Nov 2019**	**0082_QC204_191127**	**Interlab Duplicate**	**691496**	0.10	6.8	7.2		<10	1,300					120			67	51
MW022	**23 Jun 2020**	**0082_MW022_200623**	**Normal**	**EP2006549**	0.16	12.4	13.1		<1	402	<1	402	13.1	12.1	144	3.90	49		
MW022	**22 Jun 2021**	**0082_MW022_210622**	**Normal**	**EP2107092**	0.09	8.27	8.82		<1	381	<1	381	12.2	12.0	125	0.95	51		
MW022	**22 Nov 2021**	**0082_MW022_211122**	**Normal**	**EP2114224**	0.13	9.21	9.81		<1	357	<1	357	9.89	9.60	72	1.51	35		
MW022	**20 Jun 2022**	**0082_MW022_220620**	**Normal**	**EP2207563**	0.07	8.12	8.84		<1	374	<1	374	9.33	9.36	51	0.18	20		
MW022	**21 Nov 2022**	**0082_MW022_221121**	**Normal**	**EP2215715**	<0.02	3.34	3.62		<1	311	<1	311	6.90	6.03	14	6.71	14		
MW022	**26 Jun 2023**	**0082_MW022_230626**	**Normal**	**EP2308618**	0.03	5.05	5.29		<1	380	<1	380	9.01	8.12	40	5.18	14		
MW103D	**09 Mar 2018**	**0082_MW103D_180309**	**Normal**	**208025**	0.22			840		180					1,300	-2.3		180	
MW103D	**09 Mar 2018**	**0082_QC1404_180309**	**Field Duplicate**	**208025**	0.23			820		180					1,300	-2.7		180	
MW103D	**09 Jun 2018**	**0082_MW103D_180609**	**Normal**	**212095**	0.19			920		230					1,300	-0.49		170	
MW103D	**27 Nov 2019**	**0082_MW103D_191127**	**Normal**	**EP1912547**	0.26	12.4	12.9		<1	173	<1	173	41.8	43.5	1,230	1.99	177		
MW103D	**23 Jun 2020**	**0082_MW103D_200623**	**Normal**	**EP2006519**	0.31	7.93	8.55		<1	233	<1	233	57.8	57.1	1,760	0.63	170		
MW103D	**23 Jun 2020**	**0082_QC103_200623**	**Field Duplicate**	**EP2006519**	0.22	9.25	9.69		<1	238	<1	238	58.5	56.9	1,780	1.46	172		
MW103D	**23 Jun 2020**	**0082_QC203_200623**	**Interlab Duplicate**	**728790**	0.14	7.74	8.1		<10	1,000					1,700			170	230
MW103D	**17 Nov 2020**	**0082_MW103D_201117**	**Normal**	**EP2012738**	0.20	7.18	7.51		<1	227	<1	227	61.6	58.6	1,900	2.54	169		
MW103D	**21 Jun 2021**	**0082_MW103D_210621**	**Normal**	**EP2107028**	0.27	6.83	7.33		<1	245	<1	245	55.0	69.2	1,660	11.5	156		
MW103D	**21 Jun 2021**	**0082_QC104_210621**	**Field Duplicate**	**EP2107028**	0.26	6.99	7.48		<1	221	<1	221	61.9	65.7	1,930	2.96	147		
MW103D	**21 Jun 2021**	**0082_QC204_210621**	**Interlab Duplicate**	**805490**	0.26	7.02	7.53		<10	310	<20	310			2,000			180	230
MW103D	**23 Nov 2021**	**0082_MW103D_211123**	**Normal**	**EP2114295**	0.50	8.75	9.31		<1	177	<1	177	46.9	49.6	1,420	2.79	161		
MW103D	**20 Jun 2022**	**0082_MW103D_220620**	**Normal**	**EP2207565**	0.33	6.72	7.13		<1	163	<1	163	48.2	46.3	1,470	2.06	169		
MW103D	**21 Nov 2022**	**0082_MW103D_221121**	**Normal**	**EP2215715**	0.27	7.55	8.08		<1	177	<1	177	42.4	44.6	1,260	2.56	159		
MW103D	**26 Jun 2023**	**0082_MW103D_230626**	**Normal**	**EP2308618**	0.22	5.57	5.97		<1	141	<1	141	41.8	46.6	1,260	5.43	167		
MW105S	**09 Mar 2018**	**0082_MW105S_180309**	**Normal**	**208025**	0.055			250		460					390	-2.8		140	
MW105S	**04 Jun 2018**	**0082_MW105S_180604**	**Normal**	**211639**	0.057			230		460					270	-2.8		110	
MW105S	**27 Nov 2019**	**0082_MW105S_191127**	**Normal**	**EP1912547**	0.11	6.27	6.59		<1	426	<1	426	32.5	34.2	703	2.49	200		
MW105S	**21 Jun 2021**	**0082_MW105S_210621**	**Normal**	**EP2107028**	0.14	10.3	10.7		<1	813	<1	813	51.8	51.8	1,060	0.02	273		
MW105S	**23 Nov 2021**	**0082_MW105S_211123**	**Normal**	**EP2114293**	0.16	13.0	13.5		<1	670	<1	670	40.6	38.9	806	2.17	217		
MW105S	**20 Jun 2022**	**0082_MW105S_220620**	**Normal**	**EP2207565**	0.25	15.2	15.8		<1	1,250	<1	1,250	73.9	67.6	1,340	4.48	534		
MW105S	**21 Nov 2022**	**0082_MW105S_221121**	**Normal**	**EP2215643**	0.14	12.2	12.7		<1	1,390	<1	1,390	53.9	48.6	636	5.22	394		
MW105S	**26 Jun 2023**	**0082_MW105S_230626**	**Normal**	**EP2308607**	0.05	7.52	7.79		<1	859	<1	859	29.2	25.5	332	6.89	130		
MW108	**07 Mar 2018**	**0082_MW108_180307**	**Normal**	**208025**	0.009			580		470					3,300	-1.0		940	
MW108	**18 Jun 2018**	**0082_MW108_180618**	**Normal**	**212373**	0.008			550		510					3,300	-0.25		920	
MW108	**21 Nov 2022**	**0082_MW108_221121**	**Normal**	**EP2215643**	<0.02	0.14	0.14		<1	541	<1	541	112	111	2,940	0.19	866		
MW108	**26 Jun 2023**	**0082_MW108_230626**	**Normal**	**EP2308607**	<0.02	0.16	0.16		<1	563	<1	563	109	117	2,910	3.35	758		
MW113	**10 Mar 2018**	**0082_MW113_180310**	**Normal**	**208025**	0.026			190		420					680	-0.48		180	
MW113	**09 Jun 2018**	**0082_MW113_180609**	**Normal**	**212095**	0.026			180		620					650	-3.0		170	
MW113	**27 Nov 2019**	**0082_MW113_191127**	**Normal**	**EP1912547**	0.03	0.88	0.91		<1	534	<1	534	33.6	31.6	678	3.04	181		
MW113	**23 Jun 2020**	**0082_MW113_200623**	**Normal**	**EP2006519**	0.03	0.36	0.39		<1	564	<1	564	35.1	30.2	709	7.45	185		
MW113	**17 Nov 2020**	**0082_MW113_201117**	**Normal**	**EP2012738**	0.03	0.34	0.36		<1	522	<1	522	34.3	31.4	703	4.46	193		
MW113	**17 Nov 2020**	**0082_QC106_201117**	**Field Duplicate**	**EP2012738**	0.03	0.35	0.37		<1	579	<1	579	36.0	31.3	725	7.07	193		
MW113	**17 Nov 2020**	**0082_QC206_201117**	**Interlab Duplicate**	**758013**	0.02	0.45	0.47		<10	1,800	<20	1,800			800			220	15
MW113	**21 Jun 2021**	**0082_MW113_210621**	**Normal**	**EP2107028**	0.02	0.34	0.36		<1	543	<1	543	35.1	32.7	736	3.54	169		
MW113	**23 Nov 2021**	**0082_MW113_211123**	**Normal**	**EP2114293**	0.03	0.39	0.42		4	522	<1	525	33.5	31.8	703	2.62	151		
MW113	**23 Nov 2021**	**0082_QC107_211123**	**Field Duplicate**	**EP2114293**	0.04	0.39	0.42												
MW113	**23 Nov 2021**	**0082_QC207_211123**	**Interlab Duplicate**	**844500**	0.03	0.42	0.46												
MW113	**20 Jun 2022**	**0082_MW113_220620**	**Normal**	**EP2207565**	0.03	0.34	0.36		<1	542	<1	542	33.2	29.4	653	6.15	192		
MW113	**21 Nov 2022**	**0082_MW113_221121**	**Normal**	**EP2215715**	0.02	0.34	0.36		<1	613	<1	613	34.1	30.1	644	6.19	176		
MW113	**26 Jun 2023**	**0082_MW113_230626**	**Normal**	**EP2308618**	0.02	0.19	0.19		<1	653	<1	653	31.6	28.7	535	4.85	166		
MW115	**08 Mar 2018**	**0082_MW115_180308**	**Normal**	**208025**	0.008			840		220					1,500	-0.82		140	
MW115	**09 Jun 2018**	**0082_MW115_180609**	**Normal**	**212095**	0.009			850		280					1,500	0.021		140	
MW115	**27 Nov 2019**	**0082_MW115_191127**	**Normal**	**EP1912547**	0.15	22.6	22.9		<1	300	<1	300	48.4	52.6	1,320	4.26	246		
MW115	**23 Jun 2020**	**0082_MW115_200623**	**Normal**	**EP2006519**	0.26	28.8	29.5		<1	308	<1	308	48.7	47.9	1,330	0.79	242		
MW115	**17 Nov 2020**	**0082_MW115_201117**	**Normal**	**EP2012738**	0.17	29.3	29.8		<1	304	<1	304	52.8	50.7	1,440	2.06	294		
MW115	**21 Jun 2021**	**0082_MW115_210621**	**Normal**	**EP2107028**	0.17	27.3	27.8		<1	294	<1	294	47.7	47.2	1,310	0.57	234		
MW115	**22 Nov 2021**	**0082_MW115_211122**	**Normal**	**EP2114224**	0.33	40.7	41.5		<1	313	<1	313	47.7	49.7	1,250	2.06	299		
MW115	**22 Nov 2021**	**0082_QC106_211122**	**Field Duplicate**	**EP2114224**	0.30	36.9	37.5												
MW115	**22 Nov 2021**	**0082_QC206_211122**	**Interlab Duplicate**	**844500**	0.25	33.6	34.35												
MW115	**20 Jun 2022**	**0082_MW115_220620**	**Normal**	**EP2207565**	0.25	33.0	33.5		<1	309	<1	309	42.3	41.5	1,060	0.96	299		
MW115	**21 Nov 2022**	**0082_MW115_221121**	**Normal**	**EP2215715**	0.22	36.1	36.8		<1	389	<1	389	41.5	41.1	942	0.46	343		
MW115	**26 Jun 2023**	**0082_MW115_230626**	**Normal**	**EP2308618**	0.15	20.5	21.0												
MW118D	**05 Mar 2018**	**0082_MW118D_180305**	**Normal**	**207818**	1.2			160		600					790	-2.1		200	

				PFAS			Inorganics										
				Perfluorobutane sulfonic acid (PFBS)	Sum of PFAS (WA DER List)	Sum of PFAS	Hardness	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Sulphate	Calcium
				µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L
LOR - Limit of Reporting				0.001	0.001	0.001	3	1	1	1	1	0.01	0.01	1	0.01	1	1	0.1
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
MW118D	**09 Jun 2018**	**0082_MW118D_180609**	**Normal**	**212095**	0.82			170		560					660	-0.39		120	
MW118D	**09 Jun 2018**	**0082_QC156_180609**	**Field Duplicate**	**212095**	1.1			170		560					680	-0.68		120	
MW118D	**09 Jun 2018**	**0082_QC256_180609**	**Interlab Duplicate**	**604115**	1.2	59.27	61.46		<10	530		530			640			130	21
MW118D	**27 Nov 2019**	**0082_MW118D_191127**	**Normal**	**EP1912548**	0.90	50.8	52.8		<1	590	<1	590	36.8	35.4	782	1.92	140		
MW118D	**23 Jun 2020**	**0082_MW118D_200623**	**Normal**	**EP2006549**	0.82	40.8	42.4		<1	674	<1	674	44.9	42.8	976	2.32	187		
MW118D	**16 Nov 2020**	**0082_MW118D_201116**	**Normal**	**EP2012669**	0.83	41.8	43.3		<1	657	<1	657	45.0	42.3	982	3.15	202		
MW118D	**21 Jun 2021**	**0082_MW118D_210621**	**Normal**	**EP2107033**	0.70	37.3	38.8		<1	672	<1	672	65.0	64.3	1,630	0.56	271		
MW118D	**22 Nov 2021**	**0082_MW118D_211122**	**Normal**	**EP2114224**	0.66	32.6	33.6		<1	633	<1	633	44.4	46.1	988	1.89	185		
MW118D	**20 Jun 2022**	**0082_MW118D_220620**	**Normal**	**EP2207563**	0.45	26.5	27.5		<1	608	<1	608	42.2	39.9	935	2.78	176		
MW118D	**21 Nov 2022**	**0082_MW118D_221121**	**Normal**	**EP2215715**	0.30	21.0	21.8		14	532	<1	546	39.4	39.1	906	0.33	141		
MW118D	**26 Jun 2023**	**0082_MW118D_230626**	**Normal**	**EP2308618**	0.32	17.9	18.6		<1	548	<1	548	41.0	42.3	956	1.59	148		
MW122	**05 Mar 2018**	**0082_MW122_180305**	**Normal**	**207818**	0.21			380		580					2,500	-2.3		810	
MW122	**16 Jun 2018**	**0082_MW122_180616**	**Normal**	**212373**	0.24			350		700					2,200	-4		760	
MW122	**27 Nov 2019**	**0082_MW122_191127**	**Normal**	**EP1912549**	0.28	5.67	6.03		<1	773	<1	773	98.1	91.0	2,460	3.77	638		
MW122	**23 Jun 2020**	**0082_MW122_200623**	**Normal**	**EP2006549**	0.34	7.01	7.53		<1	820	<1	820	95.2	90.4	2,380	2.58	562		
MW122	**16 Nov 2020**	**0082_MW122_201116**	**Normal**	**EP2012669**	0.15	3.38	3.61		<1	700	<1	700	90.1	83.6	2,260	3.77	596		
MW122	**22 Jun 2021**	**0082_MW122_210622**	**Normal**	**EP2107092**	0.15	2.98	3.17		<1	687	<1	687	89.6	85.5	2,230	2.34	624		
MW122	**23 Nov 2021**	**0082_MW122_211123**	**Normal**	**EP2114295**	0.29	6.23	6.55		<1	757	<1	757	85.6	85.1	2,060	0.30	593		
MW122	**20 Jun 2022**	**0082_MW122_220620**	**Normal**	**EP2207565**	0.24	4.64	4.91		<1	709	<1	709	85.6	79.7	2,110	3.54	570		
MW122	**26 Jun 2023**	**0082_MW122_230626**	**Normal**	**EP2308607**	0.12	1.95	2.12		<1	722	<1	722	87.1	97.1	2,130	5.43	603		
MW126	**05 Mar 2018**	**0082_MW126_180305**	**Normal**	**207818**	0.011			160		160					220	0.068		68	
MW126	**16 Jun 2018**	**0082_MW126_180616**	**Normal**	**212373**	0.006			160		160					67	1.9		43	
MW126	**27 Nov 2019**	**0082_MW126_191127**	**Normal**	**EP1912546**	0.08	2.79	2.96		<1	405	<1	405	30.3	28.5	649	3.05	186		
MW126	**23 Jun 2020**	**0082_MW126_200623**	**Normal**	**EP2006549**	0.08	2.72	2.90		<1	385	<1	385	49.1	46.1	1,330	3.16	187		
MW126	**21 Jun 2021**	**0082_MW126_210621**	**Normal**	**EP2107033**	0.06	4.56	4.73		<1	409	<1	409	24.7	26.2	505	2.91	109		
MW126	**22 Nov 2021**	**0082_MW126_211122**	**Normal**	**EP2114226**	0.03	3.07	3.09		<1	289	<1	289	10.5	8.97	130	7.86	51		
MW126	**20 Jun 2022**	**0082_MW126_220620**	**Normal**	**EP2207564**	0.14	5.72	5.99		<1	444	<1	444	28.2	24.6	578	6.90	146		
MW126	**21 Nov 2022**	**0082_MW126_221121**	**Normal**	**EP2215715**	<0.02	2.85	2.87		<1	209	<1	209	8.39	7.82	111	3.50	52		
MW126	**26 Jun 2023**	**0082_MW126_230626**	**Normal**	**EP2308607**	<0.02	3.15	3.17		<1	372	<1	372	12.0	12.1	120	0.66	56		
MW128	**05 Mar 2018**	**0082_MW128_4.2_180305**	**Normal**	**207818**	<0.001			7,100		210					21,000	3.2		3,500	
MW128	**05 Mar 2018**	**0082_MW128_6.2_180305**	**Normal**	**207818**	<0.001			7,000		220					20,000	4.5		3,400	
MW128	**05 Mar 2018**	**0082_MW128_8.2_180305**	**Normal**	**207818**	<0.001			7,000		190					21,000	1.5		3,600	
MW128	**15 Jun 2018**	**0082_MW128_3.7-4.2_180615**	**Normal**	**212373**	<0.001			6,700		240					20,000	2.6		2,900	
MW128	**15 Jun 2018**	**0082_MW128_5.7-6.2_180615**	**Normal**	**212373**	<0.001			6,400		200					20,000	0.68		2,800	
MW128	**15 Jun 2018**	**0082_MW128_7.7-8.2_180615**	**Normal**	**212373**	<0.001			6,700		180					21,000	1		2,800	
MW128	**27 Nov 2019**	**0082_MW128_3.7-4.2_191127**	**Normal**	**EP1912546**	<0.02	<0.01	<0.01		<1	105	<1	105	628	740	20,000	8.21	2,970		
MW128	**23 Jun 2020**	**0082_MW128_200623**	**Normal**	**EP2006518**	<0.02	<0.01	<0.01		<1	183	<1	183	624	696	19,900	5.49	2,830		
MW128	**16 Nov 2020**	**0082_MW128_201116**	**Normal**	**EP2012670**	<0.05	<0.05	<0.05		<1	185	<1	185	625	702	19,800	5.79	3,030		
MW128	**21 Jun 2021**	**0082_MW128_3.7-4.2_210621**	**Normal**	**EP2107024**	<0.02	<0.01	<0.01		<1	220	<1	220	607	722	19,500	8.66	2,540		
MW128	**22 Nov 2021**	**0082_MW128_3.7-4.2_211122**	**Normal**	**EP2114224**	<0.02	<0.01	<0.01		<1	137	<1	137	605	717	19,400	8.47	2,660		
MW128	**20 Jun 2022**	**0082_MW128_220620**	**Normal**	**EP2207565**	0.02	0.05	0.05		<1	194	<1	194	596	663	18,900	5.30	2,830		
MW128	**20 Nov 2022**	**0082_MW128_3.7-4.2_221120**	**Normal**	**EP2215643**	<0.02	<0.01	<0.01		<1	156	<1	156	586	663	18,600	6.21	2,780		
MW128	**26 Jun 2023**	**0082_MW128_3.7-4.2_230626**	**Normal**	**EP2308607**	<0.02	<0.01	<0.01		<1	243	<1	243	589	689	18,600	7.79	2,870		
MW129	**05 Mar 2018**	**0082_MW129_3.5-4.0_180305**	**Normal**	**207818**	<0.001			7,100		170					21,000	3.3		3,500	
MW129	**05 Mar 2018**	**0082_MW129_5.5-6.0_180305**	**Normal**	**207818**	<0.001			7,000		150					21,000	1		3,700	
MW129	**05 Mar 2018**	**0082_MW129_7.5-8.0_180305**	**Normal**	**207818**	<0.001			7,300		130					21,000	2.9		3,700	
MW129	**21 Jun 2018**	**0082_MW129_3.5-4.0_180621**	**Normal**	**212780**	<0.001		<0.001	6,400		170					22,000	-1.9		2,800	
MW129	**21 Jun 2018**	**0082_MW129_5.5-6.0_180621**	**Normal**	**212780**	<0.001		<0.001	6,300		160					22,000	-2.9		2,800	
MW129	**21 Jun 2018**	**0082_MW129_7.5-8.0_180621**	**Normal**	**212780**	<0.001		<0.001	6,700		130					22,000	-1.1		2,900	
MW129	**27 Nov 2019**	**0082_MW129_3.5-4.0_191127**	**Normal**	**EP1912546**	<0.02	<0.01	<0.01		<1	142	<1	142	561	723	17,800	12.6	2,710		
MW129	**23 Jun 2020**	**0082_MW129_200623**	**Normal**	**EP2006518**	<0.02	<0.01	<0.01		<1	166	<1	166	623	671	19,900	3.71	2,800		
MW129	**16 Nov 2020**	**0082_MW129_201116**	**Normal**	**EP2012737**	<0.02	<0.01	<0.01		<1	156	<1	156	644	698	20,700	3.96	2,760		
MW129	**21 Jun 2021**	**0082_MW129_3.5-4.0_210621**	**Normal**	**EP2107024**	<0.02	<0.01	<0.01		<1	157	<1	157	603	696	19,400	7.17	2,520		
MW129	**22 Nov 2021**	**0082_MW129_3.5-4_211122**	**Normal**	**EP2114226**	<0.02	<0.01	<0.01		<1	159	<1	159	618	664	19,700	3.64	2,820		
MW129	**20 Jun 2022**	**0082_MW129_3.5-4_220620**	**Normal**	**EP2207564**	<0.02	<0.01	<0.01		<1	186	<1	186	617	689	19,600	5.51	2,920		
MW129	**20 Jun 2022**	**0082_QC106_220620**	**Field Duplicate**	**EP2207564**	<0.02	<0.01	<0.01		<1	193	<1	193	635	724	20,200	6.55	2,930		
MW129	**20 Jun 2022**	**0082_QC206_220620**	**Interlab Duplicate**	**901186**	<0.002	0.077	0.077												
MW129	**20 Nov 2022**	**0082_MW129_3.5-4.0_221120**	**Normal**	**EP2215643**	<0.02	<0.01	<0.01		<1	156	<1	156	586	676	18,600	7.10	2,800		
MW129	**26 Jun 2023**	**0082_MW129_3.5-4.0_230626**	**Normal**	**EP2308608**	<0.02	<0.01	<0.01		<1	145	<1	145	552	651	17,600	8.25	2,520		
MW130	**05 Mar 2018**	**0082_MW130_2.8-3.3_180305**	**Normal**	**207818**	<0.001			3,900		400					13,000	0.86		2,200	
MW130	**05 Mar 2018**	**0082_MW130_4.8-5.3_180305**	**Normal**	**207818**	<0.001			5,200		220					15,000	4.4		2,600	
MW130	**05 Mar 2018**	**0082_MW130_6.8-7.3_180305**	**Normal**	**207818**	<0.001			6,500		240					15,000	14		2,700	
MW130	**20 Jun 2018**	**0082_MW130_4.8-5.3_180620**	**Normal**	**212780**	0.002		0.25	6,700		210					18,000	9.0		2,400	
MW130	**20 Jun 2018**	**0082_MW130_6.8-7.3_180620**	**Normal**	**212780**	<0.001		0.012	7,200		190					19,000	11		2,400	
MW130	**20 Jun 2018**	**0082_QC272_180620**	**Interlab Duplicate**	**605980**	<0.01	0.38	0.38		<10	1,300		1,300			17,000			2,200	560

				PFAS			Inorganics										
				Perfluorobutane sulfonic acid (PFBS)	Sum of PFAS (WA DER List)	Sum of PFAS	Hardness	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Sulphate	Calcium
				µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L
LOR - Limit of Reporting				0.001	0.001	0.001	3	1	1	1	1	0.01	0.01	1	0.01	1	1	0.1
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
MW130	**23 Jun 2018**	**0082_MW130_2.8-3.3_180623**	**Normal**	**212780**	<0.001		0.013	2,700		380					9,100	0.43		1,100	
MW130	**23 Jun 2020**	**0082_MW130_200623**	**Normal**	**EP2006518**	<0.02	<0.01	<0.01		<1	160	<1	160	589	617	18,900	2.28	2,550		
MW130	**16 Nov 2020**	**0082_MW130_201116**	**Normal**	**EP2012737**	<0.02	0.02	0.02		<1	186	<1	186	616	634	19,800	1.50	2,570		
MW130	**21 Jun 2021**	**0082_MW130_6.9-7.4_210621**	**Normal**	**EP2107024**	<0.02	0.02	0.02		<1	185	<1	185	559	649	18,000	7.44	2,280		
MW130	**22 Nov 2021**	**0082_MW130_211122**	**Normal**	**EP2114226**	<0.02	<0.01	<0.01		<1	175	<1	175	583	615	18,600	2.67	2,620		
MW130	**20 Jun 2022**	**0082_MW130_2.9-3.4_220620**	**Normal**	**EP2207564**	<0.02	<0.01	<0.01		<1	164	<1	164	577	630	18,400	4.43	2,610		
MW130	**20 Nov 2022**	**0082_MW130_2.9-3.4_221120**	**Normal**	**EP2215643**	<0.02	<0.01	<0.01		<1	175	<1	175	545	602	17,300	4.98	2,560		
MW130	**26 Jun 2023**	**0082_MW130_4.9-5.4_230626**	**Normal**	**EP2308608**	<0.02	<0.01	<0.01		<1	259	<1	259	340	392	10,700	7.22	1,570		
MW131	**10 Mar 2018**	**0082_MW131_2.0-2.5_180310**	**Normal**	**208025**	0.001			1,100		800					3,600	-1.1		450	
MW131	**10 Mar 2018**	**0082_MW131_4.0-4.5_180310**	**Normal**	**208025**	<0.050			4,700		320					16,000	-1.1		2,700	
MW131	**10 Mar 2018**	**0082_MW131_6.0-6.5_180310**	**Normal**	**208025**	<0.001			5,400		180					19,000	-6.4		2,700	
MW131	**10 Mar 2018**	**0082_MW131_8.0-8.5_180310**	**Normal**	**208025**	<0.001			6,100		170					20,000	-1.1		2,600	
MW131	**20 Jun 2018**	**0082_MW131_2.0-2.5_180620**	**Normal**	**212570**	<0.001			1,300		700					4,600	2.3		680	
MW131	**20 Jun 2018**	**0082_MW131_4.0-4.5_180620**	**Normal**	**212570**	0.001			5,700		330					17,000	2.1		2,500	
MW131	**20 Jun 2018**	**0082_MW131_6.0-6.5_180620**	**Normal**	**212570**	<0.001			6,600		200					19,000	5.6		2,600	
MW131	**20 Jun 2018**	**0082_MW131_8.0-8.5_180620**	**Normal**	**212570**	<0.001			6,600		170					19,000	4.9		2,900	
MW131	**28 Nov 2019**	**0082_MW131_4.0-4.5_191128**	**Normal**	**EP1912609**	<0.02	<0.01	<0.01		<1	273	<1	273	507	574	16,000	6.15	2,420		
MW131	**23 Jun 2020**	**0082_MW131_200623**	**Normal**	**EP2006518**	<0.02	<0.01	<0.01		<1	291	<1	291	523	547	16,600	2.22	2,350		
MW131	**16 Nov 2020**	**0082_MW131_201116**	**Normal**	**EP2012737**	<0.02	0.08	0.08		<1	266	<1	266	554	591	17,700	3.26	2,370		
MW131	**21 Jun 2021**	**0082_MW131_4.0-4.5_210621**	**Normal**	**EP2107024**	<0.02	<0.01	<0.01		32	188	<1	220	14.5	12.7	275	6.59	115		
MW131	**22 Nov 2021**	**0082_MW131_211122**	**Normal**	**EP2114226**	<0.02	<0.01	<0.01		<1	223	<1	223	43.8	42.8	1,250	1.10	196		
MW131	**20 Jun 2022**	**0082_MW131_2-2.5_220620**	**Normal**	**EP2207564**	<0.02	<0.01	<0.01		<1	495	<1	495	24.6	22.2	448	5.12	98		
MW131	**20 Nov 2022**	**0082_MW131_4.0-4.5_221120**	**Normal**	**EP2215643**	<0.02	<0.01	<0.01		<1	254	<1	254	32.9	32.2	943	1.13	60		
MW131	**26 Jun 2023**	**0082_MW131_4.0-4.5_230626**	**Normal**	**EP2308607**	<0.02	<0.01	<0.01		<1	374	<1	374	140	161	4,290	7.16	535		
MW132	**10 Mar 2018**	**0082_MW132_6.4-6.9_180310**	**Normal**	**208025**	0.015			5,800		210					18,000	0.021		2,400	
MW132	**10 Mar 2018**	**0082_MW132_8.5-9.0_180310**	**Normal**	**208025**	0.003			6,100		240					19,000	-1.2		2,600	
MW132	**21 Jun 2018**	**0082_MW132_6.4-6.9_180621**	**Normal**	**212780**	0.018		0.11	6,000		230					18,000	1.8		2,400	
MW132	**21 Jun 2018**	**0082_MW132_8.5-9.0_180621**	**Normal**	**212780**	0.002		0.013	6,400		180					20,000	1.2		2,600	
MW132	**27 Nov 2019**	**0082_MW132_6.4-6.9_191127**	**Normal**	**EP1912546**	0.02	0.07	0.07		<1	231	<1	231	512	586	16,300	6.77	2,280		
MW132	**23 Jun 2020**	**0082_MW132_200623**	**Normal**	**EP2006549**	<0.02	0.05	0.07		<1	207	<1	207	538	591	17,200	4.69	2,340		
MW132	**16 Nov 2020**	**0082_MW132_201116**	**Normal**	**EP2012670**	<0.02	0.04	0.04		<1	202	<1	202	537	580	17,000	3.82	2,560		
MW132	**21 Jun 2021**	**0082_MW132_8.5-9.0_210621**	**Normal**	**EP2107024**	<0.02	<0.01	<0.01		<1	166	<1	166	553	628	17,800	6.37	2,280		
MW132	**22 Nov 2021**	**0082_MW132_6.4-6.9_211122**	**Normal**	**EP2114224**	<0.02	<0.01	<0.01		<1	180	<1	180	542	631	17,400	7.62	2,270		
MW132	**20 Jun 2022**	**0082_MW132_6.4-6.9_220620**	**Normal**	**EP2207564**	0.04	0.23	0.26		<1	230	<1	230	498	532	15,800	3.34	2,270		
MW132	**21 Nov 2022**	**0082_MW132_6.4-6.9_221121**	**Normal**	**EP2215643**	0.04	0.35	0.35		<1	274	<1	274	467	507	14,700	4.08	2,250		
MW132	**26 Jun 2023**	**0082_MW132_6.4-6.9_230626**	**Normal**	**EP2308608**	0.03	0.15	0.18		<1	250	<1	250	429	519	13,500	9.48	2,090		
MW133	**10 Mar 2018**	**0082_MW133_3.0-3.5_180310**	**Normal**	**208025**	0.002			5,300		340					16,000	0.95		2,300	
MW133	**10 Mar 2018**	**0082_MW133_5.0-5.5_180310**	**Normal**	**208025**	0.002			5,500		300					18,000	-1.5		2,700	
MW133	**10 Mar 2018**	**0082_MW133_7.0-7.5_180310**	**Normal**	**208025**	0.002			6,000		280					20,000	-2.0		2,800	
MW133	**10 Mar 2018**	**0082_QC1405_180310**	**Field Duplicate**	**208025**	<0.01			6,200		280					20,000	-0.73		2,800	
MW133	**21 Jun 2018**	**0082_MW133_3.0-3.5_180621**	**Normal**	**212780**	0.001		0.047	5,100		320					17,000	0.84		2,300	
MW133	**21 Jun 2018**	**0082_MW133_5.0-5.5_180621**	**Normal**	**212780**	0.002		0.072	5,300		310					19,000	-2.5		2,600	
MW133	**21 Jun 2018**	**0082_MW133_7.0-7.5_180621**	**Normal**	**212780**	0.002		0.044	6,100		310					21,000	-1.2		2,800	
MW133	**27 Nov 2019**	**0082_MW133_3.0-3.5_191127**	**Normal**	**EP1912548**	<0.02	0.51	0.51		<1	332	<1	332	508	666	15,800	13.5	2,660		
MW133	**23 Jun 2020**	**0082_MW133_200623**	**Normal**	**EP2006549**	<0.02	0.03	0.03		<1	324	<1	324	541	583	17,200	3.74	2,370		
MW133	**16 Nov 2020**	**0082_MW133_201116**	**Normal**	**EP2012737**	<0.02	0.06	0.06		<1	303	<1	303	555	611	17,700	4.77	2,390		
MW133	**21 Jun 2021**	**0082_MW133_3.0-3.5_210621**	**Normal**	**EP2107024**	<0.02	<0.01	<0.01		<1	116	<1	116	11.9	9.44	315	11.6	35		
MW133	**22 Nov 2021**	**0082_MW133_3-3.5_211122**	**Normal**	**EP2114224**	<0.02	<0.01	<0.01		<1	193	<1	193	215	247	6,780	6.79	975		
MW133	**20 Jun 2022**	**0082_MW133_220620**	**Normal**	**EP2207564**	<0.02	0.02	0.02		<1	300	<1	300	526	562	16,700	3.23	2,370		
MW133	**21 Nov 2022**	**0082_MW133_3-3.5_221121**	**Normal**	**EP2215643**	<0.02	0.05	0.05		<1	298	<1	298	499	557	15,700	5.50	2,420		
MW133	**26 Jun 2023**	**0082_MW133_3.0-3.5_230626**	**Normal**	**EP2308618**	<0.02	0.03	0.03		<1	346	<1	346	506	581	16,000	6.92	2,270		
MW134	**09 Mar 2018**	**0082_MW134_6.6-7.1_180309**	**Normal**	**208025**	<0.01			4,500		310					15,000	-2.5		1,900	
MW134	**09 Mar 2018**	**0082_MW134_8.6-9.1_180309**	**Normal**	**208025**	<0.001			4,700		310					15,000	-0.90		2,000	
MW134	**22 Jun 2018**	**0082_MW134_6.6-7.1_180622**	**Normal**	**212780**	<0.001		<0.001	4,700		330					15,000	0.61		1,800	
MW134	**22 Jun 2018**	**0082_MW134_8.6-9.1_180622**	**Normal**	**212780**	<0.001		0.004	4,500		330					15,000	0.74		1,900	
MW134	**27 Nov 2019**	**0082_MW134D_191127**	**Normal**	**EP1912549**	<0.02	<0.01	<0.01		<1	372	<1	372	470	498	15,000	2.92	1,900		
MW134	**23 Jun 2020**	**0082_MW134_6.6_200623**	**Normal**	**EP2006519**	<0.02	<0.01	<0.01		<1	328	<1	328	482	512	15,500	2.99	1,830		
MW134	**17 Nov 2020**	**0082_MW134_201117**	**Normal**	**EP2012748**	<0.02	<0.01	<0.01		<1	303	<1	303	476	491	15,300	1.54	1,860		
MW134	**17 Nov 2020**	**0082_QC105_201117**	**Field Duplicate**	**EP2012748**	<0.02	<0.01	<0.01		<1	329	<1	329	472	487	15,100	1.61	1,880		
MW134	**17 Nov 2020**	**0082_QC205_201117**	**Interlab Duplicate**	**758013**	<0.01	0.17	0.18		<10	410	<20	410			16,000			2,100	420
MW134	**21 Jun 2021**	**0082_MW134_210621**	**Normal**	**EP2107033**	<0.02	<0.01	<0.01		<1	312	<1	312	429	514	13,800	8.94	1,630		
MW134	**22 Nov 2021**	**0082_MW134_211122**	**Normal**	**EP2114227**	<0.02	<0.01	<0.01		<1	320	<1	320	473	454	15,200	2.10	1,840		
MW134	**20 Jun 2022**	**0082_MW134_6.6-7.1_220620**	**Normal**	**EP2207563**	<0.02	<0.01	<0.01		<1	304	<1	304	458	481	14,700	2.41	1,810		
MW134	**21 Nov 2022**	**0082_MW134_6.6-7.1_221121**	**Normal**	**EP2215643**	<0.02	<0.01	<0.01		<1	276	<1	276	419	464	13,400	5.08	1,700		
MW134	**26 Jun 2023**	**0082_MW134_6.6-7.1_230626**	**Normal**	**EP2308608**	<0.02	<0.01	<0.01		<1	342	<1	342	451	476	14,400	2.66	1,840		

				PFAS			Inorganics										
				Perfluorobutane sulfonic acid (PFBS)	Sum of PFAS (WA DER List)	Sum of PFAS	Hardness	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Sulphate	Calcium
				µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L
LOR - Limit of Reporting				0.001	0.001	0.001	3	1	1	1	1	0.01	0.01	1	0.01	1	1	0.1
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
MW135	**09 Mar 2018**	**0082_MW135_8.3-8.8_180309**	**Normal**	**208025**	<0.01													
MW135	**09 Mar 2018**	**0082_MW135_10.3-10.8_180309**	**Normal**	**208025**	<0.001			1,600		470				6,400	-1.7		2,100	
MW135	**22 Jun 2018**	**0082_MW135_8.3-8.8_180622**	**Normal**	**212780**	<0.001		0.020	1,500		510				6,300	0.86		2,100	
MW135	**22 Jun 2018**	**0082_MW135_10.3-10.8_180622**	**Normal**	**212780**	<0.001		0.017	1,500		540				6,500	-4.2		2,100	
MW135	**27 Nov 2019**	**0082_MW135_191127**	**Normal**	**EP1912547**	<0.02	<0.01	<0.01		<1	663	<1	663	268	314	7,040	7.88	2,690		
MW135	**17 Nov 2020**	**0082_MW135_201117**	**Normal**	**EP2012748**	<0.02	<0.01	<0.01		<1	623	<1	623	284	278	7,720	1.07	2,580		
MW135	**21 Jun 2021**	**0082_MW135_210621**	**Normal**	**EP2107028**	<0.02	<0.01	<0.01		<1	587	<1	587	252	271	7,000	3.50	2,080		
MW135	**23 Nov 2021**	**0082_MW135_8.3-8.8_211123**	**Normal**	**EP2114294**	<0.02	<0.01	<0.01		<1	573	<1	573	257	241	6,970	3.24	2,370		
MW135	**20 Jun 2022**	**0082_MW135_10.3-10.8_220620**	**Normal**	**EP2207563**	<0.02	<0.01	<0.01		<1	609	<1	609	258	231	7,280	5.58	1,970		
MW135	**21 Nov 2022**	**0082_MW135_10.3-10.8_221121**	**Normal**	**EP2215643**	<0.02	<0.01	<0.01		<1	612	<1	612	217	236	5,750	4.19	2,050		
MW135	**26 Jun 2023**	**0082_MW135_10.3-10.8_230626**	**Normal**	**EP2308608**	<0.02	<0.01	<0.01		<1	622	<1	622	207	245	5,370	8.34	2,070		
MW137	**09 Mar 2018**	**0082_MW137_6.1-6.6_180309**	**Normal**	**208025**	<0.01			2,300		490				6,700	-1.8		940	
MW137	**09 Mar 2018**	**0082_MW137_8.1-8.6_180309**	**Normal**	**208025**	<0.01			2,900		400				8,600	-0.80		1,200	
MW137	**09 Mar 2018**	**0082_MW137_10.1-10.6_180309**	**Normal**	**208025**	<0.001			4,300		310				13,000	-1.7		1,600	
MW137	**21 Jun 2018**	**0082_QC276_180622**	**Interlab Duplicate**	**605977**	<0.01	<0.05	<0.1		<10	2,200		2,200			7,400			1,100	450
MW137	**22 Jun 2018**	**0082_MW137_6.0-6.6_180622**	**Normal**	**212780**	<0.001		0.001	2,200		490					6,400	1.1		1,000	
MW137	**22 Jun 2018**	**0082_MW137_8.1-8.6_180622**	**Normal**	**212780**	<0.001		0.017	2,800		450					8,000	3.2		1,100	
MW137	**22 Jun 2018**	**0082_MW137_10.1-10.6_180622**	**Normal**	**212780**	<0.001		0.009	4,800		310					13,000	5.6		1,600	
MW137	**22 Jun 2018**	**0082_QC176_180622**	**Field Duplicate**	**212780**	<0.001		0.017	2,800		450					8,800	-0.28		1,200	
MW137	**27 Nov 2019**	**0082_MW137_6.1-6.6_191127**	**Normal**	**EP1912548**	<0.02	0.27	0.27		<1	449	<1	449	212	204	6,600	2.05	828		
MW137	**23 Jun 2020**	**0082_MW137_200623**	**Normal**	**EP2006549**	<0.02	<0.01	<0.01		<1	469	<1	469	216	221	6,730	0.99	822		
MW137	**16 Nov 2020**	**0082_MW137_6.6_201116**	**Normal**	**EP2012669**	<0.02	<0.01	<0.01		<1	450	<1	450	222	212	7,000	2.34	760		
MW137	**21 Jun 2021**	**0082_MW137_8.1-8.6_210621**	**Normal**	**EP2107024**	<0.02	<0.01	<0.01		<1	373	<1	373	218	213	6,780	1.14	913		
MW137	**22 Nov 2021**	**0082_MW137_211122**	**Normal**	**EP2114226**	<0.02	<0.01	<0.01		<1	298	<1	298	216	204	6,810	2.87	873		
MW137	**20 Jun 2022**	**0082_MW137_220620**	**Normal**	**EP2207565**	<0.02	<0.01	<0.01		<1	418	<1	418	211	193	6,620	4.41	778		
MW137	**21 Nov 2022**	**0082_MW137_6.1-6.6_221121**	**Normal**	**EP2215643**	<0.02	<0.01	<0.01		<1	296	<1	296	208	211	6,510	0.76	867		
MW137	**26 Jun 2023**	**0082_MW137_6.1-6.6_230626**	**Normal**	**EP2308618**	<0.02	1.28	1.28		<1	442	<1	442	204	219	6,320	3.70	794		
MW142	**22 Jun 2018**	**0082_MW142_180622**	**Normal**	**212780**	0.042		19	580		380					870	-1.8		100	
MW142	**27 Nov 2019**	**0082_MW142_191127**	**Normal**	**EP1912547**	0.04	12.0	12.2		<1	399	<1	399	40.4	41.0	1,050	0.70	135		
MW142	**23 Jun 2020**	**0082_MW142_200623**	**Normal**	**EP2006519**	0.08	11.7	12.0		<1	377	<1	377	47.4	46.0	1,300	1.42	152		
MW142	**17 Nov 2020**	**0082_MW142_201117**	**Normal**	**EP2012739**	0.03	8.89	9.00		<1	358	<1	358	47.5	47.3	1,320	0.23	149		
MW142	**21 Jun 2021**	**0082_MW142_210621**	**Normal**	**EP2107028**	0.42	68.7	70.4		<1	303	<1	303	53.7	53.9	1,600	0.22	121		
MW142	**21 Jun 2021**	**0082_QC103_210621**	**Field Duplicate**	**EP2107028**	0.24	39.3	40.1		<1	348	<1	348	55.6	56.4	1,610	0.65	157		
MW142	**21 Jun 2021**	**0082_QC203_210621**	**Interlab Duplicate**	**805490**	0.46	82.06	86.37		<10	600	<20	600			1,500			200	140
MW142	**22 Nov 2021**	**0082_MW142_211122**	**Normal**	**EP2114224**	0.06	11.6	11.8		<1	352	<1	352	51.8	57.5	1,460	5.24	172		
MW142	**22 Nov 2021**	**0082_QC104_211122**	**Field Duplicate**	**EP2114224**	0.06	10.6	10.8												
MW142	**22 Nov 2021**	**0082_QC204_211122**	**Interlab Duplicate**	**844500**	0.05	8.66	8.88												
MW142	**20 Jun 2022**	**0082_MW142_220620**	**Normal**	**EP2207565**	0.63	88.8	89.9		<1	274	<1	274	64.0	62.2	1,950	1.46	170		
MW142	**20 Jun 2022**	**0082_QC104_220620**	**Field Duplicate**	**EP2207565**	0.64	92.5	93.6		<1	288	<1	288	63.8	61.5	1,930	1.86	173		
MW142	**20 Jun 2022**	**0082_QC204_220620**	**Interlab Duplicate**	**901186**	0.12	8.4	8.6												
MW142	**21 Nov 2022**	**0082_MW142_221121**	**Normal**	**EP2215715**	0.16	31.0	31.5		<1	361	<1	361	51.1	55.1	1,410	3.73	199		
MW142	**26 Jun 2023**	**0082_MW142_230626**	**Normal**	**EP2308618**	0.07	12.7	12.9		<1	436	<1	436	53.5	57.2	1,430	3.34	216		
MW142	**26 Jun 2023**	**0082_QC103_230626**	**Field Duplicate**	**EP2308618**	0.06	15.3	15.5		<1	410	<1	410	53.6	59.0	1,450	4.82	215		
MW142	**26 Jun 2023**	**0082_QC203_230626**	**Interlab Duplicate**	**1004374**	0.04	16.46	16.75												
MW143	**23 Jun 2018**	**0082_MW143_180623**	**Normal**	**212780**	0.042		10	63		400					110	-1.8		38	
MW143	**27 Nov 2019**	**0082_MW143_191127**	**Normal**	**EP1912547**	<0.02	14.1	14.3		<1	394	<1	394	9.33	8.78	39	3.04	17		
MW143	**27 Nov 2019**	**0082_QC102_191127**	**Field Duplicate**	**EP1912547**	0.02	14.2	14.4		<1	464	<1	464	10.8	8.55	42	11.7	17		
MW143	**27 Nov 2019**	**0082_QC202_191127**	**Interlab Duplicate**	**691496**	0.02	12.23	12.42		<10	2,000					74			32	22
MW143	**23 Jun 2020**	**0082_MW143_200623**	**Normal**	**EP2006519**	0.06	10.3	10.5		18	455	<1	473	14.8	12.3	157	8.88	42		
MW143	**17 Nov 2020**	**0082_MW143_201117**	**Normal**	**EP2012739**	0.04	9.54	9.70		13	429	<1	442	14.0	12.5	156	5.61	38		
MW143	**21 Jun 2021**	**0082_MW143_210621**	**Normal**	**EP2107028**	0.06	7.86	8.00		6	401	<1	407	14.5	12.6	193	7.04	44		
MW143	**23 Nov 2021**	**0082_MW143_211123**	**Normal**	**EP2114293**	0.08	10.2	10.4		12	424	<1	436	15.4	13.0	204	8.46	46		
MW143	**20 Jun 2022**	**0082_MW143_220620**	**Normal**	**EP2207565**	0.06	8.81	8.92		<1	404	<1	404	14.0	11.9	183	8.09	38		
MW143	**21 Nov 2022**	**0082_MW143_221121**	**Normal**	**EP2215715**	0.02	13.0	13.1		4	398	<1	402	10.1	8.45	58	8.82	20		
MW143	**26 Jun 2023**	**0082_MW143_230626**	**Normal**	**EP2308618**	0.03	9.96	10.1		<1	440	<1	440	12.6	10.9	105	7.36	40		
MW144S	**23 Jun 2018**	**0082_MW144S_180623**	**Normal**	**212780**	0.26		14	120		540					590	0.31		170	
MW144S	**28 Nov 2019**	**0082_MW144_S_191128**	**Normal**	**EP1912606**	0.24	20.5	21.2		<1	635	<1	635	27.8	26.0	430	3.29	141		
MW144S	**25 Jun 2020**	**0082_MW144S_200625**	**Normal**	**EP2006593**	0.22	14.3	15.0		<1	591	<1	591	31.8	25.9	599	10.2	149		
MW144S	**17 Nov 2020**	**0082_MW144_S_201117**	**Normal**	**EP2012739**	0.20	14.5	15.1		<1	556	<1	556	28.5	24.6	508	7.23	147		
MW144S	**17 Nov 2020**	**0082_QC103_201117**	**Field Duplicate**	**EP2012739**	0.20	15.4	16.1		<1	591	<1	591	29.2	25.0	510	7.68	145		
MW144S	**17 Nov 2020**	**0082_QC204_201117**	**Interlab Duplicate**	**758013**	0.18	16.71	17.32		<10	710	<20	710			16,000			3,000	260
MW144S	**21 Jun 2021**	**0082_MW144S_210621**	**Normal**	**EP2107033**	0.27	20.6	21.5		<1	647	<1	647	30.8	27.8	539	5.19	129		
MW144S	**22 Nov 2021**	**0082_MW144S_211122**	**Normal**	**EP2114224**	0.29	23.6	24.4		<1	553	<1	553	25.7	23.9	431	3.60	119		
MW144S	**20 Jun 2022**	**0082_MW144S_220620**	**Normal**	**EP2207565**	0.24	17.2	18.0		<1	606	<1	606	26.7	22.2	416	9.38	139		
MW144S	**21 Nov 2022**	**0082_MW144S_221121**	**Normal**	**EP2215643**	0.21	21.9	22.7		3	548	<1	551	22.6	19.7	325	6.82	117		

					PFAS			Inorganics										
					Perfluorobutane sulfonic acid (PFBS)	Sum of PFAS (WA DER List)	Sum of PFAS	Hardness	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Sulphate	Calcium
					µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.001	0.001	3	1	1	1	1	0.01	0.01	1	0.01	1	1	0.1
PFAS NEMP 2020 Interim Marine 99%																			
PFAS NEMP 2020 Recreational Water																			
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**															
MW144S	**21 Nov 2022**	**0082_QC106_221121**	**Field Duplicate**	**EP2215643**	0.19	21.3	22.0												
MW144S	**21 Nov 2022**	**0082_QC206_221120**	**Interlab Duplicate**	**945158**	0.19	23.57	24.27												
MW144S	**26 Jun 2023**	**0082_MW144S_230626**	**Normal**	**EP2308607**	0.33	17.4	18.2		<1	545	<1	545	24.5	23.3	400	2.58	113		
MW145	**20 Jun 2018**	**0082_MW145_180620**	**Normal**	**212570**	0.41			5,700		280					17,000	6.5		2,500	
MW145	**27 Nov 2019**	**0082_MW145_191127**	**Normal**	**EP1912549**	<0.02	<0.01	<0.01		<1	256	<1	256	558	610	17,700	4.48	2,560		
MW145	**25 Jun 2020**	**0082_MW145_200625**	**Normal**	**EP2006593**	<0.02	<0.01	<0.01		<1	257	<1	257	567	561	18,000	0.56	2,610		
MW145	**25 Jun 2020**	**0082_QC101_200625**	**Field Duplicate**	**EP2006593**	<0.02	<0.01	<0.01		<1	261	<1	261	575	568	18,200	0.64	2,710		
MW145	**25 Jun 2020**	**0082_QC201_200625**	**Interlab Duplicate**	**729348**	<0.01	<0.05	<0.1		<10	130					47,000			7,600	1,600
MW145	**17 Nov 2020**	**0082_MW145_201117**	**Normal**	**EP2012738**	<0.02	<0.01	<0.01		<1	248	<1	248	594	616	19,000	1.84	2,560		
MW145	**21 Jun 2021**	**0082_MW145_210621**	**Normal**	**EP2107028**	<0.02	<0.01	<0.01		<1	252	<1	252	567	654	18,100	7.05	2,490		
MW145	**21 Jun 2021**	**0082_QC106_210621**	**Field Duplicate**	**EP2107028**	<0.02	<0.01	<0.01		<1	247	<1	247	570	669	18,200	8.00	2,480		
MW145	**21 Jun 2021**	**0082_QC206_210621**	**Interlab Duplicate**	**805490**	<0.01	<0.05	<0.1		<10	660	<20	660			19,000			3,000	550
MW145	**22 Nov 2021**	**0082_MW145_211122**	**Normal**	**EP2114227**	<0.02	<0.01	<0.01		<1	270	<1	270	571	602	18,100	2.70	2,640		
MW145	**20 Jun 2022**	**0082_MW145_220620**	**Normal**	**EP2207563**	<0.02	<0.01	<0.01		<1	283	<1	283	552	580	17,400	2.49	2,680		
MW145	**21 Nov 2022**	**0082_MW145_221121**	**Normal**	**EP2215643**	<0.02	<0.01	<0.01		<1	307	<1	307	519	585	16,300	6.02	2,530		
MW145	**21 Nov 2022**	**0082_QC104_221121**	**Field Duplicate**	**EP2215643**	<0.02	<0.01	<0.01												
MW145	**21 Nov 2022**	**0082_QC204_221120**	**Interlab Duplicate**	**945158**	<0.01	<0.05	<0.1												
MW145	**26 Jun 2023**	**0082_MW145_230626**	**Normal**	**EP2308607**	<0.02	<0.01	<0.01		<1	336	<1	336	538	613	16,900	6.54	2,600		
MW147	**21 Jun 2018**	**0082_MW147_180621**	**Normal**	**212780**	<0.001		0.020	3,700		180					13,000	-3.3		1,400	
MW147	**27 Nov 2019**	**0082_MW147_191127**	**Normal**	**EP1912549**	<0.02	<0.01	<0.01		<1	251	<1	251	401	428	12,900	3.35	1,530		
MW147	**17 Nov 2020**	**0082_MW147_201117**	**Normal**	**EP2012748**	<0.02	<0.01	<0.01		<1	290	<1	290	413	422	13,200	1.06	1,690		
MW147	**22 Jun 2021**	**0082_MW147_210622**	**Normal**	**EP2107183**	<0.02	<0.01	<0.01		<1	306	<1	306	388	405	12,500	2.14	1,390		
MW147	**22 Jun 2021**	**0082_QC107_210622**	**Field Duplicate**	**EP2107183**	<0.02	<0.01	<0.01		<1	313	<1	313	385	417	12,400	3.95	1,390		
MW147	**22 Jun 2021**	**0082_QC207_210622**	**Interlab Duplicate**	**805490**	<0.01	<0.05	<0.1		<10	2,900	<20	2,900			12,000			1,700	420
MW147	**22 Nov 2021**	**0082_MW147_211122**	**Normal**	**EP2114227**	<0.02	<0.01	<0.01		<1	346	<1	346	399	409	12,700	1.23	1,630		
MW147	**20 Jun 2022**	**0082_MW147_220620**	**Normal**	**EP2207563**	<0.02	<0.01	<0.01		<1	338	<1	338	396	340	12,600	7.55	1,630		
MW147	**21 Nov 2022**	**0082_MW147_221121**	**Normal**	**EP2215643**	<0.02	<0.01	<0.01		<1	338	<1	338	369	374	11,700	0.66	1,550		
MW147	**26 Jun 2023**	**0082_MW147_230626**	**Normal**	**EP2308608**	<0.02	<0.01	<0.01		<1	410	<1	410	363	388	11,500	3.29	1,480		
MW147	**26 Jun 2023**	**0082_QC101_230626**	**Field Duplicate**	**EP2308608**	<0.02	<0.01	<0.01		<1	395	<1	395	368	392	11,700	3.12	1,440		
MW147	**26 Jun 2023**	**0082_QC201_230626**	**Interlab Duplicate**	**1004374**	<0.01	<0.05	<0.1												
MW148S	**21 Jun 2018**	**0082_MW148S_180621**	**Normal**	**212780**	<0.001		0.008	4,700		290					16,000	-3.0		2,000	
MW148S	**27 Nov 2019**	**0082_MW148S_191127**	**Normal**	**EP1912549**	<0.02	<0.01	<0.01		<1	313	<1	313	474	509	15,100	3.51	2,030		
MW148S	**27 Nov 2019**	**0082_QC101_191127**	**Field Duplicate**	**EP1912549**	<0.02	<0.01	<0.01		<1	316	<1	316	476	526	15,200	4.98	1,980		
MW148S	**27 Nov 2019**	**0082_QC201_191127**	**Interlab Duplicate**	**691496**	<0.01	<0.05	<0.1		<10	590					23,000			2,200	520
MW148S	**23 Jun 2020**	**0082_MW148S_200623**	**Normal**	**EP2006519**	<0.02	0.01	0.01		<1	386	<1	386	491	490	15,500	0.10	2,210		
MW148S	**23 Jun 2020**	**0082_QC104_200623**	**Field Duplicate**	**EP2006519**	<0.02	<0.01	<0.01		<1	308	<1	308	489	486	15,500	0.29	2,210		
MW148S	**23 Jun 2020**	**0082_QC204_200623**	**Interlab Duplicate**	**728790**	<0.01	<0.05	<0.1		1,200	21,000					17,000			2,200	530
MW148S	**17 Nov 2020**	**0082_MW148S_201117**	**Normal**	**EP2012748**	<0.02	<0.01	<0.01		<1	295	<1	295	484	492	15,400	0.79	2,100		
MW148S	**21 Jun 2021**	**0082_MW148S_210621**	**Normal**	**EP2107033**	<0.02	<0.01	<0.01		<1	333	<1	333	440	533	14,000	9.57	1,830		
MW148S	**22 Nov 2021**	**0082_MW148S_211122**	**Normal**	**EP2114227**	<0.02	<0.01	<0.01		<1	294	<1	294	470	476	14,900	0.73	2,090		
MW148S	**20 Jun 2022**	**0082_MW148S_220620**	**Normal**	**EP2207563**	<0.02	<0.01	<0.01		<1	325	<1	325	431	455	13,500	2.74	2,080		
MW148S	**21 Nov 2022**	**0082_MW148S_221121**	**Normal**	**EP2215643**	<0.02	<0.01	<0.01		<1	306	<1	306	440	477	13,900	4.04	1,990		
MW148S	**26 Jun 2023**	**0082_MW148S_230626**	**Normal**	**EP2308608**	<0.02	<0.01	<0.01		<1	415	<1	415	455	504	14,400	5.07	1,960		
MW151S	**21 Jun 2018**	**0082_MW151S_180621**	**Normal**	**212780**	<0.001		<0.001	6,500		260					22,000	-2.2		2,800	
MW151S	**27 Nov 2019**	**0082_MW151S_191127**	**Normal**	**EP1912546**	<0.02	<0.01	<0.01		<1	236	<1	236	619	675	19,800	4.36	2,660		
MW151S	**23 Jun 2020**	**0082_MW151S_200623**	**Normal**	**EP2006518**	<0.02	<0.01	<0.01		<1	1,700	<1	1,700	650	677	19,800	2.01	2,770		
MW151S	**16 Nov 2020**	**0082_MW151_S_201116**	**Normal**	**EP2012737**	<0.02	<0.01	<0.01		<1	213	<1	213	641	682	20,600	3.13	2,670		
MW151S	**21 Jun 2021**	**0082_MW151S_210621**	**Normal**	**EP2107024**	<0.02	<0.01	<0.01		<1	236	<1	236	589	704	18,900	8.87	2,480		
MW151S	**22 Nov 2021**	**0082_MW151S_211122**	**Normal**	**EP2114227**	<0.02	<0.01	<0.01		<1	249	<1	249	604	632	19,200	2.22	2,770		
MW151S	**20 Jun 2022**	**0082_MW151S_220620**	**Normal**	**EP2207564**	<0.02	<0.01	<0.01		<1	255	<1	255	593	643	18,800	4.06	2,770		
MW151S	**21 Nov 2022**	**0082_MW151S_221121**	**Normal**	**EP2215643**	<0.02	<0.01	<0.01		<1	223	<1	223	568	633	18,100	5.36	2,570		
MW151S	**26 Jun 2023**	**0082_MW151S_230626**	**Normal**	**EP2308608**	<0.02	<0.01	<0.01		<1	398	<1	398	586	677	18,500	7.20	2,700		
MW152S	**21 Jun 2018**	**0082_MW152S_180621**	**Normal**	**212780**	<0.001		0.003	5,900		210					19,000	-1.0		2,500	
MW152S	**27 Nov 2019**	**0082_MW152S_191127**	**Normal**	**EP1912546**	<0.02	<0.01	<0.01		<1	245	<1	245	552	607	17,400	4.77	2,690		
MW152S	**27 Nov 2019**	**0082_QC105_191127**	**Field Duplicate**	**EP1912546**	<0.02	<0.01	<0.01		<1	249	<1	249	557	643	17,500	7.17	2,820		
MW152S	**27 Nov 2019**	**0082_QC205_191127**	**Interlab Duplicate**	**691496**	<0.01	<0.05	<0.1		<10	4,600					18,000			2,600	450
MW152S	**23 Jun 2020**	**0082_MW152S_200623**	**Normal**	**EP2006518**	<0.02	<0.01	<0.01		<1	243	<1	243	544	587	17,300	3.85	2,450		
MW152S	**16 Nov 2020**	**0082_MW152S_201116**	**Normal**	**EP2012669**	<0.02	<0.01	<0.01		<1	182	<1	182	570	598	18,100	2.34	2,700		
MW152S	**22 Jun 2021**	**0082_MW152S_210622**	**Normal**	**EP2107092**	<0.02	<0.01	<0.01		<1	228	<1	228	562	612	18,100	4.23	2,260		
MW152S	**22 Nov 2021**	**0082_MW152S_211122**	**Normal**	**EP2114227**	<0.02	<0.01	<0.01		<1	173	<1	173	562	587	17,900	2.22	2,570		
MW152S	**20 Jun 2022**	**0082_MW152S_220620**	**Normal**	**EP2207564**	<0.02	<0.01	<0.01		<1	287	<1	287	549	577	17,400	2.47	2,520		
MW152S	**21 Nov 2022**	**0082_MW152S_221121**	**Normal**	**EP2215643**	<0.02	<0.01	<0.01		<1	193	<1	193	547	584	17,400	3.24	2,520		
MW152S	**26 Jun 2023**	**0082_MW152S_230626**	**Normal**	**EP2308608**	<0.02	<0.01	<0.01		<1	330	<1	330	530	588	16,800	5.19	2,400		
MW153S	**22 Jun 2018**	**0082_MW153S_180622**	**Normal**	**212780**	<0.001		0.004	5,500		240					19,000	-2.5		2,400	
MW153S	**28 Nov 2019**	**0082_MW153S_191128**	**Normal**	**EP1912599**	<0.02	0.29	0.29		<1	345	<1	345	498	570	15,800	6.82	2,160		

				PFAS			Inorganics										
				Perfluorobutane sulfonic acid (PFBS)	Sum of PFAS (WA DER List)	Sum of PFAS	Hardness	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Sulphate	Calcium
				µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L
LOR - Limit of Reporting				0.001	0.001	0.001	3	1	1	1	1	0.01	0.01	1	0.01	1	1	0.1
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
MW153S	**23 Jun 2020**	**0082_MW153S_200623**	**Normal**	**EP2006518**	<0.02	<0.01	<0.01		<1	376	<1	376	515	533	16,400	1.76	2,150		
MW153S	**16 Nov 2020**	**0082_MW153S_201116**	**Normal**	**EP2012669**	<0.02	<0.01	<0.01		<1	370	<1	370	526	553	16,700	2.48	2,280		
MW153S	**22 Jun 2021**	**0082_MW153S_210622**	**Normal**	**EP2107086**	<0.02	<0.01	<0.01		<1	288	<1	288	534	572	17,200	3.52	2,050		
MW153S	**23 Nov 2021**	**0082_MW153S_211123**	**Normal**	**EP2114294**	<0.02	<0.01	<0.01		<1	312	<1	312	504	511	16,000	0.67	2,230		
MW153S	**20 Jun 2022**	**0082_MW153S_220620**	**Normal**	**EP2207564**	<0.02	<0.01	<0.01		<1	310	<1	310	511	540	16,300	2.75	2,150		
MW153S	**21 Nov 2022**	**0082_MW153S_221121**	**Normal**	**EP2215715**	<0.02	<0.01	<0.01		<1	327	<1	327	474	510	15,000	3.66	2,110		
MW153S	**26 Jun 2023**	**0082_MW153S_230626**	**Normal**	**EP2308608**	<0.02	<0.01	<0.01		<1	333	<1	333	482	565	15,400	7.92	1,980		
MW154S	**20 Jun 2018**	**0082_MW154S_180620**	**Normal**	**212780**	0.071		1.1	2,200		380					6,700	2.1		1,200	
MW154S	**27 Nov 2019**	**0082_MW154S_191127**	**Normal**	**EP1912548**	0.07	0.84	0.90		<1	379	<1	379	225	216	7,110	1.99	795		
MW154S	**23 Jun 2020**	**0082_MW154S_200623**	**Normal**	**EP2006549**	0.12	1.42	1.60		<1	330	<1	330	234	245	7,390	2.30	911		
MW154S	**16 Nov 2020**	**0082_MW154S_201116**	**Normal**	**EP2012669**	0.11	1.74	1.89		<1	399	<1	399	252	248	7,690	0.75	1,280		
MW154S	**21 Jun 2021**	**0082_MW154S_210621**	**Normal**	**EP2107033**	0.13	1.59	1.73		<1	432	<1	432	295	287	9,350	1.51	1,110		
MW154S	**22 Nov 2021**	**0082_MW154S_211122**	**Normal**	**EP2114227**	0.20	2.81	2.99		<1	505	<1	505	316	292	9,840	4.05	1,380		
MW154S	**20 Jun 2022**	**0082_MW154S_220620**	**Normal**	**EP2207563**	0.23	2.92	3.16		<1	542	<1	542	274	274	8,420	<0.01	1,240		
MW154S	**21 Nov 2022**	**0082_MW154S_221121**	**Normal**	**EP2215715**	0.21	2.94	3.25		<1	518	<1	518	290	314	8,790	4.01	1,500		
MW154S	**26 Jun 2023**	**0082_MW154S_230626**	**Normal**	**EP2308618**	0.21	2.52	2.78		<1	525	<1	525	273	293	8,310	3.55	1,360		
MW155S	**22 Jun 2018**	**0082_MW155S_180622**	**Normal**	**212780**	<0.001		<0.001	2,200		490					6,200	1.9		830	
MW155S	**27 Nov 2019**	**0082_MW155S_191127**	**Normal**	**EP1912548**	<0.02	0.16	0.16		<1	508	<1	508	221	214	6,800	1.46	904		
MW155S	**23 Jun 2020**	**0082_MW155S_200623**	**Normal**	**EP2006549**	<0.02	<0.01	<0.01		<1	503	<1	503	282	311	8,750	4.88	1,220		
MW155S	**16 Nov 2020**	**0082_MW155S_201116**	**Normal**	**EP2012669**	<0.02	<0.01	<0.01		<1	481	<1	481	276	266	8,730	1.98	993		
MW155S	**21 Jun 2021**	**0082_MW155S_210621**	**Normal**	**EP2107024**	<0.02	<0.01	<0.01		<1	462	<1	462	256	270	8,000	2.60	1,010		
MW155S	**22 Nov 2021**	**0082_MW155S_211122**	**Normal**	**EP2114226**	<0.02	<0.01	<0.01		<1	489	<1	489	263	250	8,190	2.42	1,050		
MW155S	**20 Jun 2022**	**0082_MW155S_220620**	**Normal**	**EP2207565**	<0.02	<0.01	<0.01		<1	490	<1	490	260	250	7,970	1.83	1,200		
MW155S	**21 Nov 2022**	**0082_MW155S_221121**	**Normal**	**EP2215643**	<0.02	<0.01	<0.01		<1	516	<1	516	241	267	7,360	5.05	1,120		
MW155S	**26 Jun 2023**	**0082_MW155S_230626**	**Normal**	**EP2308618**	<0.02	<0.01	<0.01		<1	530	<1	530	245	269	7,470	4.66	1,140		
MW310	**09 Mar 2018**	**0082_BDDBO20_180309**	**Normal**	**208025**	1.4			230		740					640	-0.70		250	
MW310	**18 Jun 2018**	**0082_B020_180618**	**Normal**	**212373**	1.7			240		740					630	-0.63		260	
MW310	**27 Nov 2019**	**0082_B020_191127**	**Normal**	**EP1912547**	1.05	10.2	11.2		<1	757	<1	757	37.9	38.1	628	0.26	245		
MW310	**27 Nov 2019**	**0082_QC103_191127**	**Field Duplicate**	**EP1912547**	1.01	9.91	10.9		<1	771	<1	771	38.1	38.3	624	0.28	246		
MW310	**27 Nov 2019**	**0082_QC203_191127**	**Interlab Duplicate**	**691496**	0.97	8.94	10.56		<10	3,500					660			260	44
MW310	**23 Jun 2020**	**0082_MW310_200623**	**Normal**	**EP2006519**	1.71	19.8	22.4		<1	701	<1	701	37.7	34.9	663	3.89	241		
MW310	**17 Nov 2020**	**0082_MW310_201117**	**Normal**	**EP2012739**	2.39	19.4	21.2		<1	694	<1	694	49.2	47.2	1,020	2.12	316		
MW310	**21 Jun 2021**	**0082_MW310_210621**	**Normal**	**EP2107028**	1.50	31.2	33.8		<1	660	<1	660	32.9	30.3	547	4.02	204		
MW310	**22 Nov 2021**	**0082_MW310_211122**	**Normal**	**EP2114224**	7.46	56.1	61.4		<1	685	<1	685	38.4	38.7	664	0.38	288		
MW310	**20 Jun 2022**	**0082_MW310_220620**	**Normal**	**EP2207565**	5.83	96.5	105		<1	666	<1	666	36.8	33.6	582	4.50	338		
MW310	**21 Nov 2022**	**0082_MW310_221121**	**Normal**	**EP2215715**	4.25	78.5	85.5		<1	660	<1	660	32.8	30.8	489	3.15	278		
MW310	**26 Jun 2023**	**0082_MW310_230626**	**Normal**	**EP2308618**	5.29	47.4	54.0		<1	1,050	<1	1,050	43.2	36.5	536	8.40	342		
MW311	**18 Jun 2018**	**0082_B021_180618**	**Normal**	**212373**	0.023			110		260					31	-2.7		15	
MW311	**27 Nov 2019**	**0082_B021_191127**	**Normal**	**EP1912547**	0.03	1.59	1.62		<1	304	<1	304	7.39	7.15	34	1.63	17		
MW311	**23 Jun 2020**	**0082_MW311_200623**	**Normal**	**EP2006519**	0.04	2.30	2.36		<1	407	<1	407	9.57	7.22	37	14.0	19		
MW311	**17 Nov 2020**	**0082_MW311_201117**	**Normal**	**EP2012739**	0.03	2.14	2.18		<1	338	<1	338	8.08	7.76	33	2.02	19		
MW311	**21 Jun 2021**	**0082_MW311_210621**	**Normal**	**EP2107028**	<0.02	1.43	1.43		<1	227	<1	227	6.34	6.07	41	2.14	31		
MW311	**22 Nov 2021**	**0082_MW311_211122**	**Normal**	**EP2114224**	0.03	0.35	0.35		<1	182	<1	182	4.45	4.16	23	3.42	8		
MW311	**22 Nov 2021**	**0082_QC105_211122**	**Field Duplicate**	**EP2114224**	<0.02	0.32	0.32												
MW311	**22 Nov 2021**	**0082_QC205_211122**	**Interlab Duplicate**	**844500**	<0.01	0.27	0.27												
MW311	**20 Jun 2022**	**0082_MW311_220620**	**Normal**	**EP2207565**	<0.02	0.56	0.56		<1	227	<1	227	5.32	5.62	19	2.74	12		
MW311	**20 Jun 2022**	**0082_QC105_220620**	**Field Duplicate**	**EP2207565**	<0.02	0.56	0.56		<1	231	<1	231	5.43	5.60	20	1.52	12		
MW311	**20 Jun 2022**	**0082_QC205_220620**	**Interlab Duplicate**	**901186**	0.002	0.52	0.54												
MW311	**21 Nov 2022**	**0082_MW311_221121**	**Normal**	**EP2215715**	<0.02	0.53	0.53		<1	169	<1	169	3.93	3.42	16	6.95	5		
MW311	**21 Nov 2022**	**0082_QC105_221121**	**Field Duplicate**	**EP2215715**	<0.02	0.56	0.56		<1	166	<1	166	3.87	3.42	16	6.18	5		
MW311	**21 Nov 2022**	**0082_QC205_221120**	**Interlab Duplicate**	**945158**	<0.01	0.32	0.32												
MW311	**26 Jun 2023**	**0082_MW311_230626**	**Normal**	**EP2308618**	<0.02	0.34	0.34		<1	174	<1	174	4.76	4.74	30	0.20	21		
MW315	**22 Feb 2018**	**0082_BA1_180222**	**Normal**	**207359**	0.001			32		680					25	-4.7		16	
MW315	**10 Jun 2018**	**0082_BA1_180610**	**Normal**	**212095**	0.001			32		640					25	-2.4		13	
MW315	**27 Nov 2019**	**0082_BA1_191127**	**Normal**	**EP1912547**	<0.02	<0.01	<0.01		15	737	<1	753	17.2	14.3	51	8.99	33		
MW315	**25 Jun 2020**	**0082_MW315_200625**	**Normal**	**EP2006593**	<0.02	<0.01	<0.01		17	761	<1	778	18.6	14.6	76	12.1	44		
MW315	**17 Nov 2020**	**0082_MW315_201117**	**Normal**	**EP2012738**	<0.02	0.12	0.12		12	689	<1	702	16.8	14.7	66	6.81	46		
MW315	**21 Jun 2021**	**0082_MW315_210621**	**Normal**	**EP2107033**	<0.02	<0.01	<0.01		10	666	<1	676	19.3	17.3	134	5.31	96		
MW315	**22 Nov 2021**	**0082_MW315_211122**	**Normal**	**EP2114224**	<0.02	<0.01	<0.01		7	695	<1	703	15.1	14.4	28	2.56	15		
MW315	**20 Jun 2022**	**0082_MW315_220620**	**Normal**	**EP2207565**	<0.02	<0.01	<0.01		<1	717	<1	717	16.0	13.3	40	9.02	24		
MW315	**20 Jun 2022**	**0082_QC103_220620**	**Field Duplicate**	**EP2207565**	<0.02	<0.01	<0.01		4	718	<1	722	16.6	14.0	49	8.43	38		
MW315	**20 Jun 2022**	**0082_QC203_220620**	**Interlab Duplicate**	**901186**	<0.002	0.003	0.003												
MW315	**21 Nov 2022**	**0082_MW315_221121**	**Normal**	**EP2215715**	<0.02	<0.01	<0.01		41	721	<1	762	16.6	14.0	41	8.43	12		
MW315	**21 Nov 2022**	**0082_QC107_221121**	**Field Duplicate**	**EP2215715**	<0.02	<0.01	<0.01		37	735	<1	772	16.8	14.0	42	9.17	8		
MW315	**21 Nov 2022**	**0082_QC207_221120**	**Interlab Duplicate**	**945158**	<0.01	0.07	<0.1												

	PFAS			Inorganics											
	Perfluorobutane sulfonic acid (PFBS)	Sum of PFAS (WA DER List)	Sum of PFAS	Hardness	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Sulphate	Calcium
	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L
LOR - Limit of Reporting	0.001	0.001	0.001	3	1	1	1	1	0.01	0.01	1	0.01	1	1	0.1
PFAS NEMP 2020 Interim Marine 99%															
PFAS NEMP 2020 Recreational Water															

Location Code	Date	Field ID	Sample Type	Lab Report Number													
MW315	**26 Jun 2023**	**0082_MW315_230626**	**Normal**	**EP2308618**	<0.02	<0.01	<0.01		<1	808	<1	808	17.7	15.1	47	7.99	12		
MW315	**26 Jun 2023**	**0082_QC104_230626**	**Field Duplicate**	**EP2308618**	<0.02	<0.01	<0.01		2	789	<1	791	17.5	15.2	49	6.80	14		
MW315	**26 Jun 2023**	**0082_QC204_230626**	**Interlab Duplicate**	**1004374**	<0.01	<0.05	<0.1												
MW326	**22 Feb 2018**	**0082_BB8_180222**	**Normal**	**207359**	0.008			4,200		370					14,000	0.13		2,900	
MW326	**21 Jun 2018**	**0082_BB8_180621**	**Normal**	**212780**	0.008		0.048	4,200		400					14,000	4.0		2,400	
MW326	**28 Nov 2019**	**0082_BB8_191128**	**Normal**	**EP1912606**	<0.02	0.03	0.03		<1	466	<1	466	414	490	12,800	8.46	2,080		
MW326	**28 Nov 2019**	**0082_QC101_191128**	**Field Duplicate**	**EP1912606**	<0.02	0.02	0.02		<1	469	<1	469	422	508	13,100	9.32	2,060		
MW326	**28 Nov 2019**	**0082_QC201_191128**	**Interlab Duplicate**	**691486**	<0.01	<0.05	<0.1		<10	510					13,000			2,400	320
MW326	**23 Jun 2020**	**0082_MW326_200623**	**Normal**	**EP2006519**	<0.02	0.06	0.06		<1	405	<1	405	452	460	14,000	0.91	2,350		
MW326	**17 Nov 2020**	**0082_MW326_201117**	**Normal**	**EP2012738**	<0.02	0.13	0.13		<1	429	<1	429	462	482	14,200	2.14	2,520		
MW326	**17 Nov 2020**	**0082_QC104_201117**	**Field Duplicate**	**EP2012738**	<0.02	0.09	0.09		<1	388	<1	388	468	461	14,400	0.80	2,600		
MW326	**17 Nov 2020**	**0082_QC203_201117**	**Interlab Duplicate**	**758013**	0.01	0.09	<0.1		17	2,300	<20	2,400			620			170	9.3
MW326	**21 Jun 2021**	**0082_MW326_210621**	**Normal**	**EP2107028**	<0.02	0.10	0.10		<1	569	<1	569	402	472	12,300	8.08	2,080		
MW326	**23 Nov 2021**	**0082_MW326_211123**	**Normal**	**EP2114295**	<0.02	0.10	0.10		<1	478	<1	478	440	418	13,400	2.48	2,500		
MW326	**20 Jun 2022**	**0082_MW326_220620**	**Normal**	**EP2207563**	0.02	0.21	0.21		<1	848	<1	848	386	380	11,800	0.85	1,760		
MW326	**21 Nov 2022**	**0082_MW326_221121**	**Normal**	**EP2215643**	0.03	0.17	0.17		<1	652	<1	652	382	409	11,500	3.44	2,120		
MW326	**26 Jun 2023**	**0082_MW326_230626**	**Normal**	**EP2308607**	<0.02	0.09	0.09		<1	501	<1	501	413	445	12,500	3.66	2,440		
MW326	**26 Jun 2023**	**0082_QC102_230626**	**Field Duplicate**	**EP2308607**	<0.02	0.09	0.09												
MW326	**26 Jun 2023**	**0082_QC202_230626**	**Interlab Duplicate**	**1004374**	0.01	0.08	<0.1												

First time detectionof PFOA or PFHxS+PFOS

New exceedance of guideline value

					Metals							
					Perfluorobutane sulfonic acid (PFBS)	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
					µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.1	0.1	0.1	0.1	0.1	0.5	0.5
PFAS NEMP 2020 Interim Marine 99%												
PFAS NEMP 2020 Recreational Water												
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**								
MW022	**21 Feb 2018**	**0082_MW22_180221**	**Normal**	**207287**	0.2	40		32		20		220
MW022	**09 Jun 2018**	**0082_MW22_180609**	**Normal**	**212095**	0.12	33		25		21		210
MW022	**27 Nov 2019**	**0082_MW22_191127**	**Normal**	**EP1912548**	0.10	36		26		27		151
MW022	**27 Nov 2019**	**0082_QC104_191127**	**Field Duplicate**	**EP1912548**	0.10	36		26		26		164
MW022	**27 Nov 2019**	**0082_QC204_191127**	**Interlab Duplicate**	**691496**	0.10		28		20		180	
MW022	**23 Jun 2020**	**0082_MW022_200623**	**Normal**	**EP2006549**	0.16	35		30		39		159
MW022	**22 Jun 2021**	**0082_MW022_210622**	**Normal**	**EP2107092**	0.09	24		23		36		183
MW022	**22 Nov 2021**	**0082_MW022_211122**	**Normal**	**EP2114224**	0.13	30		26		29		120
MW022	**20 Jun 2022**	**0082_MW022_220620**	**Normal**	**EP2207563**	0.07	41		29		26		98
MW022	**21 Nov 2022**	**0082_MW022_221121**	**Normal**	**EP2215715**	<0.02	38		27		17		34
MW022	**26 Jun 2023**	**0082_MW022_230626**	**Normal**	**EP2308618**	0.03	50		31		20		59
MW103D	**09 Mar 2018**	**0082_MW103D_180309**	**Normal**	**208025**	0.22	180		93		18		580
MW103D	**09 Mar 2018**	**0082_QC1404_180309**	**Field Duplicate**	**208025**	0.23	180		91		17		570
MW103D	**09 Jun 2018**	**0082_MW103D_180609**	**Normal**	**212095**	0.19	200		100		16		570
MW103D	**27 Nov 2019**	**0082_MW103D_191127**	**Normal**	**EP1912547**	0.26	202		116		25		535
MW103D	**23 Jun 2020**	**0082_MW103D_200623**	**Normal**	**EP2006519**	0.31	275		161		29		676
MW103D	**23 Jun 2020**	**0082_QC103_200623**	**Field Duplicate**	**EP2006519**	0.22	275		159		29		674
MW103D	**23 Jun 2020**	**0082_QC203_200623**	**Interlab Duplicate**	**728790**	0.14		160		23		760	
MW103D	**17 Nov 2020**	**0082_MW103D_201117**	**Normal**	**EP2012738**	0.20	288		162		31		692
MW103D	**21 Jun 2021**	**0082_MW103D_210621**	**Normal**	**EP2107028**	0.27	337		200		37		805
MW103D	**21 Jun 2021**	**0082_QC104_210621**	**Field Duplicate**	**EP2107028**	0.26	315		186		34		777
MW103D	**21 Jun 2021**	**0082_QC204_210621**	**Interlab Duplicate**	**805490**	0.26		170		21		740	
MW103D	**23 Nov 2021**	**0082_MW103D_211123**	**Normal**	**EP2114295**	0.50	230		138		26		601
MW103D	**20 Jun 2022**	**0082_MW103D_220620**	**Normal**	**EP2207565**	0.33	229		132		27		536
MW103D	**21 Nov 2022**	**0082_MW103D_221121**	**Normal**	**EP2215715**	0.27	210		122		24		540
MW103D	**26 Jun 2023**	**0082_MW103D_230626**	**Normal**	**EP2308618**	0.22	231		129		26		548
MW105S	**09 Mar 2018**	**0082_MW105S_180309**	**Normal**	**208025**	0.055	37		39		40		360
MW105S	**04 Jun 2018**	**0082_MW105S_180604**	**Normal**	**211639**	0.057	31		38		38		290
MW105S	**27 Nov 2019**	**0082_MW105S_191127**	**Normal**	**EP1912547**	0.11	67		89		60		505
MW105S	**21 Jun 2021**	**0082_MW105S_210621**	**Normal**	**EP2107028**	0.14	29		66		85		984
MW105S	**23 Nov 2021**	**0082_MW105S_211123**	**Normal**	**EP2114293**	0.16	46		90		69		631
MW105S	**20 Jun 2022**	**0082_MW105S_220620**	**Normal**	**EP2207565**	0.25	27		92		99		1,290
MW105S	**21 Nov 2022**	**0082_MW105S_221121**	**Normal**	**EP2215643**	0.14	16		56		70		951
MW105S	**26 Jun 2023**	**0082_MW105S_230626**	**Normal**	**EP2308607**	0.05	6		32		51		488
MW108	**07 Mar 2018**	**0082_MW108_180307**	**Normal**	**208025**	0.009	71		98		65		2,400
MW108	**18 Jun 2018**	**0082_MW108_180618**	**Normal**	**212373**	0.008	62		96		66		2,500
MW108	**21 Nov 2022**	**0082_MW108_221121**	**Normal**	**EP2215643**	<0.02	54		94		102		2,260
MW108	**26 Jun 2023**	**0082_MW108_230626**	**Normal**	**EP2308607**	<0.02	62		109		94		2,350
MW113	**10 Mar 2018**	**0082_MW113_180310**	**Normal**	**208025**	0.026	27		29		31		600
MW113	**09 Jun 2018**	**0082_MW113_180609**	**Normal**	**212095**	0.026	25		29		32		640
MW113	**27 Nov 2019**	**0082_MW113_191127**	**Normal**	**EP1912547**	0.03	23		28		42		622
MW113	**23 Jun 2020**	**0082_MW113_200623**	**Normal**	**EP2006519**	0.03	22		27		41		595
MW113	**17 Nov 2020**	**0082_MW113_201117**	**Normal**	**EP2012738**	0.03	24		30		40		613
MW113	**17 Nov 2020**	**0082_QC106_201117**	**Field Duplicate**	**EP2012738**	0.03	23		30		39		613
MW113	**17 Nov 2020**	**0082_QC206_201117**	**Interlab Duplicate**	**758013**	0.02		29		31		620	
MW113	**21 Jun 2021**	**0082_MW113_210621**	**Normal**	**EP2107028**	0.02	16		23		45		664
MW113	**23 Nov 2021**	**0082_MW113_211123**	**Normal**	**EP2114293**	0.03	13		22		40		650
MW113	**23 Nov 2021**	**0082_QC107_211123**	**Field Duplicate**	**EP2114293**	0.04							
MW113	**23 Nov 2021**	**0082_QC207_211123**	**Interlab Duplicate**	**844500**	0.03							
MW113	**20 Jun 2022**	**0082_MW113_220620**	**Normal**	**EP2207565**	0.03	22		25		43		578
MW113	**21 Nov 2022**	**0082_MW113_221121**	**Normal**	**EP2215715**	0.02	18		24		41		602
MW113	**26 Jun 2023**	**0082_MW113_230626**	**Normal**	**EP2308618**	0.02	15		20		41		580
MW115	**08 Mar 2018**	**0082_MW115_180308**	**Normal**	**208025**	0.008	110		140		84		710
MW115	**09 Jun 2018**	**0082_MW115_180609**	**Normal**	**212095**	0.009	110		140		75		720
MW115	**27 Nov 2019**	**0082_MW115_191127**	**Normal**	**EP1912547**	0.15	117		148		99		738
MW115	**23 Jun 2020**	**0082_MW115_200623**	**Normal**	**EP2006519**	0.26	98		131		85		692
MW115	**17 Nov 2020**	**0082_MW115_201117**	**Normal**	**EP2012738**	0.17	109		134		91		733
MW115	**21 Jun 2021**	**0082_MW115_210621**	**Normal**	**EP2107028**	0.17	101		114		81		705
MW115	**22 Nov 2021**	**0082_MW115_211122**	**Normal**	**EP2114224**	0.33	106		117		81		753
MW115	**22 Nov 2021**	**0082_QC106_211122**	**Field Duplicate**	**EP2114224**	0.30							
MW115	**22 Nov 2021**	**0082_QC206_211122**	**Interlab Duplicate**	**844500**	0.25							
MW115	**20 Jun 2022**	**0082_MW115_220620**	**Normal**	**EP2207565**	0.25	92		93		69		632
MW115	**21 Nov 2022**	**0082_MW115_221121**	**Normal**	**EP2215715**	0.22	76		86		70		654
MW115	**26 Jun 2023**	**0082_MW115_230626**	**Normal**	**EP2308618**	0.15							
MW118D	**05 Mar 2018**	**0082_MW118D_180305**	**Normal**	**207818**	1.2	21		27		39		750

					Metals							
					Perfluorobutane sulfonic acid (PFBS)	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
					µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.1	0.1	0.1	0.1	0.1	0.5	0.5
PFAS NEMP 2020 Interim Marine 99%												
PFAS NEMP 2020 Recreational Water												
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**								
MW118D	**09 Jun 2018**	**0082_MW118D_180609**	**Normal**	**212095**	0.82	22		28		37		640
MW118D	**09 Jun 2018**	**0082_QC156_180609**	**Field Duplicate**	**212095**	1.1	21		27		37		640
MW118D	**09 Jun 2018**	**0082_QC256_180609**	**Interlab Duplicate**	**604115**	1.2		25		37		660	
MW118D	**27 Nov 2019**	**0082_MW118D_191127**	**Normal**	**EP1912548**	0.90	17		25		52		716
MW118D	**23 Jun 2020**	**0082_MW118D_200623**	**Normal**	**EP2006549**	0.82	18		25		60		882
MW118D	**16 Nov 2020**	**0082_MW118D_201116**	**Normal**	**EP2012669**	0.83	17		25		60		870
MW118D	**21 Jun 2021**	**0082_MW118D_210621**	**Normal**	**EP2107033**	0.70	28		67		85		1,270
MW118D	**22 Nov 2021**	**0082_MW118D_211122**	**Normal**	**EP2114224**	0.66	13		22		61		967
MW118D	**20 Jun 2022**	**0082_MW118D_220620**	**Normal**	**EP2207563**	0.45	18		27		59		811
MW118D	**21 Nov 2022**	**0082_MW118D_221121**	**Normal**	**EP2215715**	0.30	16		26		55		800
MW118D	**26 Jun 2023**	**0082_MW118D_230626**	**Normal**	**EP2308618**	0.32	14		25		59		875
MW122	**05 Mar 2018**	**0082_MW122_180305**	**Normal**	**207818**	0.21	44		66		50		1,900
MW122	**16 Jun 2018**	**0082_MW122_180616**	**Normal**	**212373**	0.24	35		65		50		1,800
MW122	**27 Nov 2019**	**0082_MW122_191127**	**Normal**	**EP1912549**	0.28	35		74		88		1,860
MW122	**23 Jun 2020**	**0082_MW122_200623**	**Normal**	**EP2006549**	0.34	30		67		81		1,870
MW122	**16 Nov 2020**	**0082_MW122_201116**	**Normal**	**EP2012669**	0.15	31		58		79		1,730
MW122	**22 Jun 2021**	**0082_MW122_210622**	**Normal**	**EP2107092**	0.15	28		61		83		1,770
MW122	**23 Nov 2021**	**0082_MW122_211123**	**Normal**	**EP2114295**	0.29	27		60		70		1,770
MW122	**20 Jun 2022**	**0082_MW122_220620**	**Normal**	**EP2207565**	0.24	33		63		77		1,630
MW122	**26 Jun 2023**	**0082_MW122_230626**	**Normal**	**EP2308607**	0.12	58		95		77		1,940
MW126	**05 Mar 2018**	**0082_MW126_180305**	**Normal**	**207818**	0.011	32		19		17		160
MW126	**16 Jun 2018**	**0082_MW126_180616**	**Normal**	**212373**	0.006	34		18		12		62
MW126	**27 Nov 2019**	**0082_MW126_191127**	**Normal**	**EP1912546**	0.08	41		27		35		536
MW126	**23 Jun 2020**	**0082_MW126_200623**	**Normal**	**EP2006549**	0.08	55		43		48		887
MW126	**21 Jun 2021**	**0082_MW126_210621**	**Normal**	**EP2107033**	0.06	47		29		32		474
MW126	**22 Nov 2021**	**0082_MW126_211122**	**Normal**	**EP2114226**	0.03	50		27		15		89
MW126	**20 Jun 2022**	**0082_MW126_220620**	**Normal**	**EP2207564**	0.14	48		30		29		436
MW126	**21 Nov 2022**	**0082_MW126_221121**	**Normal**	**EP2215715**	<0.02	34		20		17		93
MW126	**26 Jun 2023**	**0082_MW126_230626**	**Normal**	**EP2308607**	<0.02	43		29		22		162
MW128	**05 Mar 2018**	**0082_MW128_4.2_180305**	**Normal**	**207818**	<0.001	570		1,400		430		13,000
MW128	**05 Mar 2018**	**0082_MW128_6.2_180305**	**Normal**	**207818**	<0.001	610		1,300		420		13,000
MW128	**05 Mar 2018**	**0082_MW128_8.2_180305**	**Normal**	**207818**	<0.001	510		1,400		420		12,000
MW128	**15 Jun 2018**	**0082_MW128_3.7-4.2_180615**	**Normal**	**212373**	<0.001	540		1,300		400		12,000
MW128	**15 Jun 2018**	**0082_MW128_5.7-6.2_180615**	**Normal**	**212373**	<0.001	460		1,300		390		12,000
MW128	**15 Jun 2018**	**0082_MW128_7.7-8.2_180615**	**Normal**	**212373**	<0.001	460		1,300		410		12,000
MW128	**27 Nov 2019**	**0082_MW128_3.7-4.2_191127**	**Normal**	**EP1912546**	<0.02	591		1,600		711		12,900
MW128	**23 Jun 2020**	**0082_MW128_200623**	**Normal**	**EP2006518**	<0.02	513		1,480		549		12,300
MW128	**16 Nov 2020**	**0082_MW128_201116**	**Normal**	**EP2012670**	<0.05	540		1,550		666		12,200
MW128	**21 Jun 2021**	**0082_MW128_3.7-4.2_210621**	**Normal**	**EP2107024**	<0.02	588		1,610		664		12,500
MW128	**22 Nov 2021**	**0082_MW128_3.7-4.2_211122**	**Normal**	**EP2114224**	<0.02	516		1,550		628		12,600
MW128	**20 Jun 2022**	**0082_MW128_220620**	**Normal**	**EP2207565**	0.02	537		1,500		649		11,400
MW128	**20 Nov 2022**	**0082_MW128_3.7-4.2_221120**	**Normal**	**EP2215643**	<0.02	488		1,440		618		11,600
MW128	**26 Jun 2023**	**0082_MW128_3.7-4.2_230626**	**Normal**	**EP2308607**	<0.02	529		1,510		632		12,000
MW129	**05 Mar 2018**	**0082_MW129_3.5-4.0_180305**	**Normal**	**207818**	<0.001	500		1,400		440		13,000
MW129	**05 Mar 2018**	**0082_MW129_5.5-6.0_180305**	**Normal**	**207818**	<0.001	500		1,400		430		13,000
MW129	**05 Mar 2018**	**0082_MW129_7.5-8.0_180305**	**Normal**	**207818**	<0.001	480		1,500		450		13,000
MW129	**21 Jun 2018**	**0082_MW129_3.5-4.0_180621**	**Normal**	**212780**	<0.001	440		1,300		390		12,000
MW129	**21 Jun 2018**	**0082_MW129_5.5-6.0_180621**	**Normal**	**212780**	<0.001	420		1,300		390		12,000
MW129	**21 Jun 2018**	**0082_MW129_7.5-8.0_180621**	**Normal**	**212780**	<0.001	430		1,400		420		12,000
MW129	**27 Nov 2019**	**0082_MW129_3.5-4.0_191127**	**Normal**	**EP1912546**	<0.02	530		1,600		658		12,600
MW129	**23 Jun 2020**	**0082_MW129_200623**	**Normal**	**EP2006518**	<0.02	475		1,410		530		11,900
MW129	**16 Nov 2020**	**0082_MW129_201116**	**Normal**	**EP2012737**	<0.02	522		1,560		662		12,100
MW129	**21 Jun 2021**	**0082_MW129_3.5-4.0_210621**	**Normal**	**EP2107024**	<0.02	537		1,590		641		12,000
MW129	**22 Nov 2021**	**0082_MW129_3.5-4_211122**	**Normal**	**EP2114226**	<0.02	507		1,440		621		11,600
MW129	**20 Jun 2022**	**0082_MW129_3.5-4_220620**	**Normal**	**EP2207564**	<0.02	543		1,600		680		11,800
MW129	**20 Jun 2022**	**0082_QC106_220620**	**Field Duplicate**	**EP2207564**	<0.02	572		1,670		714		12,400
MW129	**20 Jun 2022**	**0082_QC206_220620**	**Interlab Duplicate**	**901186**	<0.002							
MW129	**20 Nov 2022**	**0082_MW129_3.5-4.0_221120**	**Normal**	**EP2215643**	<0.02	493		1,480		628		11,800
MW129	**26 Jun 2023**	**0082_MW129_3.5-4.0_230626**	**Normal**	**EP2308608**	<0.02	497		1,450		601		11,300
MW130	**05 Mar 2018**	**0082_MW130_2.8-3.3_180305**	**Normal**	**207818**	<0.001	430		690		210		7,600
MW130	**05 Mar 2018**	**0082_MW130_4.8-5.3_180305**	**Normal**	**207818**	<0.001	470		980		300		9,600
MW130	**05 Mar 2018**	**0082_MW130_6.8-7.3_180305**	**Normal**	**207818**	<0.001	530		1,300		400		12,000
MW130	**20 Jun 2018**	**0082_MW130_4.8-5.3_180620**	**Normal**	**212780**	0.002	550		1,300		390		12,000
MW130	**20 Jun 2018**	**0082_MW130_6.8-7.3_180620**	**Normal**	**212780**	<0.001	570		1,400		380		13,000
MW130	**20 Jun 2018**	**0082_QC272_180620**	**Interlab Duplicate**	**605980**	<0.01		1,200		370		12,000	

					Metals							
					Perfluorobutane sulfonic acid (PFBS)	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
					µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.1	0.1	0.1	0.1	0.1	0.5	0.5
PFAS NEMP 2020 Interim Marine 99%												
PFAS NEMP 2020 Recreational Water												
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**								
MW130	**23 Jun 2018**	**0082_MW130_2.8-3.3_180623**	**Normal**	**212780**	<0.001	280		490		160		5,300
MW130	**23 Jun 2020**	**0082_MW130_200623**	**Normal**	**EP2006518**	<0.02	493		1,290		471		10,900
MW130	**16 Nov 2020**	**0082_MW130_201116**	**Normal**	**EP2012737**	<0.02	527		1,400		568		11,000
MW130	**21 Jun 2021**	**0082_MW130_6.9-7.4_210621**	**Normal**	**EP2107024**	<0.02	565		1,450		552		11,200
MW130	**22 Nov 2021**	**0082_MW130_211122**	**Normal**	**EP2114226**	<0.02	514		1,330		556		10,700
MW130	**20 Jun 2022**	**0082_MW130_2.9-3.4_220620**	**Normal**	**EP2207564**	<0.02	513		1,450		601		10,800
MW130	**20 Nov 2022**	**0082_MW130_2.9-3.4_221120**	**Normal**	**EP2215643**	<0.02	467		1,310		553		10,500
MW130	**26 Jun 2023**	**0082_MW130_4.9-5.4_230626**	**Normal**	**EP2308608**	<0.02	321		891		359		6,760
MW131	**10 Mar 2018**	**0082_MW131_2.0-2.5_180310**	**Normal**	**208025**	0.001	130		180		81		2,300
MW131	**10 Mar 2018**	**0082_MW131_4.0-4.5_180310**	**Normal**	**208025**	<0.050	550		810		250		9,300
MW131	**10 Mar 2018**	**0082_MW131_6.0-6.5_180310**	**Normal**	**208025**	<0.001	400		1,100		330		9,500
MW131	**10 Mar 2018**	**0082_MW131_8.0-8.5_180310**	**Normal**	**208025**	<0.001	430		1,200		380		11,000
MW131	**20 Jun 2018**	**0082_MW131_2.0-2.5_180620**	**Normal**	**212570**	<0.001	170		220		97		3,100
MW131	**20 Jun 2018**	**0082_MW131_4.0-4.5_180620**	**Normal**	**212570**	0.001	550		1,000		290		10,000
MW131	**20 Jun 2018**	**0082_MW131_6.0-6.5_180620**	**Normal**	**212570**	<0.001	490		1,300		400		12,000
MW131	**20 Jun 2018**	**0082_MW131_8.0-8.5_180620**	**Normal**	**212570**	<0.001	440		1,300		410		12,000
MW131	**28 Nov 2019**	**0082_MW131_4.0-4.5_191128**	**Normal**	**EP1912609**	<0.02	559		1,270		466		9,870
MW131	**23 Jun 2020**	**0082_MW131_200623**	**Normal**	**EP2006518**	<0.02	525		1,160		498		9,480
MW131	**16 Nov 2020**	**0082_MW131_201116**	**Normal**	**EP2012737**	<0.02	586		1,330		519		10,100
MW131	**21 Jun 2021**	**0082_MW131_4.0-4.5_210621**	**Normal**	**EP2107024**	<0.02	23		12		17		234
MW131	**22 Nov 2021**	**0082_MW131_211122**	**Normal**	**EP2114226**	<0.02	52		58		52		785
MW131	**20 Jun 2022**	**0082_MW131_2-2.5_220620**	**Normal**	**EP2207564**	<0.02	75		68		46		268
MW131	**20 Nov 2022**	**0082_MW131_4.0-4.5_221120**	**Normal**	**EP2215643**	<0.02	30		26		50		627
MW131	**26 Jun 2023**	**0082_MW131_4.0-4.5_230626**	**Normal**	**EP2308607**	<0.02	190		304		156		2,820
MW132	**10 Mar 2018**	**0082_MW132_6.4-6.9_180310**	**Normal**	**208025**	0.015	500		1,100		330		10,000
MW132	**10 Mar 2018**	**0082_MW132_8.5-9.0_180310**	**Normal**	**208025**	0.003	540		1,100		340		11,000
MW132	**21 Jun 2018**	**0082_MW132_6.4-6.9_180621**	**Normal**	**212780**	0.018	470		1,200		340		11,000
MW132	**21 Jun 2018**	**0082_MW132_8.5-9.0_180621**	**Normal**	**212780**	0.002	450		1,300		380		12,000
MW132	**27 Nov 2019**	**0082_MW132_6.4-6.9_191127**	**Normal**	**EP1912546**	0.02	479		1,320		563		10,100
MW132	**23 Jun 2020**	**0082_MW132_200623**	**Normal**	**EP2006549**	<0.02	514		1,310		543		10,200
MW132	**16 Nov 2020**	**0082_MW132_201116**	**Normal**	**EP2012670**	<0.02	462		1,310		552		9,990
MW132	**21 Jun 2021**	**0082_MW132_8.5-9.0_210621**	**Normal**	**EP2107024**	<0.02	493		1,450		566		10,800
MW132	**22 Nov 2021**	**0082_MW132_6.4-6.9_211122**	**Normal**	**EP2114224**	<0.02	487		1,390		542		11,000
MW132	**20 Jun 2022**	**0082_MW132_6.4-6.9_220620**	**Normal**	**EP2207564**	0.04	437		1,240		515		9,080
MW132	**21 Nov 2022**	**0082_MW132_6.4-6.9_221121**	**Normal**	**EP2215643**	0.04	416		1,100		461		8,820
MW132	**26 Jun 2023**	**0082_MW132_6.4-6.9_230626**	**Normal**	**EP2308608**	0.03	436		1,150		478		8,980
MW133	**10 Mar 2018**	**0082_MW133_3.0-3.5_180310**	**Normal**	**208025**	0.002	460		1,000		330		9,500
MW133	**10 Mar 2018**	**0082_MW133_5.0-5.5_180310**	**Normal**	**208025**	0.002	570		990		320		10,000
MW133	**10 Mar 2018**	**0082_MW133_7.0-7.5_180310**	**Normal**	**208025**	0.002	490		1,200		380		11,000
MW133	**10 Mar 2018**	**0082_QC1405_180310**	**Field Duplicate**	**208025**	<0.01	500		1,200		390		11,000
MW133	**21 Jun 2018**	**0082_MW133_3.0-3.5_180621**	**Normal**	**212780**	0.001	410		1,000		320		9,900
MW133	**21 Jun 2018**	**0082_MW133_5.0-5.5_180621**	**Normal**	**212780**	0.002	450		1,000		350		10,000
MW133	**21 Jun 2018**	**0082_MW133_7.0-7.5_180621**	**Normal**	**212780**	0.002	510		1,200		380		11,000
MW133	**27 Nov 2019**	**0082_MW133_3.0-3.5_191127**	**Normal**	**EP1912548**	<0.02	521		1,430		532		11,700
MW133	**23 Jun 2020**	**0082_MW133_200623**	**Normal**	**EP2006549**	<0.02	482		1,200		477		10,300
MW133	**16 Nov 2020**	**0082_MW133_201116**	**Normal**	**EP2012737**	<0.02	521		1,320		586		10,600
MW133	**21 Jun 2021**	**0082_MW133_3.0-3.5_210621**	**Normal**	**EP2107024**	<0.02	32		16		12		143
MW133	**22 Nov 2021**	**0082_MW133_3-3.5_211122**	**Normal**	**EP2114224**	<0.02	225		492		230		4,350
MW133	**20 Jun 2022**	**0082_MW133_220620**	**Normal**	**EP2207564**	<0.02	488		1,250		553		9,660
MW133	**21 Nov 2022**	**0082_MW133_3-3.5_221121**	**Normal**	**EP2215643**	<0.02	466		1,190		504		9,730
MW133	**26 Jun 2023**	**0082_MW133_3.0-3.5_230626**	**Normal**	**EP2308618**	<0.02	482		1,260		532		10,100
MW134	**09 Mar 2018**	**0082_MW134_6.6-7.1_180309**	**Normal**	**208025**	<0.01	520		770		210		8,200
MW134	**09 Mar 2018**	**0082_MW134_8.6-9.1_180309**	**Normal**	**208025**	<0.001	530		810		220		8,600
MW134	**22 Jun 2018**	**0082_MW134_6.6-7.1_180622**	**Normal**	**212780**	<0.001	490		830		220		8,700
MW134	**22 Jun 2018**	**0082_MW134_8.6-9.1_180622**	**Normal**	**212780**	<0.001	480		790		210		8,600
MW134	**27 Nov 2019**	**0082_MW134D_191127**	**Normal**	**EP1912549**	<0.02	572		987		397		8,700
MW134	**23 Jun 2020**	**0082_MW134_6.6_200623**	**Normal**	**EP2006519**	<0.02	550		973		390		9,060
MW134	**17 Nov 2020**	**0082_MW134_201117**	**Normal**	**EP2012748**	<0.02	572		989		368		8,550
MW134	**17 Nov 2020**	**0082_QC105_201117**	**Field Duplicate**	**EP2012748**	<0.02	572		983		362		8,470
MW134	**17 Nov 2020**	**0082_QC205_201117**	**Interlab Duplicate**	**758013**	<0.01		840		220		8,000	
MW134	**21 Jun 2021**	**0082_MW134_210621**	**Normal**	**EP2107033**	<0.02	598		1,050		374		8,920
MW134	**22 Nov 2021**	**0082_MW134_211122**	**Normal**	**EP2114227**	<0.02	500		864		354		8,020
MW134	**20 Jun 2022**	**0082_MW134_6.6-7.1_220620**	**Normal**	**EP2207563**	<0.02	566		1,010		373		8,280
MW134	**21 Nov 2022**	**0082_MW134_6.6-7.1_221121**	**Normal**	**EP2215643**	<0.02	523		904		324		8,160
MW134	**26 Jun 2023**	**0082_MW134_6.6-7.1_230626**	**Normal**	**EP2308608**	<0.02	558		964		338		8,280

					Metals							
					Perfluorobutane sulfonic acid (PFBS)	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
					µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.1	0.1	0.1	0.1	0.1	0.5	0.5
PFAS NEMP 2020 Interim Marine 99%												
PFAS NEMP 2020 Recreational Water												
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**								
MW135	**09 Mar 2018**	**0082_MW135_8.3-8.8_180309**	**Normal**	**208025**	<0.01							
MW135	**09 Mar 2018**	**0082_MW135_10.3-10.8_180309**	**Normal**	**208025**	<0.001	170		290		110		4,400
MW135	**22 Jun 2018**	**0082_MW135_8.3-8.8_180622**	**Normal**	**212780**	<0.001	140		270		120		4,700
MW135	**22 Jun 2018**	**0082_MW135_10.3-10.8_180622**	**Normal**	**212780**	<0.001	150		260		100		4,300
MW135	**27 Nov 2019**	**0082_MW135_191127**	**Normal**	**EP1912547**	<0.02	168		468		226		6,000
MW135	**17 Nov 2020**	**0082_MW135_201117**	**Normal**	**EP2012748**	<0.02	142		415		223		5,310
MW135	**21 Jun 2021**	**0082_MW135_210621**	**Normal**	**EP2107028**	<0.02	125		398		220		5,200
MW135	**23 Nov 2021**	**0082_MW135_8.3-8.8_211123**	**Normal**	**EP2114294**	<0.02	113		383		174		4,590
MW135	**20 Jun 2022**	**0082_MW135_10.3-10.8_220620**	**Normal**	**EP2207563**	<0.02	119		374		190		4,360
MW135	**21 Nov 2022**	**0082_MW135_10.3-10.8_221121**	**Normal**	**EP2215643**	<0.02	122		362		175		4,500
MW135	**26 Jun 2023**	**0082_MW135_10.3-10.8_230626**	**Normal**	**EP2308608**	<0.02	109		385		190		4,660
MW137	**09 Mar 2018**	**0082_MW137_6.1-6.6_180309**	**Normal**	**208025**	<0.01	270		390		96		3,700
MW137	**09 Mar 2018**	**0082_MW137_8.1-8.6_180309**	**Normal**	**208025**	<0.01	350		500		110		4,800
MW137	**09 Mar 2018**	**0082_MW137_10.1-10.6_180309**	**Normal**	**208025**	<0.001	480		760		180		7,000
MW137	**21 Jun 2018**	**0082_QC276_180622**	**Interlab Duplicate**	**605977**	<0.01		610		140		4,300	
MW137	**22 Jun 2018**	**0082_MW137_6.0-6.6_180622**	**Normal**	**212780**	<0.001	250		390		99		3,900
MW137	**22 Jun 2018**	**0082_MW137_8.1-8.6_180622**	**Normal**	**212780**	<0.001	310		490		120		5,000
MW137	**22 Jun 2018**	**0082_MW137_10.1-10.6_180622**	**Normal**	**212780**	<0.001	510		860		200		8,100
MW137	**22 Jun 2018**	**0082_QC176_180622**	**Field Duplicate**	**212780**	<0.001	310		500		120		5,000
MW137	**27 Nov 2019**	**0082_MW137_6.1-6.6_191127**	**Normal**	**EP1912548**	<0.02	249		435		133		3,500
MW137	**23 Jun 2020**	**0082_MW137_200623**	**Normal**	**EP2006549**	<0.02	280		455		138		3,810
MW137	**16 Nov 2020**	**0082_MW137_6.6_201116**	**Normal**	**EP2012669**	<0.02	272		472		155		3,580
MW137	**21 Jun 2021**	**0082_MW137_8.1-8.6_210621**	**Normal**	**EP2107024**	<0.02	207		422		147		3,770
MW137	**22 Nov 2021**	**0082_MW137_211122**	**Normal**	**EP2114226**	<0.02	220		446		148		3,510
MW137	**20 Jun 2022**	**0082_MW137_220620**	**Normal**	**EP2207565**	<0.02	229		439		160		3,260
MW137	**21 Nov 2022**	**0082_MW137_6.1-6.6_221121**	**Normal**	**EP2215643**	<0.02	236		472		139		3,600
MW137	**26 Jun 2023**	**0082_MW137_6.1-6.6_230626**	**Normal**	**EP2308618**	<0.02	270		469		143		3,760
MW142	**22 Jun 2018**	**0082_MW142_180622**	**Normal**	**212780**	0.042	96		84		40		460
MW142	**27 Nov 2019**	**0082_MW142_191127**	**Normal**	**EP1912547**	0.04	126		108		58		559
MW142	**23 Jun 2020**	**0082_MW142_200623**	**Normal**	**EP2006519**	0.08	143		126		58		622
MW142	**17 Nov 2020**	**0082_MW142_201117**	**Normal**	**EP2012739**	0.03	137		133		63		641
MW142	**21 Jun 2021**	**0082_MW142_210621**	**Normal**	**EP2107028**	0.42	226		156		66		647
MW142	**21 Jun 2021**	**0082_QC103_210621**	**Field Duplicate**	**EP2107028**	0.24	182		156		66		753
MW142	**21 Jun 2021**	**0082_QC203_210621**	**Interlab Duplicate**	**805490**	0.46		140		48		790	
MW142	**22 Nov 2021**	**0082_MW142_211122**	**Normal**	**EP2114224**	0.06	153		147		68		829
MW142	**22 Nov 2021**	**0082_QC104_211122**	**Field Duplicate**	**EP2114224**	0.06							
MW142	**22 Nov 2021**	**0082_QC204_211122**	**Interlab Duplicate**	**844500**	0.05							
MW142	**20 Jun 2022**	**0082_MW142_220620**	**Normal**	**EP2207565**	0.63	306		190		73		676
MW142	**20 Jun 2022**	**0082_QC104_220620**	**Field Duplicate**	**EP2207565**	0.64	295		187		71		679
MW142	**20 Jun 2022**	**0082_QC204_220620**	**Interlab Duplicate**	**901186**	0.12							
MW142	**21 Nov 2022**	**0082_MW142_221121**	**Normal**	**EP2215715**	0.16	168		138		59		778
MW142	**26 Jun 2023**	**0082_MW142_230626**	**Normal**	**EP2308618**	0.07	159		133		58		848
MW142	**26 Jun 2023**	**0082_QC103_230626**	**Field Duplicate**	**EP2308618**	0.06	166		139		61		867
MW142	**26 Jun 2023**	**0082_QC203_230626**	**Interlab Duplicate**	**1004374**	0.04							
MW143	**23 Jun 2018**	**0082_MW143_180623**	**Normal**	**212780**	0.042	10		9.0		28		220
MW143	**27 Nov 2019**	**0082_MW143_191127**	**Normal**	**EP1912547**	<0.02	11		11		38		146
MW143	**27 Nov 2019**	**0082_QC102_191127**	**Field Duplicate**	**EP1912547**	0.02	11		12		36		140
MW143	**27 Nov 2019**	**0082_QC202_191127**	**Interlab Duplicate**	**691496**	0.02		13		29		200	
MW143	**23 Jun 2020**	**0082_MW143_200623**	**Normal**	**EP2006519**	0.06	7		6		28		248
MW143	**17 Nov 2020**	**0082_MW143_201117**	**Normal**	**EP2012739**	0.04	8		8		32		245
MW143	**21 Jun 2021**	**0082_MW143_210621**	**Normal**	**EP2107028**	0.06	6		7		31		251
MW143	**23 Nov 2021**	**0082_MW143_211123**	**Normal**	**EP2114293**	0.08	6		6		29		264
MW143	**20 Jun 2022**	**0082_MW143_220620**	**Normal**	**EP2207565**	0.06	9		9		32		228
MW143	**21 Nov 2022**	**0082_MW143_221121**	**Normal**	**EP2215715**	0.02	10		8		30		150
MW143	**26 Jun 2023**	**0082_MW143_230626**	**Normal**	**EP2308618**	0.03	7		7		33		209
MW144S	**23 Jun 2018**	**0082_MW144S_180623**	**Normal**	**212780**	0.26	24		14		23		650
MW144S	**28 Nov 2019**	**0082_MW144_S_191128**	**Normal**	**EP1912606**	0.24	15		10		26		546
MW144S	**25 Jun 2020**	**0082_MW144S_200625**	**Normal**	**EP2006593**	0.22	16		10		28		542
MW144S	**17 Nov 2020**	**0082_MW144_S_201117**	**Normal**	**EP2012739**	0.20	18		10		26		512
MW144S	**17 Nov 2020**	**0082_QC103_201117**	**Field Duplicate**	**EP2012739**	0.20	18		10		26		521
MW144S	**17 Nov 2020**	**0082_QC204_201117**	**Interlab Duplicate**	**758013**	0.18		680		190		8,000	
MW144S	**21 Jun 2021**	**0082_MW144S_210621**	**Normal**	**EP2107033**	0.27	12		8		30		592
MW144S	**22 Nov 2021**	**0082_MW144S_211122**	**Normal**	**EP2114224**	0.29	12		8		23		507
MW144S	**20 Jun 2022**	**0082_MW144S_220620**	**Normal**	**EP2207565**	0.24	18		10		25		455
MW144S	**21 Nov 2022**	**0082_MW144S_221121**	**Normal**	**EP2215643**	0.21	10		7		20		417

					Metals							
					Perfluorobutane sulfonic acid (PFBS)	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
					µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.1	0.1	0.1	0.1	0.1	0.5	0.5
PFAS NEMP 2020 Interim Marine 99%												
PFAS NEMP 2020 Recreational Water												
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**								
MW144S	**21 Nov 2022**	**0082_QC106_221121**	**Field Duplicate**	**EP2215643**	0.19							
MW144S	**21 Nov 2022**	**0082_QC206_221120**	**Interlab Duplicate**	**945158**	0.19							
MW144S	**26 Jun 2023**	**0082_MW144S_230626**	**Normal**	**EP2308607**	0.33	5		5		26		505
MW145	**20 Jun 2018**	**0082_MW145_180620**	**Normal**	**212570**	0.41	510		1,100		350		11,000
MW145	**27 Nov 2019**	**0082_MW145_191127**	**Normal**	**EP1912549**	<0.02	616		1,200		590		10,700
MW145	**25 Jun 2020**	**0082_MW145_200625**	**Normal**	**EP2006593**	<0.02	540		1,100		520		9,890
MW145	**25 Jun 2020**	**0082_QC101_200625**	**Field Duplicate**	**EP2006593**	<0.02	559		1,110		526		10,000
MW145	**25 Jun 2020**	**0082_QC201_200625**	**Interlab Duplicate**	**729348**	<0.01		3,500		1,100		23,000	
MW145	**17 Nov 2020**	**0082_MW145_201117**	**Normal**	**EP2012738**	<0.02	615		1,240		549		10,800
MW145	**21 Jun 2021**	**0082_MW145_210621**	**Normal**	**EP2107028**	<0.02	603		1,320		570		11,500
MW145	**21 Jun 2021**	**0082_QC106_210621**	**Field Duplicate**	**EP2107028**	<0.02	613		1,340		583		11,800
MW145	**21 Jun 2021**	**0082_QC206_210621**	**Interlab Duplicate**	**805490**	<0.01		1,100		390		11,000	
MW145	**22 Nov 2021**	**0082_MW145_211122**	**Normal**	**EP2114227**	<0.02	567		1,160		524		10,700
MW145	**20 Jun 2022**	**0082_MW145_220620**	**Normal**	**EP2207563**	<0.02	566		1,210		522		10,100
MW145	**21 Nov 2022**	**0082_MW145_221121**	**Normal**	**EP2215643**	<0.02	539		1,130		502		10,400
MW145	**21 Nov 2022**	**0082_QC104_221121**	**Field Duplicate**	**EP2215643**	<0.02							
MW145	**21 Nov 2022**	**0082_QC204_221120**	**Interlab Duplicate**	**945158**	<0.01							
MW145	**26 Jun 2023**	**0082_MW145_230626**	**Normal**	**EP2308607**	<0.02	603		1,210		525		10,800
MW147	**21 Jun 2018**	**0082_MW147_180621**	**Normal**	**212780**	<0.001	480		620		190		6,700
MW147	**27 Nov 2019**	**0082_MW147_191127**	**Normal**	**EP1912549**	<0.02	503		887		353		7,390
MW147	**17 Nov 2020**	**0082_MW147_201117**	**Normal**	**EP2012748**	<0.02	528		894		338		7,210
MW147	**22 Jun 2021**	**0082_MW147_210622**	**Normal**	**EP2107183**	<0.02	501		869		346		6,880
MW147	**22 Jun 2021**	**0082_QC107_210622**	**Field Duplicate**	**EP2107183**	<0.02	517		897		353		7,080
MW147	**22 Jun 2021**	**0082_QC207_210622**	**Interlab Duplicate**	**805490**	<0.01		760		220		6,900	
MW147	**22 Nov 2021**	**0082_MW147_211122**	**Normal**	**EP2114227**	<0.02	522		856		316		7,000
MW147	**20 Jun 2022**	**0082_MW147_220620**	**Normal**	**EP2207563**	<0.02	476		774		268		5,660
MW147	**21 Nov 2022**	**0082_MW147_221121**	**Normal**	**EP2215643**	<0.02	462		778		283		6,430
MW147	**26 Jun 2023**	**0082_MW147_230626**	**Normal**	**EP2308608**	<0.02	451		826		312		6,660
MW147	**26 Jun 2023**	**0082_QC101_230626**	**Field Duplicate**	**EP2308608**	<0.02	476		833		308		6,700
MW147	**26 Jun 2023**	**0082_QC201_230626**	**Interlab Duplicate**	**1004374**	<0.01							
MW148S	**21 Jun 2018**	**0082_MW148S_180621**	**Normal**	**212780**	<0.001	490		850		230		8,600
MW148S	**27 Nov 2019**	**0082_MW148S_191127**	**Normal**	**EP1912549**	<0.02	588		1,030		424		8,830
MW148S	**27 Nov 2019**	**0082_QC101_191127**	**Field Duplicate**	**EP1912549**	<0.02	599		1,060		434		9,150
MW148S	**27 Nov 2019**	**0082_QC201_191127**	**Interlab Duplicate**	**691496**	<0.01		950		250		7,800	
MW148S	**23 Jun 2020**	**0082_MW148S_200623**	**Normal**	**EP2006519**	<0.02	514		958		396		8,630
MW148S	**23 Jun 2020**	**0082_QC104_200623**	**Field Duplicate**	**EP2006519**	<0.02	504		954		397		8,570
MW148S	**23 Jun 2020**	**0082_QC204_200623**	**Interlab Duplicate**	**728790**	<0.01		980		290		9,100	
MW148S	**17 Nov 2020**	**0082_MW148S_201117**	**Normal**	**EP2012748**	<0.02	578		1,000		392		8,520
MW148S	**21 Jun 2021**	**0082_MW148S_210621**	**Normal**	**EP2107033**	<0.02	627		1,110		404		9,190
MW148S	**22 Nov 2021**	**0082_MW148S_211122**	**Normal**	**EP2114227**	<0.02	558		957		367		8,290
MW148S	**20 Jun 2022**	**0082_MW148S_220620**	**Normal**	**EP2207563**	<0.02	531		965		362		7,810
MW148S	**21 Nov 2022**	**0082_MW148S_221121**	**Normal**	**EP2215643**	<0.02	545		958		360		8,310
MW148S	**26 Jun 2023**	**0082_MW148S_230626**	**Normal**	**EP2308608**	<0.02	588		1,040		379		8,720
MW151S	**21 Jun 2018**	**0082_MW151S_180621**	**Normal**	**212780**	<0.001	500		1,300		390		12,000
MW151S	**27 Nov 2019**	**0082_MW151S_191127**	**Normal**	**EP1912546**	<0.02	555		1,530		659		11,600
MW151S	**23 Jun 2020**	**0082_MW151S_200623**	**Normal**	**EP2006518**	<0.02	517		1,450		553		11,900
MW151S	**16 Nov 2020**	**0082_MW151_S_201116**	**Normal**	**EP2012737**	<0.02	545		1,520		658		11,800
MW151S	**21 Jun 2021**	**0082_MW151S_210621**	**Normal**	**EP2107024**	<0.02	605		1,590		660		12,100
MW151S	**22 Nov 2021**	**0082_MW151S_211122**	**Normal**	**EP2114227**	<0.02	526		1,360		591		11,000
MW151S	**20 Jun 2022**	**0082_MW151S_220620**	**Normal**	**EP2207564**	<0.02	555		1,470		633		11,000
MW151S	**21 Nov 2022**	**0082_MW151S_221121**	**Normal**	**EP2215643**	<0.02	519		1,380		584		11,000
MW151S	**26 Jun 2023**	**0082_MW151S_230626**	**Normal**	**EP2308608**	<0.02	571		1,500		632		11,700
MW152S	**21 Jun 2018**	**0082_MW152S_180621**	**Normal**	**212780**	<0.001	460		1,100		370		11,000
MW152S	**27 Nov 2019**	**0082_MW152S_191127**	**Normal**	**EP1912546**	<0.02	540		1,310		609		10,500
MW152S	**27 Nov 2019**	**0082_QC105_191127**	**Field Duplicate**	**EP1912546**	<0.02	559		1,360		642		11,200
MW152S	**27 Nov 2019**	**0082_QC205_191127**	**Interlab Duplicate**	**691496**	<0.01		1,100		340		6,800	
MW152S	**23 Jun 2020**	**0082_MW152S_200623**	**Normal**	**EP2006518**	<0.02	488		1,190		498		10,400
MW152S	**16 Nov 2020**	**0082_MW152S_201116**	**Normal**	**EP2012669**	<0.02	521		1,270		580		10,400
MW152S	**22 Jun 2021**	**0082_MW152S_210622**	**Normal**	**EP2107092**	<0.02	527		1,320		618		10,600
MW152S	**22 Nov 2021**	**0082_MW152S_211122**	**Normal**	**EP2114227**	<0.02	543		1,190		560		10,300
MW152S	**20 Jun 2022**	**0082_MW152S_220620**	**Normal**	**EP2207564**	<0.02	522		1,270		594		9,910
MW152S	**21 Nov 2022**	**0082_MW152S_221121**	**Normal**	**EP2215643**	<0.02	518		1,220		541		10,200
MW152S	**26 Jun 2023**	**0082_MW152S_230626**	**Normal**	**EP2308608**	<0.02	574		1,240		556		10,200
MW153S	**22 Jun 2018**	**0082_MW153S_180622**	**Normal**	**212780**	<0.001	470		1,100		330		10,000
MW153S	**28 Nov 2019**	**0082_MW153S_191128**	**Normal**	**EP1912599**	<0.02	551		1,230		515		9,850

	Metals							
	Perfluorobutane sulfonic acid (PFBS)	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting	0.001	0.1	0.1	0.1	0.1	0.1	0.5	0.5
PFAS NEMP 2020 Interim Marine 99%								
PFAS NEMP 2020 Recreational Water								

Location Code	Date	Field ID	Sample Type	Lab Report Number							
MW153S	23 Jun 2020	0082_MW153S_200623	Normal	EP2006518	<0.02	511		1,080		530		9,320
MW153S	16 Nov 2020	0082_MW153S_201116	Normal	EP2012669	<0.02	561		1,180		528		9,520
MW153S	22 Jun 2021	0082_MW153S_210622	Normal	EP2107086	<0.02	539		1,240		560		9,870
MW153S	23 Nov 2021	0082_MW153S_211123	Normal	EP2114294	<0.02	459		1,100		436		8,880
MW153S	20 Jun 2022	0082_MW153S_220620	Normal	EP2207564	<0.02	539		1,220		528		9,170
MW153S	21 Nov 2022	0082_MW153S_221121	Normal	EP2215715	<0.02	495		1,080		466		8,830
MW153S	26 Jun 2023	0082_MW153S_230626	Normal	EP2308608	<0.02	560		1,210		514		9,760
MW154S	20 Jun 2018	0082_MW154S_180620	Normal	212780	0.071	230		390		140		4,200
MW154S	27 Nov 2019	0082_MW154S_191127	Normal	EP1912548	0.07	293		480		186		3,610
MW154S	23 Jun 2020	0082_MW154S_200623	Normal	EP2006549	0.12	359		530		271		4,060
MW154S	16 Nov 2020	0082_MW154S_201116	Normal	EP2012669	0.11	274		492		223		4,320
MW154S	21 Jun 2021	0082_MW154S_210621	Normal	EP2107033	0.13	319		591		266		4,950
MW154S	22 Nov 2021	0082_MW154S_211122	Normal	EP2114227	0.20	337		578		251		5,080
MW154S	20 Jun 2022	0082_MW154S_220620	Normal	EP2207563	0.23	315		599		235		4,670
MW154S	21 Nov 2022	0082_MW154S_221121	Normal	EP2215715	0.21	347		638		250		5,460
MW154S	26 Jun 2023	0082_MW154S_230626	Normal	EP2308618	0.21	334		609		236		5,070
MW155S	22 Jun 2018	0082_MW155S_180622	Normal	212780	<0.001	250		370		110		3,800
MW155S	27 Nov 2019	0082_MW155S_191127	Normal	EP1912548	<0.02	297		452		143		3,650
MW155S	23 Jun 2020	0082_MW155S_200623	Normal	EP2006549	<0.02	429		649		263		5,280
MW155S	16 Nov 2020	0082_MW155S_201116	Normal	EP2012669	<0.02	338		564		198		4,540
MW155S	21 Jun 2021	0082_MW155S_210621	Normal	EP2107024	<0.02	341		560		200		4,630
MW155S	22 Nov 2021	0082_MW155S_211122	Normal	EP2114226	<0.02	330		516		183		4,290
MW155S	20 Jun 2022	0082_MW155S_220620	Normal	EP2207565	<0.02	326		553		193		4,220
MW155S	21 Nov 2022	0082_MW155S_221121	Normal	EP2215643	<0.02	345		562		182		4,570
MW155S	26 Jun 2023	0082_MW155S_230626	Normal	EP2308618	<0.02	349		582		191		4,570
MW310	09 Mar 2018	0082_BDDBO20_180309	Normal	208025	1.4	25		42		36		740
MW310	18 Jun 2018	0082_B020_180618	Normal	212373	1.7	26		42		37		730
MW310	27 Nov 2019	0082_B020_191127	Normal	EP1912547	1.05	23		36		48		754
MW310	27 Nov 2019	0082_QC103_191127	Field Duplicate	EP1912547	1.01	24		36		49		757
MW310	27 Nov 2019	0082_QC203_191127	Interlab Duplicate	691496	0.97		36		32		790	
MW310	23 Jun 2020	0082_MW310_200623	Normal	EP2006519	1.71	26		38		47		673
MW310	17 Nov 2020	0082_MW310_201117	Normal	EP2012739	2.39	34		62		58		894
MW310	21 Jun 2021	0082_MW310_210621	Normal	EP2107028	1.50	28		37		51		565
MW310	22 Nov 2021	0082_MW310_211122	Normal	EP2114224	7.46	21		38		49		765
MW310	20 Jun 2022	0082_MW310_220620	Normal	EP2207565	5.83	31		48		51		616
MW310	21 Nov 2022	0082_MW310_221121	Normal	EP2215715	4.25	24		41		48		574
MW310	26 Jun 2023	0082_MW310_230626	Normal	EP2308618	5.29	23		40		52		707
MW311	18 Jun 2018	0082_B021_180618	Normal	212373	0.023	22		12		21		79
MW311	27 Nov 2019	0082_B021_191127	Normal	EP1912547	0.03	23		12		26		100
MW311	23 Jun 2020	0082_MW311_200623	Normal	EP2006519	0.04	21		13		26		102
MW311	17 Nov 2020	0082_MW311_201117	Normal	EP2012739	0.03	25		13		24		111
MW311	21 Jun 2021	0082_MW311_210621	Normal	EP2107028	<0.02	26		13		19		74
MW311	22 Nov 2021	0082_MW311_211122	Normal	EP2114224	0.03	13		7		16		58
MW311	22 Nov 2021	0082_QC105_211122	Field Duplicate	EP2114224	<0.02							
MW311	22 Nov 2021	0082_QC205_211122	Interlab Duplicate	844500	<0.01							
MW311	20 Jun 2022	0082_MW311_220620	Normal	EP2207565	<0.02	33		15		17		53
MW311	20 Jun 2022	0082_QC105_220620	Field Duplicate	EP2207565	<0.02	32		15		18		53
MW311	20 Jun 2022	0082_QC205_220620	Interlab Duplicate	901186	0.002							
MW311	21 Nov 2022	0082_MW311_221121	Normal	EP2215715	<0.02	12		7		13		44
MW311	21 Nov 2022	0082_QC105_221121	Field Duplicate	EP2215715	<0.02	12		7		13		44
MW311	21 Nov 2022	0082_QC205_221120	Interlab Duplicate	945158	<0.01							
MW311	26 Jun 2023	0082_MW311_230626	Normal	EP2308618	<0.02	32		12		18		39
MW315	22 Feb 2018	0082_BA1_180222	Normal	207359	0.001	4.1		5.4		18		280
MW315	10 Jun 2018	0082_BA1_180610	Normal	212095	0.001	4.2		5.2		18		280
MW315	27 Nov 2019	0082_BA1_191127	Normal	EP1912547	<0.02	3		5		25		302
MW315	25 Jun 2020	0082_MW315_200625	Normal	EP2006593	<0.02	2		5		26		308
MW315	17 Nov 2020	0082_MW315_201117	Normal	EP2012738	<0.02	7		8		25		300
MW315	21 Jun 2021	0082_MW315_210621	Normal	EP2107033	<0.02	5		10		34		354
MW315	22 Nov 2021	0082_MW315_211122	Normal	EP2114224	<0.02	3		3		20		310
MW315	20 Jun 2022	0082_MW315_220620	Normal	EP2207565	<0.02	4		6		24		276
MW315	20 Jun 2022	0082_QC103_220620	Field Duplicate	EP2207565	<0.02	5		7		26		288
MW315	20 Jun 2022	0082_QC203_220620	Interlab Duplicate	901186	<0.002							
MW315	21 Nov 2022	0082_MW315_221121	Normal	EP2215715	<0.02	1		2		22		305
MW315	21 Nov 2022	0082_QC107_221121	Field Duplicate	EP2215715	<0.02	1		2		22		303
MW315	21 Nov 2022	0082_QC207_221120	Interlab Duplicate	945158	<0.01							

						Metals							
						Perfluorobutane sulfonic acid (PFBS)	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.001	0.1	0.1	0.1	0.1	0.1	0.5	0.5
PFAS NEMP 2020 Interim Marine 99%													
PFAS NEMP 2020 Recreational Water													
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**									
MW315	**26 Jun 2023**	**0082_MW315_230626**	**Normal**	**EP2308618**		<0.02	2		3		24		325
MW315	**26 Jun 2023**	**0082_QC104_230626**	**Field Duplicate**	**EP2308618**		<0.02	2		3		25		328
MW315	**26 Jun 2023**	**0082_QC204_230626**	**Interlab Duplicate**	**1004374**		<0.01							
MW326	**22 Feb 2018**	**0082_BB8_180222**	**Normal**	**207359**		0.008	390		780		220		8,500
MW326	**21 Jun 2018**	**0082_BB8_180621**	**Normal**	**212780**		0.008	390		780		230		9,300
MW326	**28 Nov 2019**	**0082_BB8_191128**	**Normal**	**EP1912606**		<0.02	390		895		335		8,930
MW326	**28 Nov 2019**	**0082_QC101_191128**	**Field Duplicate**	**EP1912606**		<0.02	411		936		354		9,240
MW326	**28 Nov 2019**	**0082_QC201_191128**	**Interlab Duplicate**	**691486**		<0.01		740		200		7,200	
MW326	**23 Jun 2020**	**0082_MW326_200623**	**Normal**	**EP2006519**		<0.02	394		799		353		8,410
MW326	**17 Nov 2020**	**0082_MW326_201117**	**Normal**	**EP2012738**		<0.02	443		887		359		8,680
MW326	**17 Nov 2020**	**0082_QC104_201117**	**Field Duplicate**	**EP2012738**		<0.02	435		860		346		8,260
MW326	**17 Nov 2020**	**0082_QC203_201117**	**Interlab Duplicate**	**758013**		0.01		5.1		18		530	
MW326	**21 Jun 2021**	**0082_MW326_210621**	**Normal**	**EP2107028**		<0.02	369		882		333		8,570
MW326	**23 Nov 2021**	**0082_MW326_211123**	**Normal**	**EP2114295**		<0.02	337		781		278		7,590
MW326	**20 Jun 2022**	**0082_MW326_220620**	**Normal**	**EP2207563**		0.02	176		646		291		7,140
MW326	**21 Nov 2022**	**0082_MW326_221121**	**Normal**	**EP2215643**		0.03	237		697		283		7,640
MW326	**26 Jun 2023**	**0082_MW326_230626**	**Normal**	**EP2308607**		<0.02	343		808		314		8,120
MW326	**26 Jun 2023**	**0082_QC102_230626**	**Field Duplicate**	**EP2308607**		<0.02							
MW326	**26 Jun 2023**	**0082_QC202_230626**	**Interlab Duplicate**	**1004374**		0.01							

First time detectionof PFOA or PFHxS+PFOS

New exceedance of guideline value

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids								
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Interim Marine 99%					0.00023						19				
PFAS NEMP 2020 Recreational Water											**10**				
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**											
OTH101	**26 Feb 2018**	**0082_OTH101_180226**	**Normal**	**207529**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH101	**26 Feb 2018**	**0082_QC113_180226**	**Field Duplicate**	**207529**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH101	**26 Feb 2018**	**0082_QC213_180226**	**Interlab Duplicate**	**588073**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
OTH101	**21 Jun 2018**	**0082_OTH101_A_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH101	**21 Jun 2018**	**0082_OTH101_B_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH101	**28 Nov 2019**	**0082_OTH101_191128**	**Normal**	**EP1912609**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH101	**26 Jun 2020**	**0082_OTH101_200626**	**Normal**	**EP2006685**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH101	**16 Nov 2020**	**0082_OTH101_201116**	**Normal**	**EP2012670**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH101	**21 Jun 2021**	**0082_OTH101_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH101	**22 Nov 2021**	**0082_OTH101_211122**	**Normal**	**EP2114224**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH101	**20 Jun 2022**	**0082_OTH101_220620**	**Normal**	**EP2207566**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH101	**20 Nov 2022**	**0082_OTH101_221120**	**Normal**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH101	**26 Jun 2023**	**0082_OTH101_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH102	**26 Feb 2018**	**0082_OTH102_180226**	**Normal**	**207529**	<0.001	<0.001	<0.001	<0.001	0.006	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH102	**21 Jun 2018**	**0082_OTH102_A_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH102	**21 Jun 2018**	**0082_OTH102_B_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH102	**28 Nov 2019**	**0082_OTH102_191128**	**Normal**	**EP1912609**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH102	**26 Jun 2020**	**0082_OTH102_200626**	**Normal**	**EP2006685**	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH102	**16 Nov 2020**	**0082_OTH102_201116**	**Normal**	**EP2012670**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH102	**21 Jun 2021**	**0082_OTH102_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH102	**22 Nov 2021**	**0082_OTH102_211122**	**Normal**	**EP2114224**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH102	**20 Jun 2022**	**0082_OTH102_220620**	**Normal**	**EP2207566**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH102	**20 Nov 2022**	**0082_OTH102_221120**	**Normal**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH102	**20 Nov 2022**	**0082_QC102_221120**	**Field Duplicate**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH102	**20 Nov 2022**	**0082_QC202_221120**	**Interlab Duplicate**	**945158**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
OTH102	**26 Jun 2023**	**0082_OTH102_230626**	**Normal**	**EP2308610**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH103	**26 Feb 2018**	**0082_OTH103_180226**	**Normal**	**207529**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH103	**21 Jun 2018**	**0082_OTH103_A_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH103	**21 Jun 2018**	**0082_OTH103_B_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH103	**28 Nov 2019**	**0082_OTH103_191128**	**Normal**	**EP1912609**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH103	**26 Jun 2020**	**0082_OTH103_200626**	**Normal**	**EP2006685**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH103	**16 Nov 2020**	**0082_OTH103_201116**	**Normal**	**EP2012670**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH103	**21 Jun 2021**	**0082_OTH103_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH103	**22 Nov 2021**	**0082_OTH103_211122**	**Normal**	**EP2114224**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH103	**20 Jun 2022**	**0082_OTH103_220620**	**Normal**	**EP2207566**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH103	**20 Nov 2022**	**0082_OTH103_221120**	**Normal**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH103	**26 Jun 2023**	**0082_OTH103_230626**	**Normal**	**EP2308610**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH104	**26 Feb 2018**	**0082_OTH104_180226**	**Normal**	**207529**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH104	**21 Jun 2018**	**0082_OTH104_A_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH104	**21 Jun 2018**	**0082_OTH104_B_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH104	**28 Nov 2019**	**0082_OTH104_191128**	**Normal**	**EP1912609**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH104	**28 Nov 2019**	**0082_QC102_191128**	**Field Duplicate**	**EP1912609**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH104	**28 Nov 2019**	**0082_QC202_191128**	**Interlab Duplicate**	**691486**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
OTH104	**26 Jun 2020**	**0082_OTH104_200626**	**Normal**	**EP2006685**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH104	**16 Nov 2020**	**0082_OTH104_201116**	**Normal**	**EP2012670**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH104	**21 Jun 2021**	**0082_OTH104_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH104	**22 Nov 2021**	**0082_OTH104_211122**	**Normal**	**EP2114224**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH104	**20 Jun 2022**	**0082_OTH104_220620**	**Normal**	**EP2207566**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH104	**20 Nov 2022**	**0082_OTH104_221120**	**Normal**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH104	**26 Jun 2023**	**0082_OTH104_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH105	**21 Feb 2018**	**0082_QC1119_180221**	**Field Duplicate**	**207287**	<0.001	<0.001	0.006	<0.001	0.067	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH105	**26 Feb 2018**	**0082_OTH105_180226**	**Normal**	**207529**	<0.001	<0.001	0.002	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH105	**21 Jun 2018**	**0082_OTH105_A_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH105	**21 Jun 2018**	**0082_OTH105_B_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH105	**28 Nov 2019**	**0082_OTH105_191128**	**Normal**	**EP1912609**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH105	**26 Jun 2020**	**0082_OTH105_200626**	**Normal**	**EP2006685**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH105	**16 Nov 2020**	**0082_OTH105_201116**	**Normal**	**EP2012670**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH105	**21 Jun 2021**	**0082_OTH105_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH105	**22 Nov 2021**	**0082_OTH105_211122**	**Normal**	**EP2114224**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH105	**20 Jun 2022**	**0082_OTH105_220620**	**Normal**	**EP2207566**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH105	**20 Nov 2022**	**0082_OTH105_221120**	**Normal**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH105	**26 Jun 2023**	**0082_OTH105_230626**	**Normal**	**EP2308610**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH106	**26 Feb 2018**	**0082_OTH106_180226**	**Normal**	**207529**	<0.001	<0.001	<0.001	<0.001	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH106	**21 Jun 2018**	**0082_OTH106_A_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005
OTH106	**21 Jun 2018**	**0082_OTH106_B_180621**	**Normal**	**212780**	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids								
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
PFAS NEMP 2020 Interim Marine 99%					0.00023						19				
PFAS NEMP 2020 Recreational Water											**10**				
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**											
OTH106	**21 Jun 2018**	**0082_QC772_180621**	**Interlab Duplicate**	**605977**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
OTH106	**28 Nov 2019**	**0082_OTH106_191128**	**Normal**	**EP1912609**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH106	**26 Jun 2020**	**0082_OTH106_200626**	**Normal**	**EP2006685**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH106	**16 Nov 2020**	**0082_OTH106_201116**	**Normal**	**EP2012670**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH106	**21 Jun 2021**	**0082_OTH106_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH106	**22 Nov 2021**	**0082_OTH106_211122**	**Normal**	**EP2114224**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH106	**20 Jun 2022**	**0082_OTH106_220620**	**Normal**	**EP2207566**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH106	**20 Nov 2022**	**0082_OTH106_221120**	**Normal**	**EP2215641**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02
OTH106	**26 Jun 2023**	**0082_OTH106_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02

First time detectionof PFOA or PFHxS+PFOS

New exceedance of guideline value

				PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							
	Perfluorobutane sulfonic acid (PFBS)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.001
PFAS NEMP 2020 Interim Marine 99%															
PFAS NEMP 2020 Recreational Water															**2**

Location Code	Date	Field ID	Sample Type	Lab Report Number													
OTH101	26 Feb 2018	0082_OTH101_180226	Normal	207529	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	
OTH101	26 Feb 2018	0082_QC113_180226	Field Duplicate	207529	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	
OTH101	26 Feb 2018	0082_QC213_180226	Interlab Duplicate	588073	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
OTH101	21 Jun 2018	0082_OTH101_A_180621	Normal	212780	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
OTH101	21 Jun 2018	0082_OTH101_B_180621	Normal	212780	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
OTH101	28 Nov 2019	0082_OTH101_191128	Normal	EP1912609	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH101	26 Jun 2020	0082_OTH101_200626	Normal	EP2006685	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH101	16 Nov 2020	0082_OTH101_201116	Normal	EP2012670	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH101	21 Jun 2021	0082_OTH101_210621	Normal	EP2107024	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH101	22 Nov 2021	0082_OTH101_211122	Normal	EP2114224	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH101	20 Jun 2022	0082_OTH101_220620	Normal	EP2207566	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH101	20 Nov 2022	0082_OTH101_221120	Normal	EP2215641	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH101	26 Jun 2023	0082_OTH101_230626	Normal	EP2308607	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH102	26 Feb 2018	0082_OTH102_180226	Normal	207529	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	
OTH102	21 Jun 2018	0082_OTH102_A_180621	Normal	212780	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
OTH102	21 Jun 2018	0082_OTH102_B_180621	Normal	212780	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
OTH102	28 Nov 2019	0082_OTH102_191128	Normal	EP1912609	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH102	26 Jun 2020	0082_OTH102_200626	Normal	EP2006685	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01
OTH102	16 Nov 2020	0082_OTH102_201116	Normal	EP2012670	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH102	21 Jun 2021	0082_OTH102_210621	Normal	EP2107024	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH102	22 Nov 2021	0082_OTH102_211122	Normal	EP2114224	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH102	20 Jun 2022	0082_OTH102_220620	Normal	EP2207566	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH102	20 Nov 2022	0082_OTH102_221120	Normal	EP2215641	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH102	20 Nov 2022	0082_QC102_221120	Field Duplicate	EP2215641	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH102	20 Nov 2022	0082_QC202_221120	Interlab Duplicate	945158	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
OTH102	26 Jun 2023	0082_OTH102_230626	Normal	EP2308610	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH103	26 Feb 2018	0082_OTH103_180226	Normal	207529	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	
OTH103	21 Jun 2018	0082_OTH103_A_180621	Normal	212780	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
OTH103	21 Jun 2018	0082_OTH103_B_180621	Normal	212780	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
OTH103	28 Nov 2019	0082_OTH103_191128	Normal	EP1912609	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH103	26 Jun 2020	0082_OTH103_200626	Normal	EP2006685	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH103	16 Nov 2020	0082_OTH103_201116	Normal	EP2012670	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH103	21 Jun 2021	0082_OTH103_210621	Normal	EP2107024	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH103	22 Nov 2021	0082_OTH103_211122	Normal	EP2114224	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH103	20 Jun 2022	0082_OTH103_220620	Normal	EP2207566	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH103	20 Nov 2022	0082_OTH103_221120	Normal	EP2215641	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH103	26 Jun 2023	0082_OTH103_230626	Normal	EP2308610	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH104	26 Feb 2018	0082_OTH104_180226	Normal	207529	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	
OTH104	21 Jun 2018	0082_OTH104_A_180621	Normal	212780	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
OTH104	21 Jun 2018	0082_OTH104_B_180621	Normal	212780	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
OTH104	28 Nov 2019	0082_OTH104_191128	Normal	EP1912609	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH104	28 Nov 2019	0082_QC102_191128	Field Duplicate	EP1912609	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH104	28 Nov 2019	0082_QC202_191128	Interlab Duplicate	691486	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
OTH104	26 Jun 2020	0082_OTH104_200626	Normal	EP2006685	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH104	16 Nov 2020	0082_OTH104_201116	Normal	EP2012670	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH104	21 Jun 2021	0082_OTH104_210621	Normal	EP2107024	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH104	22 Nov 2021	0082_OTH104_211122	Normal	EP2114224	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH104	20 Jun 2022	0082_OTH104_220620	Normal	EP2207566	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH104	20 Nov 2022	0082_OTH104_221120	Normal	EP2215641	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH104	26 Jun 2023	0082_OTH104_230626	Normal	EP2308607	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH105	21 Feb 2018	0082_QC1119_180221	Field Duplicate	207287	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	
OTH105	26 Feb 2018	0082_OTH105_180226	Normal	207529	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	
OTH105	21 Jun 2018	0082_OTH105_A_180621	Normal	212780	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
OTH105	21 Jun 2018	0082_OTH105_B_180621	Normal	212780	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
OTH105	28 Nov 2019	0082_OTH105_191128	Normal	EP1912609	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH105	26 Jun 2020	0082_OTH105_200626	Normal	EP2006685	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH105	16 Nov 2020	0082_OTH105_201116	Normal	EP2012670	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH105	21 Jun 2021	0082_OTH105_210621	Normal	EP2107024	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH105	22 Nov 2021	0082_OTH105_211122	Normal	EP2114224	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH105	20 Jun 2022	0082_OTH105_220620	Normal	EP2207566	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH105	20 Nov 2022	0082_OTH105_221120	Normal	EP2215641	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH105	26 Jun 2023	0082_OTH105_230626	Normal	EP2308610	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH106	26 Feb 2018	0082_OTH106_180226	Normal	207529	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	
OTH106	21 Jun 2018	0082_OTH106_A_180621	Normal	212780	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001
OTH106	21 Jun 2018	0082_OTH106_B_180621	Normal	212780	<0.001	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001

				PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							
	Perfluorobutane sulfonic acid (PFBS)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.001
PFAS NEMP 2020 Interim Marine 99%															
PFAS NEMP 2020 Recreational Water															**2**
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**											
OTH106	**21 Jun 2018**	**0082_QC772_180621**	**Interlab Duplicate**	**605977**	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01
OTH106	**28 Nov 2019**	**0082_OTH106_191128**	**Normal**	**EP1912609**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH106	**26 Jun 2020**	**0082_OTH106_200626**	**Normal**	**EP2006685**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH106	**16 Nov 2020**	**0082_OTH106_201116**	**Normal**	**EP2012670**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH106	**21 Jun 2021**	**0082_OTH106_210621**	**Normal**	**EP2107024**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH106	**22 Nov 2021**	**0082_OTH106_211122**	**Normal**	**EP2114224**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH106	**20 Jun 2022**	**0082_OTH106_220620**	**Normal**	**EP2207566**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH106	**20 Nov 2022**	**0082_OTH106_221120**	**Normal**	**EP2215641**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01
OTH106	**26 Jun 2023**	**0082_OTH106_230626**	**Normal**	**EP2308607**	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01

First time detectionof PFOA or PFHxS+PFOS

New exceedance of guideline value

				PFAS			Inorganics											
				Perfluorobutane sulfonic acid (PFBS)	Sum of PFAS (WA DER List)	Sum of PFAS	Hardness	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Sulphate	Calcium
				µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L
LOR - Limit of Reporting				0.001	0.001	0.001	3	1	1	1	1	0.01	0.01	1	0.01	1	1	0.1
PFAS NEMP 2020 Interim Marine 99%																		
PFAS NEMP 2020 Recreational Water																		
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
OTH101	**26 Feb 2018**	**0082_OTH101_180226**	**Normal**	**207529**	<0.001			6,900		380					20,000	1.9		3,300	
OTH101	**26 Feb 2018**	**0082_QC113_180226**	**Field Duplicate**	**207529**	<0.001			6,800		120					20,000	-0.19		3,300	
OTH101	**26 Feb 2018**	**0082_QC213_180226**	**Interlab Duplicate**	**588073**	<0.01	<0.05	<0.1		<10	320	<10	320			22,000			2,400	400
OTH101	**21 Jun 2018**	**0082_OTH101_A_180621**	**Normal**	**212780**	<0.001		<0.001	8,500		130					21,000	14		2,700	
OTH101	**21 Jun 2018**	**0082_OTH101_B_180621**	**Normal**	**212780**	<0.001		<0.001	7,200		130					21,000	6.7		2,600	
OTH101	**28 Nov 2019**	**0082_OTH101_191128**	**Normal**	**EP1912609**	<0.02	<0.01	<0.01		<1	136	<1	136	634	754	20,200	8.61	2,980		
OTH101	**26 Jun 2020**	**0082_OTH101_200626**	**Normal**	**EP2006685**	<0.02	<0.01	<0.01		<1	128	<1	128	632	654	20,200	1.76	2,840		
OTH101	**16 Nov 2020**	**0082_OTH101_201116**	**Normal**	**EP2012670**	<0.02	<0.01	<0.01		<1	116	<1	116	644	684	20,500	3.02	3,070		
OTH101	**21 Jun 2021**	**0082_OTH101_210621**	**Normal**	**EP2107024**	<0.02	<0.01	<0.01		<1	119	<1	119	580	643	18,700	5.16	2,420		
OTH101	**22 Nov 2021**	**0082_OTH101_211122**	**Normal**	**EP2114224**	<0.02	<0.01	<0.01		<1	120	<1	120	582	657	18,600	6.04	2,630		
OTH101	**20 Jun 2022**	**0082_OTH101_220620**	**Normal**	**EP2207566**	<0.02	<0.01	<0.01		<1	126	<1	126	572	624	18,400	4.34	2,420		
OTH101	**20 Nov 2022**	**0082_OTH101_221120**	**Normal**	**EP2215641**	<0.02	<0.01	<0.01		<1	136	<1	136	605	676	19,300	5.52	2,780		
OTH101	**26 Jun 2023**	**0082_OTH101_230626**	**Normal**	**EP2308607**	<0.02	<0.01	<0.01		<1	127	<1	127	582	691	18,500	8.54	2,780		
OTH102	**26 Feb 2018**	**0082_OTH102_180226**	**Normal**	**207529**	<0.001			7,000		1,200					20,000	1.8		3,300	
OTH102	**21 Jun 2018**	**0082_OTH102_A_180621**	**Normal**	**212780**	<0.001		<0.001	7,600		120					21,000	7.0		2,700	
OTH102	**21 Jun 2018**	**0082_OTH102_B_180621**	**Normal**	**212780**	<0.001		<0.001	6,500		120					22,000	-1.2		2,800	
OTH102	**28 Nov 2019**	**0082_OTH102_191128**	**Normal**	**EP1912609**	<0.02	<0.01	<0.01		<1	129	<1	129	621	710	19,800	6.70	2,890		
OTH102	**26 Jun 2020**	**0082_OTH102_200626**	**Normal**	**EP2006685**	<0.02	0.01	0.01		<1	125	<1	125	627	656	20,100	2.27	2,780		
OTH102	**16 Nov 2020**	**0082_OTH102_201116**	**Normal**	**EP2012670**	<0.02	<0.01	<0.01		<1	124	<1	124	640	693	20,400	4.01	2,960		
OTH102	**21 Jun 2021**	**0082_OTH102_210621**	**Normal**	**EP2107024**	<0.02	<0.01	<0.01		<1	133	<1	133	584	649	18,800	5.24	2,460		
OTH102	**22 Nov 2021**	**0082_OTH102_211122**	**Normal**	**EP2114224**	<0.02	<0.01	<0.01		<1	111	<1	111	599	713	19,200	8.68	2,670		
OTH102	**20 Jun 2022**	**0082_OTH102_220620**	**Normal**	**EP2207566**	<0.02	<0.01	<0.01		<1	200	<1	200	576	655	18,500	6.41	2,420		
OTH102	**20 Nov 2022**	**0082_OTH102_221120**	**Normal**	**EP2215641**	<0.02	<0.01	<0.01		<1	132	<1	132	605	647	19,300	3.38	2,770		
OTH102	**20 Nov 2022**	**0082_QC102_221120**	**Field Duplicate**	**EP2215641**	<0.02	<0.01	<0.01												
OTH102	**20 Nov 2022**	**0082_QC202_221120**	**Interlab Duplicate**	**945158**	<0.01	<0.05	<0.1												
OTH102	**26 Jun 2023**	**0082_OTH102_230626**	**Normal**	**EP2308610**	<0.02	<0.01	<0.01		<1	333	<1	333	559	650	17,700	7.50	2,550		
OTH103	**26 Feb 2018**	**0082_OTH103_180226**	**Normal**	**207529**	<0.001			6,900		880					20,000	0.36		3,300	
OTH103	**21 Jun 2018**	**0082_OTH103_A_180621**	**Normal**	**212780**	<0.001		<0.001	7,500		130					22,000	6.0		2,800	
OTH103	**21 Jun 2018**	**0082_OTH103_B_180621**	**Normal**	**212780**	<0.001		<0.001	7,100		130					21,000	5.1		2,700	
OTH103	**28 Nov 2019**	**0082_OTH103_191128**	**Normal**	**EP1912609**	<0.02	<0.01	<0.01		<1	126	<1	126	631	747	20,200	8.45	2,810		
OTH103	**26 Jun 2020**	**0082_OTH103_200626**	**Normal**	**EP2006685**	<0.02	<0.01	<0.01		<1	129	<1	129	626	643	20,000	1.32	2,860		
OTH103	**16 Nov 2020**	**0082_OTH103_201116**	**Normal**	**EP2012670**	<0.02	<0.01	<0.01		<1	122	<1	122	640	692	20,400	3.95	2,960		
OTH103	**21 Jun 2021**	**0082_OTH103_210621**	**Normal**	**EP2107024**	<0.02	<0.01	<0.01		<1	129	<1	129	595	611	19,000	1.32	2,730		
OTH103	**22 Nov 2021**	**0082_OTH103_211122**	**Normal**	**EP2114224**	<0.02	<0.01	<0.01		<1	128	<1	128	601	689	19,200	6.82	2,740		
OTH103	**20 Jun 2022**	**0082_OTH103_220620**	**Normal**	**EP2207566**	<0.02	<0.01	<0.01		<1	133	<1	133	578	653	18,600	6.08	2,450		
OTH103	**20 Nov 2022**	**0082_OTH103_221120**	**Normal**	**EP2215641**	<0.02	<0.01	<0.01		<1	132	<1	132	610	668	19,500	4.49	2,780		
OTH103	**26 Jun 2023**	**0082_OTH103_230626**	**Normal**	**EP2308610**	<0.02	<0.01	<0.01		<1	274	<1	274	566	672	18,000	8.55	2,550		
OTH104	**26 Feb 2018**	**0082_OTH104_180226**	**Normal**	**207529**	<0.001			7,100		800					20,000	4.6		3,200	
OTH104	**21 Jun 2018**	**0082_OTH104_A_180621**	**Normal**	**212780**	<0.001		<0.001	8,600		120					22,000	13		2,800	
OTH104	**21 Jun 2018**	**0082_OTH104_B_180621**	**Normal**	**212780**	<0.001		<0.001	6,700		120					22,000	0.90		2,800	
OTH104	**28 Nov 2019**	**0082_OTH104_191128**	**Normal**	**EP1912609**	<0.02	<0.01	<0.01		<1	170	<1	170	634	765	20,200	9.36	2,920		
OTH104	**28 Nov 2019**	**0082_QC102_191128**	**Field Duplicate**	**EP1912609**	<0.02	<0.01	<0.01		<1	118	<1	118	618	701	19,700	6.30	2,860		
OTH104	**28 Nov 2019**	**0082_QC202_191128**	**Interlab Duplicate**	**691486**	<0.01	<0.05	<0.1		<10	340					21,000			3,000	440
OTH104	**26 Jun 2020**	**0082_OTH104_200626**	**Normal**	**EP2006685**	<0.02	<0.01	<0.01		<1	135	<1	135	641	648	20,500	0.53	2,900		
OTH104	**16 Nov 2020**	**0082_OTH104_201116**	**Normal**	**EP2012670**	<0.02	<0.01	<0.01		<1	127	<1	127	646	731	20,500	6.22	3,110		
OTH104	**21 Jun 2021**	**0082_OTH104_210621**	**Normal**	**EP2107024**	<0.02	<0.01	<0.01		<1	135	<1	135	583	696	18,700	8.78	2,550		
OTH104	**22 Nov 2021**	**0082_OTH104_211122**	**Normal**	**EP2114224**	<0.02	<0.01	<0.01		<1	111	<1	111	603	690	19,200	6.71	2,860		
OTH104	**20 Jun 2022**	**0082_OTH104_220620**	**Normal**	**EP2207566**	<0.02	<0.01	<0.01		<1	247	<1	247	592	616	19,000	2.02	2,460		
OTH104	**20 Nov 2022**	**0082_OTH104_221120**	**Normal**	**EP2215641**	<0.02	<0.01	<0.01		<1	134	<1	134	610	670	19,500	4.68	2,750		
OTH104	**26 Jun 2023**	**0082_OTH104_230626**	**Normal**	**EP2308607**	<0.02	<0.01	<0.01		<1	127	<1	127	575	662	18,300	7.08	2,690		
OTH105	**21 Feb 2018**	**0082_QC1119_180221**	**Field Duplicate**	**207287**	<0.001														
OTH105	**26 Feb 2018**	**0082_OTH105_180226**	**Normal**	**207529**	<0.001			7,000		640					20,000	2.6		3,300	
OTH105	**21 Jun 2018**	**0082_OTH105_A_180621**	**Normal**	**212780**	<0.001		<0.001	6,600		120					22,000	0.20		2,800	
OTH105	**21 Jun 2018**	**0082_OTH105_B_180621**	**Normal**	**212780**	<0.001		<0.001	6,500		120					22,000	-1.0		2,800	
OTH105	**28 Nov 2019**	**0082_OTH105_191128**	**Normal**	**EP1912609**	<0.02	<0.01	<0.01		<1	129	<1	129	613	706	19,600	7.07	2,750		
OTH105	**26 Jun 2020**	**0082_OTH105_200626**	**Normal**	**EP2006685**	<0.02	<0.01	<0.01		<1	132	<1	132	635	678	20,300	3.29	2,850		
OTH105	**16 Nov 2020**	**0082_OTH105_201116**	**Normal**	**EP2012670**	<0.02	<0.01	<0.01		<1	121	<1	121	642	710	20,400	4.98	3,100		
OTH105	**21 Jun 2021**	**0082_OTH105_210621**	**Normal**	**EP2107024**	<0.02	<0.01	<0.01		<1	134	<1	134	597	690	19,200	7.22	2,520		
OTH105	**22 Nov 2021**	**0082_OTH105_211122**	**Normal**	**EP2114224**	<0.02	<0.01	<0.01		<1	116	<1	116	620	754	19,900	9.73	2,720		
OTH105	**20 Jun 2022**	**0082_OTH105_220620**	**Normal**	**EP2207566**	<0.02	<0.01	<0.01		<1	129	<1	129	580	630	18,600	4.15	2,550		
OTH105	**20 Nov 2022**	**0082_OTH105_221120**	**Normal**	**EP2215641**	<0.02	<0.01	<0.01		<1	129	<1	129	605	688	19,300	6.49	2,770		
OTH105	**26 Jun 2023**	**0082_OTH105_230626**	**Normal**	**EP2308610**	<0.02	<0.01	<0.01		<1	206	<1	206	559	640	17,800	6.76	2,530		
OTH106	**26 Feb 2018**	**0082_OTH106_180226**	**Normal**	**207529**	<0.001			7,100		530					20,000	4.1		3,300	
OTH106	**21 Jun 2018**	**0082_OTH106_A_180621**	**Normal**	**212780**	<0.001		<0.001	6,700		130					21,000	0.61		2,700	
OTH106	**21 Jun 2018**	**0082_OTH106_B_180621**	**Normal**	**212780**	<0.001		<0.001	6,200		130					22,000	-3.2		2,800	

	PFAS			Inorganics											
	Perfluorobutane sulfonic acid (PFBS)	Sum of PFAS (WA DER List)	Sum of PFAS	Hardness	Carbonate Alkalinity (as CaCO3)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Sulphate	Calcium
	µg/L	µg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L
LOR - Limit of Reporting	0.001	0.001	0.001	3	1	1	1	1	0.01	0.01	1	0.01	1	1	0.1
PFAS NEMP 2020 Interim Marine 99%															
PFAS NEMP 2020 Recreational Water															
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**											
OTH106	**21 Jun 2018**	**0082_QC772_180621**	**Interlab Duplicate**	**605977**	<0.01	<0.05	<0.1		<10	130		130			19,000			2,400	470
OTH106	**28 Nov 2019**	**0082_OTH106_191128**	**Normal**	**EP1912609**	<0.02	<0.01	<0.01		<1	115	<1	115	601	705	19,200	7.91	2,760		
OTH106	**26 Jun 2020**	**0082_OTH106_200626**	**Normal**	**EP2006685**	<0.02	<0.01	<0.01		<1	214	<1	214	639	655	20,400	1.24	2,840		
OTH106	**16 Nov 2020**	**0082_OTH106_201116**	**Normal**	**EP2012670**	<0.02	<0.01	<0.01		<1	120	<1	120	647	698	20,600	3.79	3,060		
OTH106	**21 Jun 2021**	**0082_OTH106_210621**	**Normal**	**EP2107024**	<0.02	<0.01	<0.01		<1	162	<1	162	596	713	19,200	8.92	2,480		
OTH106	**22 Nov 2021**	**0082_OTH106_211122**	**Normal**	**EP2114224**	<0.02	<0.01	<0.01		<1	118	<1	118	598	696	19,100	7.56	2,720		
OTH106	**20 Jun 2022**	**0082_OTH106_220620**	**Normal**	**EP2207566**	<0.02	<0.01	<0.01		<1	125	<1	125	574	624	18,500	4.17	2,380		
OTH106	**20 Nov 2022**	**0082_OTH106_221120**	**Normal**	**EP2215641**	<0.02	<0.01	<0.01		<1	132	<1	132	598	631	19,100	2.67	2,720		
OTH106	**26 Jun 2023**	**0082_OTH106_230626**	**Normal**	**EP2308607**	<0.02	<0.01	<0.01		<1	125	<1	125	578	650	18,400	5.92	2,700		

First time detectionof PFOA or PFHxS+PFOS

New exceedance of guideline value

					Metals							
					Perfluorobutane sulfonic acid (PFBS)	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
					µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	0.1	0.1	0.1	0.1	0.1	0.5	0.5
PFAS NEMP 2020 Interim Marine 99%												
PFAS NEMP 2020 Recreational Water												
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**								
OTH101	**26 Feb 2018**	**0082_OTH101_180226**	**Normal**	**207529**	<0.001	440		1,400		430		12,000
OTH101	**26 Feb 2018**	**0082_QC113_180226**	**Field Duplicate**	**207529**	<0.001	450		1,400		430		11,000
OTH101	**26 Feb 2018**	**0082_QC213_180226**	**Interlab Duplicate**	**588073**	<0.01		1,200		390		15,000	
OTH101	**21 Jun 2018**	**0082_OTH101_A_180621**	**Normal**	**212780**	<0.001	540		1,700		520		16,000
OTH101	**21 Jun 2018**	**0082_OTH101_B_180621**	**Normal**	**212780**	<0.001	460		1,500		440		13,000
OTH101	**28 Nov 2019**	**0082_OTH101_191128**	**Normal**	**EP1912609**	<0.02	536		1,760		666		13,000
OTH101	**26 Jun 2020**	**0082_OTH101_200626**	**Normal**	**EP2006685**	<0.02	481		1,460		551		11,400
OTH101	**16 Nov 2020**	**0082_OTH101_201116**	**Normal**	**EP2012670**	<0.02	475		1,540		646		11,900
OTH101	**21 Jun 2021**	**0082_OTH101_210621**	**Normal**	**EP2107024**	<0.02	473		1,480		591		11,100
OTH101	**22 Nov 2021**	**0082_OTH101_211122**	**Normal**	**EP2114224**	<0.02	461		1,480		624		11,400
OTH101	**20 Jun 2022**	**0082_OTH101_220620**	**Normal**	**EP2207566**	<0.02	458		1,460		604		10,700
OTH101	**20 Nov 2022**	**0082_OTH101_221120**	**Normal**	**EP2215641**	<0.02	477		1,490		624		11,800
OTH101	**26 Jun 2023**	**0082_OTH101_230626**	**Normal**	**EP2308607**	<0.02	504		1,550		639		12,000
OTH102	**26 Feb 2018**	**0082_OTH102_180226**	**Normal**	**207529**	<0.001	440		1,400		440		12,000
OTH102	**21 Jun 2018**	**0082_OTH102_A_180621**	**Normal**	**212780**	<0.001	480		1,600		450		14,000
OTH102	**21 Jun 2018**	**0082_OTH102_B_180621**	**Normal**	**212780**	<0.001	410		1,300		390		12,000
OTH102	**28 Nov 2019**	**0082_OTH102_191128**	**Normal**	**EP1912609**	<0.02	522		1,600		697		12,300
OTH102	**26 Jun 2020**	**0082_OTH102_200626**	**Normal**	**EP2006685**	<0.02	479		1,470		618		11,400
OTH102	**16 Nov 2020**	**0082_OTH102_201116**	**Normal**	**EP2012670**	<0.02	483		1,580		661		12,000
OTH102	**21 Jun 2021**	**0082_OTH102_210621**	**Normal**	**EP2107024**	<0.02	476		1,490		594		11,200
OTH102	**22 Nov 2021**	**0082_OTH102_211122**	**Normal**	**EP2114224**	<0.02	493		1,570		618		12,500
OTH102	**20 Jun 2022**	**0082_OTH102_220620**	**Normal**	**EP2207566**	<0.02	498		1,540		642		11,200
OTH102	**20 Nov 2022**	**0082_OTH102_221120**	**Normal**	**EP2215641**	<0.02	454		1,430		596		11,300
OTH102	**20 Nov 2022**	**0082_QC102_221120**	**Field Duplicate**	**EP2215641**	<0.02							
OTH102	**20 Nov 2022**	**0082_QC202_221120**	**Interlab Duplicate**	**945158**	<0.01							
OTH102	**26 Jun 2023**	**0082_OTH102_230626**	**Normal**	**EP2308610**	<0.02	467		1,510		587		11,200
OTH103	**26 Feb 2018**	**0082_OTH103_180226**	**Normal**	**207529**	<0.001	440		1,400		420		12,000
OTH103	**21 Jun 2018**	**0082_OTH103_A_180621**	**Normal**	**212780**	<0.001	480		1,500		450		14,000
OTH103	**21 Jun 2018**	**0082_OTH103_B_180621**	**Normal**	**212780**	<0.001	450		1,500		430		13,000
OTH103	**28 Nov 2019**	**0082_OTH103_191128**	**Normal**	**EP1912609**	<0.02	528		1,740		650		12,900
OTH103	**26 Jun 2020**	**0082_OTH103_200626**	**Normal**	**EP2006685**	<0.02	470		1,440		544		11,200
OTH103	**16 Nov 2020**	**0082_OTH103_201116**	**Normal**	**EP2012670**	<0.02	483		1,570		657		12,000
OTH103	**21 Jun 2021**	**0082_OTH103_210621**	**Normal**	**EP2107024**	<0.02	457		1,420		581		10,500
OTH103	**22 Nov 2021**	**0082_OTH103_211122**	**Normal**	**EP2114224**	<0.02	477		1,540		653		12,000
OTH103	**20 Jun 2022**	**0082_OTH103_220620**	**Normal**	**EP2207566**	<0.02	478		1,530		637		11,200
OTH103	**20 Nov 2022**	**0082_OTH103_221120**	**Normal**	**EP2215641**	<0.02	466		1,460		613		11,700
OTH103	**26 Jun 2023**	**0082_OTH103_230626**	**Normal**	**EP2308610**	<0.02	480		1,500		621		11,700
OTH104	**26 Feb 2018**	**0082_OTH104_180226**	**Normal**	**207529**	<0.001	450		1,500		440		13,000
OTH104	**21 Jun 2018**	**0082_OTH104_A_180621**	**Normal**	**212780**	<0.001	540		1,800		520		16,000
OTH104	**21 Jun 2018**	**0082_OTH104_B_180621**	**Normal**	**212780**	<0.001	430		1,400		410		12,000
OTH104	**28 Nov 2019**	**0082_OTH104_191128**	**Normal**	**EP1912609**	<0.02	543		1,780		672		13,200
OTH104	**28 Nov 2019**	**0082_QC102_191128**	**Field Duplicate**	**EP1912609**	<0.02	515		1,590		695		12,100
OTH104	**28 Nov 2019**	**0082_QC202_191128**	**Interlab Duplicate**	**691486**	<0.01		1,500		390		12,000	
OTH104	**26 Jun 2020**	**0082_OTH104_200626**	**Normal**	**EP2006685**	<0.02	470		1,450		544		11,300
OTH104	**16 Nov 2020**	**0082_OTH104_201116**	**Normal**	**EP2012670**	<0.02	504		1,650		696		12,700
OTH104	**21 Jun 2021**	**0082_OTH104_210621**	**Normal**	**EP2107024**	<0.02	514		1,600		638		12,000
OTH104	**22 Nov 2021**	**0082_OTH104_211122**	**Normal**	**EP2114224**	<0.02	479		1,550		654		12,000
OTH104	**20 Jun 2022**	**0082_OTH104_220620**	**Normal**	**EP2207566**	<0.02	485		1,450		634		10,500
OTH104	**20 Nov 2022**	**0082_OTH104_221120**	**Normal**	**EP2215641**	<0.02	469		1,480		618		11,700
OTH104	**26 Jun 2023**	**0082_OTH104_230626**	**Normal**	**EP2308607**	<0.02	480		1,490		610		11,500
OTH105	**21 Feb 2018**	**0082_QC1119_180221**	**Field Duplicate**	**207287**	<0.001							
OTH105	**26 Feb 2018**	**0082_OTH105_180226**	**Normal**	**207529**	<0.001	450		1,400		430		12,000
OTH105	**21 Jun 2018**	**0082_OTH105_A_180621**	**Normal**	**212780**	<0.001	420		1,400		400		12,000
OTH105	**21 Jun 2018**	**0082_OTH105_B_180621**	**Normal**	**212780**	<0.001	410		1,300		390		12,000
OTH105	**28 Nov 2019**	**0082_OTH105_191128**	**Normal**	**EP1912609**	<0.02	517		1,600		694		12,200
OTH105	**26 Jun 2020**	**0082_OTH105_200626**	**Normal**	**EP2006685**	<0.02	499		1,520		570		11,800
OTH105	**16 Nov 2020**	**0082_OTH105_201116**	**Normal**	**EP2012670**	<0.02	498		1,610		679		12,300
OTH105	**21 Jun 2021**	**0082_OTH105_210621**	**Normal**	**EP2107024**	<0.02	505		1,590		626		11,900
OTH105	**22 Nov 2021**	**0082_OTH105_211122**	**Normal**	**EP2114224**	<0.02	524		1,660		671		13,200
OTH105	**20 Jun 2022**	**0082_OTH105_220620**	**Normal**	**EP2207566**	<0.02	466		1,480		615		10,800
OTH105	**20 Nov 2022**	**0082_OTH105_221120**	**Normal**	**EP2215641**	<0.02	487		1,530		641		12,000
OTH105	**26 Jun 2023**	**0082_OTH105_230626**	**Normal**	**EP2308610**	<0.02	462		1,500		584		11,000
OTH106	**26 Feb 2018**	**0082_OTH106_180226**	**Normal**	**207529**	<0.001	450		1,500		440		13,000
OTH106	**21 Jun 2018**	**0082_OTH106_A_180621**	**Normal**	**212780**	<0.001	420		1,400		400		12,000
OTH106	**21 Jun 2018**	**0082_OTH106_B_180621**	**Normal**	**212780**	<0.001	400		1,300		380		11,000

						Metals							
						Perfluorobutane sulfonic acid (PFBS)	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
						µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting						0.001	0.1	0.1	0.1	0.1	0.1	0.5	0.5
PFAS NEMP 2020 Interim Marine 99%													
PFAS NEMP 2020 Recreational Water													
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**									
OTH106	**21 Jun 2018**	**0082_QC772_180621**	**Interlab Duplicate**	**605977**		<0.01		1,500		470		11,000	
OTH106	**28 Nov 2019**	**0082_OTH106_191128**	**Normal**	**EP1912609**		<0.02	515		1,590		684		12,200
OTH106	**26 Jun 2020**	**0082_OTH106_200626**	**Normal**	**EP2006685**		<0.02	480		1,470		553		11,400
OTH106	**16 Nov 2020**	**0082_OTH106_201116**	**Normal**	**EP2012670**		<0.02	485		1,590		660		12,100
OTH106	**21 Jun 2021**	**0082_OTH106_210621**	**Normal**	**EP2107024**		<0.02	530		1,640		658		12,300
OTH106	**22 Nov 2021**	**0082_OTH106_211122**	**Normal**	**EP2114224**		<0.02	481		1,560		658		12,100
OTH106	**20 Jun 2022**	**0082_OTH106_220620**	**Normal**	**EP2207566**		<0.02	458		1,460		603		10,700
OTH106	**20 Nov 2022**	**0082_OTH106_221120**	**Normal**	**EP2215641**		<0.02	447		1,400		580		11,000
OTH106	**26 Jun 2023**	**0082_OTH106_230626**	**Normal**	**EP2308607**		<0.02	470		1,460		600		11,300

First time detectionof PFOA or PFHxS+PFOS

New exceedance of guideline value

Table 7 - Surface Water Analytical results

Harold E Holt Area B

	PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids											PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides							PFAS				
	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFAS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS	Hardness	Carbonate Alkalinity (as CaCO3)
	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mg/L	mg/L
LOR - Limit of Reporting	0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.004	0.004	0.002	0.005	0.004	0.002	0.008	0.001	0.001	0.001	3	1
PFAS NEMP 2020 Interim Marine 99%					0.00023						19																						
PFAS NEMP 2020 Recreational Water											**10**																		**2**				

Location Code	Date	Field ID	Sample Type	Lab Report Number																															
SW161	25 Feb 2018	0082_SW161_180225	Normal	207529	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	0.01	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05				23,000	
SW161	23 Jun 2018	0082_SW161_180623	Normal	212780	<0.001	<0.001	<0.001	<0.001	0.008	<0.002	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.008		0.01	5,000	
SW161	26 May 2020	0082_SW161_200526	Normal	EP2005403	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW161	23 Jun 2020	0082_SW161_200623	Normal	EP2006451	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		30
SW161	03 Mar 2021	0082_SW161_210303	Normal	EP2102193	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW161	21 Jun 2021	0082_SW161_210621	Normal	EP2107025	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW161	22 Nov 2021	0082_SW161_211122	Normal	EP2114225	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW161	16 May 2022	0082_SW161_220516	Normal	EP2205862	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW161	20 Jun 2022	0082_SW161_220620	Normal	EP2207566	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW162	25 Feb 2018	0082_SW162_180225	Normal	207529	<0.001	<0.001	<0.001	<0.001	0.003	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05				17,000	
SW162	23 Jun 2018	0082_SW162_180623	Normal	212780	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	<0.001		<0.001	5,200	
SW162	26 May 2020	0082_SW162_200526	Normal	EP2005403	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW162	23 Jun 2020	0082_SW162_200623	Normal	EP2006451	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW162	03 Mar 2021	0082_SW162_210303	Normal	EP2102193	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW162	21 Jun 2021	0082_SW162_210621	Normal	EP2107025	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW162	22 Nov 2021	0082_QC101_211122	Field Duplicate	EP2114225	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW162	22 Nov 2021	0082_QC201_211122	Interlab Duplicate	844500	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1		
SW162	22 Nov 2021	0082_SW162_211122	Normal	EP2114225	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW162	16 May 2022	0082_SW162_220516	Normal	EP2205862	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW162	20 Jun 2022	0082_SW162_220620	Normal	EP2207566	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW163	23 Feb 2018	0082_SW163_180223	Normal	207359	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.05	<0.1	<0.5	<0.01	<0.01	<0.01	<0.01	<0.1	<0.05	<0.02	<0.1	<0.05	<0.02	<0.5				24,000	
SW163	23 Jun 2018	0082_QC776_180623	Interlab Duplicate	605977	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1		<10
SW163	23 Jun 2018	0082_SW163_180623	Normal	212780	<0.001	<0.001	<0.001	<0.001	0.008	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.008		0.008	5,200	
SW163	26 May 2020	0082_QC101_200526	Field Duplicate	EP2005403	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW163	26 May 2020	0082_QC201_200526	Interlab Duplicate	723152	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1		<10
SW163	26 May 2020	0082_SW163_200526	Normal	EP2005403	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW163	23 Jun 2020	0082_QC102_200623	Field Duplicate	EP2006451	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW163	23 Jun 2020	0082_SW163_200623	Normal	EP2006451	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW163	03 Mar 2021	0082_SW163_210303	Normal	EP2102193	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW163	21 Jun 2021	0082_SW163_210621	Field Duplicate	EP2107025	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW163	21 Jun 2021	0082_QC201_210621	Interlab Duplicate	805490	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1		<10
SW163	21 Jun 2021	0082_SW163_210621	Normal	EP2107025	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW163	22 Nov 2021	0082_SW163_211122	Normal	EP2114225	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW163	16 May 2022	0082_SW163_220516	Normal	EP2205862	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW163	20 Jun 2022	0082_SW163_220620	Normal	EP2207566	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW164	12 Mar 2018	0082_SW164_180312	Normal	208025	0.003	0.004	0.026	0.003	0.13	<0.002	0.022	0.040	0.038	0.011	0.010	0.005	0.003	<0.002	<0.005	<0.01	<0.05	<0.001	0.049	0.047	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.20			41	
SW164	19 Jun 2018	0082_SW164_180619	Normal	212570	0.002	0.002	0.012	0.001	0.056	<0.002	0.005	0.01	0.012	0.004	0.003	0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	0.027	0.016	<0.001	<0.01	<0.01	<0.004	<0.01	<0.02	<0.004	<0.1				39	
SW164	25 May 2020	0082_SW164_200525	Normal	EP2005398	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	0.04	0.04		<1
SW164	16 May 2022	0082_QC101_220516	Field Duplicate	EP2205862	<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.10	0.10	0.10		
SW164	16 May 2022	0082_QC201_220516	Interlab Duplicate	890769	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.1	<0.05	<0.05	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.05	<0.05		
SW164	16 May 2022	0082_SW164_220516	Normal	EP2205862	<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.10	0.10	0.10		<1
SW164	20 Jun 2022	0082_QC101_220620	Field Duplicate	EP2207562	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02		<1
SW164	20 Jun 2022	0082_QC201_220620	Interlab Duplicate	901186	<0.002	<0.002	0.006	<0.002	0.018	<0.004	<0.008	0.004	0.005	0.008	0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.008	<0.008	0.003	<0.004	<0.004	<0.004	<0.004	<0.008	<0.004	<0.004	<0.008	0.024	0.045	0.045		
SW164	20 Jun 2022	0082_SW164_220620	Normal	EP2207562	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	0.02	0.02		<1
SW181	08 Jun 2018	0082_SW181_180608	Normal	212095	<0.001	<0.001	<0.001	<0.001	0.005	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.005	<0.01	<0.05	<0.001	<0.001	<0.001	<0.001	<0.01	<0.005	<0.002	<0.005	<0.01	<0.002	<0.05	0.005			7,900	
SW181	28 Nov 2019	0082_SW181_191128	Normal	EP1912602	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		86
SW181	26 May 2020	0082_SW181_200526	Normal	EP2005403	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW181	23 Jun 2020	0082_SW181_200623	Normal	EP2006521	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW181	16 Nov 2020	0082_SW181_201116	Normal	EP2012672	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		36
SW181	17 Nov 2020	0082_QC102_201117	Field Duplicate	EP2012740	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW181	17 Nov 2020	0082_QC202_201117	Interlab Duplicate	758013	<0.01	<0.01	0.07	<0.01	<0.01	<0.01	<0.05	0.02	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	0.14	0.14		<10
SW181	03 Mar 2021	0082_QC101_210303	Field Duplicate	EP2102193	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW181	03 Mar 2021	0082_QC201_210303	Interlab Duplicate	779272	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.3	0.31	0.31		
SW181	03 Mar 2021	0082_SW181_210303	Normal	EP2102193	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW181	21 Jun 2021	0082_SW181_210621	Normal	EP2107025	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW181	22 Nov 2021	0082_SW181_211122	Normal	EP2114225	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW181	16 May 2022	0082_SW181_220516	Normal	EP2205862	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW181	20 Jun 2022	0082_SW181_220620	Normal	EP2207566	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW181	20 Nov 2022	0082_QC102_221120	Field Duplicate	EP2215641	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW181	20 Nov 2022	0082_QC203_221120	Interlab Duplicate	945158	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01	<0.01	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.1		
SW181	20 Nov 2022	0082_SW181_221120	Normal	EP2215641	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW181	26 Jun 2023	0082_QC107_230626	Field Duplicate	EP2308620	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.01	<0.01	<0.01		<1
SW181	26 Jun 2023	0082_QC207_230626	Interlab Duplicate	1004374	<0.01

Table 7 - Surface Water Analytical results

Harold E Holt Area B

					Inorganics								Metals								
					Perfluorobutane sulfonic acid (PFBS)	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Ionic Balance	Sulphate as SO4 - Turbidimetric (filtered)	Sulphate	Calcium	Calcium (filtered)	Magnesium	Magnesium (filtered)	Potassium	Potassium (filtered)	Sodium	Sodium (filtered)
					µg/L	mg/L	mg/L	mg/L	meq/L	meq/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR - Limit of Reporting					0.001	1	1	1	0.01	0.01	1	0.01	1	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
PFAS NEMP 2020 Interim Marine 99%																						
PFAS NEMP 2020 Recreational Water																						
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**																		
SW161	**25 Feb 2018**	**0082_SW161_180225**	**Normal**	**207529**	<0.001	170					76,000	1.7		10,000		1,000		4,900		1,500		45,000
SW161	**23 Jun 2018**	**0082_SW161_180623**	**Normal**	**212780**	<0.001	62					13,000	2.8		2,400		540		890		270		8,000
SW161	**26 May 2020**	**0082_SW161_200526**	**Normal**	**EP2005403**	<0.02	124	<1	124	636	705	20,200	5.16	3,040			605		1,540		672		12,200
SW161	**23 Jun 2020**	**0082_SW161_200623**	**Normal**	**EP2006451**	<0.02	101	<1	131	1,340	1,730	42,300	12.5	7,120			1,930		3,890		1,440		29,300
SW161	**03 Mar 2021**	**0082_SW161_210303**	**Normal**	**EP2102193**	<0.02	78	<1	78	461	500	14,400	4.07	2,560			647		1,010		452		8,580
SW161	**21 Jun 2021**	**0082_SW161_210621**	**Normal**	**EP2107025**	<0.02	80	<1	80	103	107	3,210	1.98	530			123		228		94		1,840
SW161	**22 Nov 2021**	**0082_SW161_211122**	**Normal**	**EP2114225**	<0.02	210	<1	210	1,790	2,000	57,300	5.48	8,050			1,230		4,190		1,770		35,500
SW161	**16 May 2022**	**0082_SW161_220516**	**Normal**	**EP2205862**	<0.02	108	<1	108	614	649	19,200	2.83	3,360			755		1,480		619		10,900
SW161	**20 Jun 2022**	**0082_SW161_220620**	**Normal**	**EP2207566**	<0.02	105	<1	105	94.0	95.0	2,880	0.52	512			127		214		90		1,580
SW162	**25 Feb 2018**	**0082_SW162_180225**	**Normal**	**207529**	<0.001	260					54,000	2.4		6,800		810		3,600		1,100		32,000
SW162	**23 Jun 2018**	**0082_SW162_180623**	**Normal**	**212780**	<0.001	67					13,000	6.0		2,400		550		930		280		8,500
SW162	**26 May 2020**	**0082_SW162_200526**	**Normal**	**EP2005403**	<0.02	124	<1	124	623	687	19,800	4.87	2,980			587		1,500		644		11,900
SW162	**23 Jun 2020**	**0082_SW162_200623**	**Normal**	**EP2006451**	<0.02	119	<1	119	1,300	1,650	41,000	11.9	6,650			1,800		3,710		1,390		28,000
SW162	**03 Mar 2021**	**0082_SW162_210303**	**Normal**	**EP2102193**	<0.02	125	<1	125	630	701	19,800	5.32	3,330			719		1,530		680		12,000
SW162	**21 Jun 2021**	**0082_SW162_210621**	**Normal**	**EP2107025**	<0.02	89	<1	89	104	106	3,260	0.46	519			119		224		94		1,810
SW162	**22 Nov 2021**	**0082_QC101_211122**	**Field Duplicate**	**EP2114225**	<0.02																	
SW162	**22 Nov 2021**	**0082_QC201_211122**	**Interlab Duplicate**	**844500**	<0.01																	
SW162	**22 Nov 2021**	**0082_SW162_211122**	**Normal**	**EP2114225**	<0.02	306	<1	306	1,300	1,510	41,300	7.27	6,300			1,110		3,300		1,220		26,400
SW162	**16 May 2022**	**0082_SW162_220516**	**Normal**	**EP2205862**	<0.02	53	<1	53	620	603	19,400	1.40	3,440			705		1,380		576		10,100
SW162	**20 Jun 2022**	**0082_SW162_220620**	**Normal**	**EP2207566**	<0.02	106	<1	107	93.9	94.8	2,880	0.47	507			126		213		89		1,580
SW163	**23 Feb 2018**	**0082_SW163_180223**	**Normal**	**207359**	<0.01	200					75,000	3.5		11,000		880		5,300		1,000		46,000
SW163	**23 Jun 2018**	**0082_QC776_180623**	**Interlab Duplicate**	**605977**	<0.01	81		84			13,000			2,200	480		830		260		7,600	
SW163	**23 Jun 2018**	**0082_SW163_180623**	**Normal**	**212780**	<0.001	76					13,000	5.7		2,500		540		930		270		8,400
SW163	**26 May 2020**	**0082_QC101_200526**	**Field Duplicate**	**EP2005403**	<0.02	126	<1	126	638	710	20,300	5.38	3,020			620		1,550		667		12,300
SW163	**26 May 2020**	**0082_QC201_200526**	**Interlab Duplicate**	**723152**	<0.01	190					23,000			3,300	660		1,500		490		10,000	
SW163	**26 May 2020**	**0082_SW163_200526**	**Normal**	**EP2005403**	<0.02	125	<1	125	629	722	20,000	6.87	3,000			616		1,580		683		12,500
SW163	**23 Jun 2020**	**0082_QC102_200623**	**Field Duplicate**	**EP2006451**	<0.02	125	<1	125	1,270	1,600	39,900	11.5	6,680			1,780		3,560		1,350		27,100
SW163	**23 Jun 2020**	**0082_SW163_200623**	**Normal**	**EP2006451**	<0.02	125	<1	125	1,260	1,530	40,000	9.54	6,220			1,700		3,420		1,300		25,900
SW163	**03 Mar 2021**	**0082_SW163_210303**	**Normal**	**EP2102193**	<0.02	132	<1	132	625	731	19,600	7.84	3,320			763		1,590		718		12,500
SW163	**21 Jun 2021**	**0082_QC101_210621**	**Field Duplicate**	**EP2107025**	<0.02	88	<1	88	110	110	3,440	0.10	546			122		234		93		1,890
SW163	**21 Jun 2021**	**0082_QC201_210621**	**Interlab Duplicate**	**805490**	<0.01	87	<20	87			3,100			500	130		250		87		2,100	
SW163	**21 Jun 2021**	**0082_SW163_210621**	**Normal**	**EP2107025**	<0.02	87	<1	87	111	111	3,460	0.05	546			123		235		97		1,900
SW163	**22 Nov 2021**	**0082_SW163_211122**	**Normal**	**EP2114225**	<0.02	119	<1	119	3,310	3,990	103,000	9.38	19,200			773		7,160		2,460		75,900
SW163	**16 May 2022**	**0082_SW163_220516**	**Normal**	**EP2205862**	<0.02	129	<1	129	716	722	22,400	0.45	3,900			786		1,640		677		12,200
SW163	**20 Jun 2022**	**0082_SW163_220620**	**Normal**	**EP2207568**	<0.02	103	<1	103	97.7	96.6	3,020	0.53	501			129		217		91		1,610
SW164	**12 Mar 2018**	**0082_SW164_180312**	**Normal**	**208025**	0.003	41					23	-4.4		7		13		2.4		2.6		13
SW164	**19 Jun 2018**	**0082_SW164_180619**	**Normal**	**212570**	0.002	38					8	1.4		<1		14		1.2		0.6		5.2
SW164	**25 May 2020**	**0082_SW164_200525**	**Normal**	**EP2005398**	<0.02	32	<1	32	0.98	1.10	9		4			13		2		1		6
SW164	**16 May 2022**	**0082_QC101_220516**	**Field Duplicate**	**EP2205862**	<0.02	54	<1	54	1.28	1.16	7	4.94	<1			15		2		1		5
SW164	**16 May 2022**	**0082_QC201_220516**	**Interlab Duplicate**	**890769**	<0.1																	
SW164	**16 May 2022**	**0082_SW164_220516**	**Normal**	**EP2205862**	<0.02	58	<1	58	1.38	1.21	8	6.89	<1			16		2		1		5
SW164	**20 Jun 2022**	**0082_QC101_220620**	**Field Duplicate**	**EP2207562**	<0.02	27	<1	27	0.65	0.49	4		<1			8		<1		<1		2
SW164	**20 Jun 2022**	**0082_QC201_220620**	**Interlab Duplicate**	**901186**	<0.002																	
SW164	**20 Jun 2022**	**0082_SW164_220620**	**Normal**	**EP2207562**	<0.02	28	<1	28	0.67	0.49	4		<1			8		<1		<1		2
SW181	**08 Jun 2018**	**0082_SW181_180608**	**Normal**	**212095**	<0.001	130					26,000	-0.39		3,500		530		1,600		510		15,000
SW181	**28 Nov 2019**	**0082_SW181_191128**	**Normal**	**EP1912602**	<0.02	105	<1	192	2,280	2,930	74,300	12.6	8,460			1,640		6,600		2,340		51,700
SW181	**26 May 2020**	**0082_SW181_200526**	**Normal**	**EP2005403**	<0.02	123	<1	123	644	713	20,600	5.03	2,930			505		1,590		680		12,400
SW181	**23 Jun 2020**	**0082_SW181_200623**	**Normal**	**EP2006521**	<0.02	191	<1	191	850	1,030	27,000	9.83	4,040			707		2,230		784		18,300
SW181	**16 Nov 2020**	**0082_SW181_201116**	**Normal**	**EP2012672**	<0.02	111	<1	147	2,000	2,400	64,600	9.07	8,500			1,580		5,450		2,020		41,900
SW181	**17 Nov 2020**	**0082_QC102_201117**	**Field Duplicate**	**EP2012740**	<0.02	162	<1	162	1,800	2,120	57,800	8.06	8,020			1,410		4,720		2,220		36,800
SW181	**17 Nov 2020**	**0082_QC202_201117**	**Interlab Duplicate**	**758013**	<0.01	180	<20	180			73,000			9,400	1,700		4,600		1,700		37,000	
SW181	**03 Mar 2021**	**0082_QC101_210303**	**Field Duplicate**	**EP2102193**	<0.02	107	<1	107	813	923	25,800	6.31	4,000			731		2,010		975		16,000
SW181	**03 Mar 2021**	**0082_QC201_210303**	**Interlab Duplicate**	**779272**	<0.01																	
SW181	**03 Mar 2021**	**0082_SW181_210303**	**Normal**	**EP2102193**	<0.02	103	<1	103	789	939	25,000	8.67	3,930			737		2,040		986		16,300
SW181	**21 Jun 2021**	**0082_SW181_210621**	**Normal**	**EP2107025**	<0.02	172	<1	172	605	723	19,500	8.87	2,470			519		1,600		668		12,600
SW181	**22 Nov 2021**	**0082_SW181_211122**	**Normal**	**EP2114225**	<0.02	179	<1	179	680	741	21,700	4.30	3,100			524		1,610		672		13,000
SW181	**16 May 2022**	**0082_SW181_220516**	**Normal**	**EP2205862**	<0.02	178	<1	178	593	590	18,900	0.24	2,690			449		1,380		571		10,100
SW181	**20 Jun 2022**	**0082_SW181_220620**	**Normal**	**EP2207566**	<0.02	157	<1	157	552	625	17,800	6.21	2,240			472		1,460		619		10,700
SW181	**20 Nov 2022**	**0082_QC103_221120**	**Field Duplicate**	**EP2215641**	<0.02																	
SW181	**20 Nov 2022**	**0082_QC203_221120**	**Interlab Duplicate**	**945158**	<0.01																	
SW181	**20 Nov 2022**	**0082_SW181_221120**	**Normal**	**EP2215641**	<0.02	208	<1	208	1,320	1,510	42,100	6.89	5,960			947		3,400		1,210		26,500
SW181	**26 Jun 2023**	**0082_QC107_230626**	**Field Duplicate**	**EP2308620**	<0.02	173	<1	173	560	668	17,700	8.77	2,760			486		1,500		614		11,600
SW181	**26 Jun 2023**	**0082_QC207_230626**	**Interlab Duplicate**	**1004374**	<0.01																	
SW181	**26 Jun 2023**	**0082_SW181_230626**	**Normal**	**EP2308620**	<0.02	173	<1	173	556	679	17,800	9.90	2,440			492		1,570		624		11,700

First time detectionof PFOA or PFHxS+PFOS

New exceedance of guideline value

					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
					Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
SD163	2/23/2018	0082_QC1207_180223	Field Duplicate	207359	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SD163	2/23/2018	0082_QC2207_180223	Interlab Duplicate	587299	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SD163	2/23/2018	0082_SS163_0.0_180223	Normal	207359	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SD163	2/23/2018	0082_SS163_0.4_180223	Normal	207359	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SD163	6/23/2018	0082_SS163_0.0_180623	Normal	212780	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SD163	6/23/2018	0082_SS163_0.4_180623	Normal	212780	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SD163	5/26/2020	0082_SD163_200526	Normal	EP2005402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD163	6/23/2020	0082_SD163_0.00-0.10_200623	Normal	EP2006517	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD163	11/16/2020	0082_QC101_201116	Field Duplicate	EP2012674	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD163	11/16/2020	0082_QC201_201116	Interlab Duplicate	758013	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SD163	11/16/2020	0082_SD163_201116	Normal	EP2012674	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD163	3/3/2021	0082_SD163_210303	Normal	EP2102200	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD163	6/21/2021	0082_QC102_210621	Field Duplicate	EP2107026	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD163	6/21/2021	0082_QC202_210621	Interlab Duplicate	805490	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SD163	6/21/2021	0082_SD163_210621	Normal	EP2107026	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD163	11/22/2021	0082_QC102_211122	Field Duplicate	EP2114223	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD163	11/22/2021	0082_QC202_211122	Interlab Duplicate	844500	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SD163	11/22/2021	0082_SD163_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD163	5/16/2022	0082_SD163_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD163	6/20/2022	0082_SD163_220620	Normal	EP2207569	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD163	11/20/2022	0082_SD163_221120	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD163	6/26/2023	0082_SD163_230626	Normal	EP2308609	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD181	28 Nov 2019	0082_SD181_0.00-0.10_191128	Normal	EP1912601	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD181	26 May 2020	0082_SD181_200526	Normal	EP2005402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD181	23 Jun 2020	0082_SD181_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD181	16 Nov 2020	0082_SD181_201116	Normal	EP2012673	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD181	03 Mar 2021	0082_SD181_210303	Normal	EP2102192	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD181	21 Jun 2021	0082_SD181_210621	Normal	EP2107026	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD181	22 Nov 2021	0082_SD181_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD181	16 May 2022	0082_QC102_220516	Field Duplicate	EP2205861	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD181	16 May 2022	0082_QC202_220516	Interlab Duplicate	890769	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002	<0.0002
SD181	16 May 2022	0082_SD181_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD181	20 Jun 2022	0082_SD181_220620	Normal	EP2207567	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD181	20 Nov 2022	0082_SD181_221120	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SD181	26 Jun 2023	0082_SD181_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS161	2/25/2018	0082_QC208_180225	Interlab Duplicate	588073	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS161	2/25/2018	0082_QC1208_180225	Field Duplicate	207529	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS161	2/25/2018	0082_QC2208_180225	Interlab Duplicate	588710	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS161	2/25/2018	0082_SS161_0.0_180225	Normal	207529	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS161	2/25/2018	0082_SS161_0.4_180225	Normal	207529	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS161	6/23/2018	0082_SS161_0.0_180623	Normal	212780	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS161	6/23/2018	0082_SS161_0.4_180623	Normal	212780	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS161	11/27/2019	0082_SS161_191127	Normal	EP1912545	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS161	5/26/2020	0082_SD161_200526	Normal	EP2005402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS161	6/23/2020	0082_SD161_0.00-0.10_200623	Normal	EP2006517	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS161	11/16/2020	0082_SD161_0.00-0.10_201116	Normal	EP2012674	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS161	3/3/2021	0082_SD161_210303	Normal	EP2102200	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS161	6/21/2021	0082_SD161_210621	Normal	EP2107026	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS161	11/22/2021	0082_SD161_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS161	5/16/2022	0082_SD161_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS161	6/20/2022	0082_QC107_220620	Field Duplicate	EP2207567	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS161	6/20/2022	0082_QC207_220620	Interlab Duplicate	901186	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002	<0.0002
SS161	6/20/2022	0082_SD161_220620	Normal	EP2207567	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS161	11/20/2022	0082_SD161_221120	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS161	6/26/2023	0082_SD161_230626	Normal	EP2308609	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	2/25/2018	0082_SS162_0.0_180225	Normal	207529	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS162	2/25/2018	0082_SS162_0.5_180225	Normal	207529	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS162	6/23/2018	0082_SS162_0.0_180623	Normal	212780	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS162	6/23/2018	0082_SS162_0.4_180623	Normal	212780	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS162	11/27/2019	0082_SS162_191127	Normal	EP1912545	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	5/26/2020	0082_SD162_200526	Normal	EP2005402	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	6/23/2020	0082_QC101_0.00-0.10_200623	Field Duplicate	EP2006517	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	6/23/2020	0082_-SD162_0.00-0.10_200623	Normal	EP2006517	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	11/16/2020	0082_SD162_201116	Normal	EP2012674	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	3/3/2021	0082_SD162_210303	Normal	EP2102200	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	6/21/2021	0082_SD162_210621	Normal	EP2107026	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	11/22/2021	0082_SD162_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
					Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
SS162	5/16/2022	0082_SD162_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	6/20/2022	0082_SD162_220620	Normal	EP2207567	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	11/20/2022	0082_QC101_221120	Field Duplicate	EP2215642	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	11/20/2022	0082_QC201_221120	Interlab Duplicate	945158	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	11/20/2022	0082_SD162_221120	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	6/26/2023	0082_QC106_230626	Field Duplicate	EP2308609	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS162	6/26/2023	0082_QC206_230626	Interlab Duplicate	1004374	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS162	6/26/2023	0082_SD162_230626	Normal	EP2308609	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS164	14 Feb 2018	0082_SS164_0.0_180214	Normal	206929	<0.0001	<0.0001	0.0003	<0.0001	0.0028	<0.0002	<0.0002	<0.0002	0.0002	0.0001	0.0002	<0.0001	<0.0005	<0.0005
SS164	14 Feb 2018	0082_SS164_0.4_180214	Normal	206929	<0.0001	0.0001	0.0008	<0.0001	0.0062	0.0006	<0.0002	0.0007	0.0008	0.0006	0.0006	0.0001	<0.0005	<0.0005
SS164	08 Jun 2018	0082_SS164_0.0_180608	Normal	211877	<0.0001	<0.0001	0.0002	<0.0001	0.0026	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	0.0001	<0.0001	<0.0005	<0.0005
SS164	08 Jun 2018	0082_SS164_0.5_180608	Normal	211877	<0.0001	<0.0001	<0.0001	<0.0001	0.0011	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS164	27 Nov 2019	0082_SS164_191127	Normal	EP1912552	<0.0002	<0.0002	<0.0002	<0.0002	0.0028	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS164	25 May 2020	0082_SD164_200525	Normal	EP2005401	<0.0002	<0.0002	<0.0002	<0.0002	0.0046	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS164	23 Jun 2020	0082_SD164_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0002	0.0010	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS164	16 Nov 2020	0082_SD164_201116	Normal	EP2012671	<0.0002	<0.0002	0.0002	<0.0002	0.0345	<0.0002	<0.001	0.0007	0.0008	0.0003	0.0004	0.0004	<0.0002	<0.0002
SS164	03 Mar 2021	0082_QC102_210303	Field Duplicate	EP2102200	<0.0002	<0.0002	0.0005	<0.0002	0.0060	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0003
SS164	03 Mar 2021	0082_QC202_210303	Interlab Duplicate	779272	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS164	03 Mar 2021	0082_SD164_210303	Normal	EP2102200	<0.0002	<0.0002	0.0007	<0.0002	0.0099	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0003
SS164	21 Jun 2021	0082_QC105_210621	Field Duplicate	EP2107034	<0.0002	<0.0002	<0.0002	<0.0002	0.0047	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.0002
SS164	21 Jun 2021	0082_QC205_210621	Interlab Duplicate	805490	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS164	21 Jun 2021	0082_SD164_210621	Normal	EP2107034	<0.0002	<0.0002	<0.0002	<0.0002	0.0034	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002
SS164	22 Nov 2021	0082_SD164_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0002	0.0031	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	0.0011	<0.0002	<0.0002
SS164	16 May 2022	0082_QC100_220516	Field Duplicate	EP2205861	<0.0002	<0.0002	0.0003	<0.0002	0.0013	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS164	16 May 2022	0082_QC200_220516	Interlab Duplicate	890769	<0.0004	<0.0004	<0.0004	<0.0004	0.0006	<0.0004	<0.0008	0.0004	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002	<0.0002
SS164	16 May 2022	0082_SD164_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0002	0.0013	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS164	20 Jun 2022	0082_SD164_220620	Normal	EP2207561	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS164	21 Nov 2022	0082_QC108_221121	Field Duplicate	EP2215716	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS164	21 Nov 2022	0082_QC208_221120	Interlab Duplicate	945158	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS164	21 Nov 2022	0082_SD164_221121	Normal	EP2215716	<0.0002	<0.0002	0.0002	<0.0002	0.0007	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS164	26 Jun 2023	0082_QC105_230626	Field Duplicate	EP2308619	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS164	26 Jun 2023	0082_QC205_230626	Interlab Duplicate	1004374	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS164	26 Jun 2023	0082_SS164_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS165	14 Feb 2018	0082_SS165_0.0_180214	Normal	206929	<0.0001	<0.0001	<0.0001	<0.0001	0.0007	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS165	14 Feb 2018	0082_SS165_0.4_180214	Normal	206929	<0.0001	<0.0001	0.0002	<0.0001	0.0022	0.001	<0.0002	<0.0002	<0.0001	0.0001	0.0003	0.0001	<0.0005	<0.0005
SS165	27 Nov 2019	0082_SS165_191127	Normal	EP1912550	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS165	28 May 2020	0082_SS165_200528	Normal	EP2005659	<0.0002	<0.0002	0.0005	<0.0002	0.0023	0.0008	<0.001	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.0002	<0.0002
SS165	23 Jun 2020	0082_SS165_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0002	0.0058	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS165	16 Nov 2020	0082_SS165_201116	Normal	EP2012671	<0.0002	<0.0002	0.0008	<0.0002	0.0083	0.0015	<0.001	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.0002	0.0002
SS165	03 Mar 2021	0082_SS165_210303	Normal	EP2102192	<0.0002	<0.0002	<0.0002	<0.0002	0.0012	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS165	21 Jun 2021	0082_SD165_210621	Normal	EP2107034	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS165	22 Nov 2021	0082_SD165_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0002	0.0084	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	0.0014	<0.0002	<0.0002
SS165	16 May 2022	0082_SS165_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0002	0.0019	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS165	20 Jun 2022	0082_SS165_220620	Normal	EP2207561	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS165	21 Nov 2022	0082_SS165_221121	Normal	EP2215716	<0.0002	<0.0002	<0.0002	<0.0002	0.0012	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS165	26 Jun 2023	0082_SS165_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0002	0.0052	0.0003	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS167	14 Feb 2018	0082_SS167_0.0_180214	Normal	206929	<0.0001	<0.0001	<0.0001	<0.0001	0.0008	0.0005	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS167	14 Feb 2018	0082_SS167_0.4_180214	Normal	206929	<0.0001	<0.0001	<0.0001	<0.0001	0.0013	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS167	08 Jun 2018	0082_QC253_180607	Interlab Duplicate	604115	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS167	08 Jun 2018	0082_SS167_0.0_180608	Normal	211877	<0.0001	<0.0001	<0.0001	<0.0001	0.0008	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS167	08 Jun 2018	0082_SS167_0.5_180608	Normal	211877	<0.0001	<0.0001	<0.0001	<0.0001	0.0067	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	0.0001	<0.0005	<0.0005
SS167	27 Nov 2019	0082_SS167_191127	Normal	EP1912552	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS167	28 May 2020	0082_QC101_200528	Field Duplicate	EP2005659	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS167	28 May 2020	0082_QC201_200528	Interlab Duplicate	723692	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS167	28 May 2020	0082_SS167_200528	Normal	EP2005659	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS167	23 Jun 2020	0082_SS167_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0002	0.0022	0.0014	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002
SS167	16 Nov 2020	0082_SS167_201116	Normal	EP2012671	<0.0002	<0.0002	<0.0002	<0.0002	0.0024	0.0011	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS167	03 Mar 2021	0082_SD167_210303	Normal	EP2102200	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS167	21 Jun 2021	0082_SD167_210621	Normal	EP2107034	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS167	22 Nov 2021	0082_SS167_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0002	0.0027	0.0006	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS167	16 May 2022	0082_SS167_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS167	20 Jun 2022	0082_SS167_220620	Normal	EP2207561	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS167	21 Nov 2022	0082_SS167_221121	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS167	26 Jun 2023	0082_SS167_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS169	25 Feb 2018	0082_SS169_0.0_180225	Normal	207529	<0.0001	<0.0001	<0.0001	<0.0002	0.0007	0.0003	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS169	25 Feb 2018	0082_SS169_0.3_180225	Normal	207529	<0.0001	<0.0001	<0.0001	<0.0002	0.0032	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS169	27 Nov 2019	0082_SS169_191127	Normal	EP1912552	<0.0002	<0.0002	<0.0002	<0.0002	0.0010	0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

					PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids							
					Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0001	0.0001	0.0001	0.0002	0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
SS169	28 May 2020	0082_SS169_200528	Normal	EP2005659	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS169	23 Jun 2020	0082_SS169_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS169	16 Nov 2020	0082_SS169_201116	Normal	EP2012671	<0.0002	<0.0002	<0.0002	<0.0002	0.0016	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS169	03 Mar 2021	0082_SD169_210303	Normal	EP2102200	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS169	21 Jun 2021	0082_SD169_210621	Normal	EP2107034	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS169	22 Nov 2021	0082_SS169_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS169	16 May 2022	0082_SS169_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0002	0.0008	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS169	20 Jun 2022	0082_QC102_220620	Field Duplicate	EP2207561	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS169	20 Jun 2022	0082_QC202_220620	Interlab Duplicate	901186	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.0002	<0.0004	<0.0008	<0.0002	<0.0002	<0.0002	<0.0002
SS169	20 Jun 2022	0082_SS169_220620	Normal	EP2207561	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS169	21 Nov 2022	0082_SS169_221121	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0002	0.0009	0.0016	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS169	26 Jun 2023	0082_SS169_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS171	25 Feb 2018	0082_SS171_0.0_180225	Normal	207529	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS171	25 Feb 2018	0082_SS171_0.3_180225	Normal	207529	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS171	27 Nov 2019	0082_SS171_191127	Normal	EP1912550	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS171	28 May 2020	0082_SS171_200528	Normal	EP2005560	<0.0002	<0.0002	<0.0002	<0.0002	0.0016	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS171	23 Jun 2020	0082_SS171_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0002	0.0010	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS171	16 Nov 2020	0082_SS171_201116	Normal	EP2012673	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS171	03 Mar 2021	0082_SS171_210303	Normal	EP2102200	<0.0002	<0.0002	<0.0002	<0.0002	0.0026	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS171	21 Jun 2021	0082_SS171_210621	Normal	EP2107034	<0.0002	<0.0002	<0.0002	<0.0002	0.0056	0.0034	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	0.0003
SS171	22 Nov 2021	0082_SS171_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS171	16 May 2022	0082_SS171_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS171	20 Jun 2022	0082_SS171_220620	Normal	EP2207567	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS171	21 Nov 2022	0082_SS171_221121	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS171	26 Jun 2023	0082_SS171_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0002	0.0010	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS173	25 Feb 2018	0082_SS173_0.0_180225	Normal	207529	<0.0001	<0.0001	<0.0001	<0.0002	0.0007	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS173	25 Feb 2018	0082_SS173_0.3_180225	Normal	207529	<0.0001	<0.0001	<0.0001	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS173	08 Jun 2018	0082_SS173_0.0_180608	Normal	211877	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS173	27 Nov 2019	0082_SS173_191127	Normal	EP1912550	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS173	28 May 2020	0082_SS173_200528	Normal	EP2005560	<0.0002	<0.0002	<0.0002	<0.0002	0.0008	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS173	23 Jun 2020	0082_SS173_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS173	16 Nov 2020	0082_SS173_201116	Normal	EP2012673	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS173	03 Mar 2021	0082_SS173_210303	Normal	EP2102200	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS173	21 Jun 2021	0082_SS173_210621	Normal	EP2107026	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS173	22 Nov 2021	0082_SS173_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS173	16 May 2022	0082_SS173_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS173	20 Jun 2022	0082_SS173_220620	Normal	EP2207567	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS173	21 Nov 2022	0082_SS173_221121	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS173	26 Jun 2023	0082_SS173_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS179	25 Feb 2018	0082_SS179_0.0_180225	Normal	207529	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0002	<0.0002	<0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0005
SS179	27 Nov 2019	0082_QC106_191127	Field Duplicate	EP1912550	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS179	27 Nov 2019	0082_QC206_191127	Interlab Duplicate	691496	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS179	27 Nov 2019	0082_SS179_191127	Normal	EP1912550	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS179	23 Jun 2020	0082_SS179_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS179	16 Nov 2020	0082_SS179_201116	Normal	EP2012673	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS179	03 Mar 2021	0082_SS179_210303	Normal	EP2102192	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS179	21 Jun 2021	0082_SS179_210621	Normal	EP2107026	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS179	22 Nov 2021	0082_QC103_211122	Field Duplicate	EP2114223	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS179	22 Nov 2021	0082_QC203_211122	Interlab Duplicate	844500	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS179	22 Nov 2021	0082_SS179_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS179	16 May 2022	0082_SS179_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS179	20 Jun 2022	0082_SS179_220620	Normal	EP2207567	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS179	21 Nov 2022	0082_SS179_221121	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
SS179	26 Jun 2023	0082_SS179_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

First time detectionof PFOA or PFHxS+PFOS

					PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides					
					Perfluorobutane sulfonic acid (PFBS)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
SD163	2/23/2018	0082_QC1207_180223	Field Duplicate	207359	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SD163	2/23/2018	0082_QC2207_180223	Interlab Duplicate	587299	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SD163	2/23/2018	0082_SS163_0.0_180223	Normal	207359	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SD163	2/23/2018	0082_SS163_0.4_180223	Normal	207359	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SD163	6/23/2018	0082_SS163_0.0_180623	Normal	212780	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SD163	6/23/2018	0082_SS163_0.4_180623	Normal	212780	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SD163	5/26/2020	0082_SD163_200526	Normal	EP2005402	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD163	6/23/2020	0082_SD163_0.00-0.10_200623	Normal	EP2006517	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD163	11/16/2020	0082_QC101_201116	Field Duplicate	EP2012674	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD163	11/16/2020	0082_QC201_201116	Interlab Duplicate	758013	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SD163	11/16/2020	0082_SD163_201116	Normal	EP2012674	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD163	3/3/2021	0082_SD163_210303	Normal	EP2102200	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD163	6/21/2021	0082_QC102_210621	Field Duplicate	EP2107026	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD163	6/21/2021	0082_QC202_210621	Interlab Duplicate	805490	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SD163	6/21/2021	0082_SD163_210621	Normal	EP2107026	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD163	11/22/2021	0082_QC102_211122	Field Duplicate	EP2114223	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD163	11/22/2021	0082_QC202_211122	Interlab Duplicate	844500	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SD163	11/22/2021	0082_SD163_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD163	5/16/2022	0082_SD163_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD163	6/20/2022	0082_SD163_220620	Normal	EP2207569	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD163	11/20/2022	0082_SD163_221120	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD163	6/26/2023	0082_SD163_230626	Normal	EP2308609	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD181	28 Nov 2019	0082_SD181_0.00-0.10_191128	Normal	EP1912601	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD181	26 May 2020	0082_SD181_200526	Normal	EP2005402	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD181	23 Jun 2020	0082_SD181_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD181	16 Nov 2020	0082_SD181_201116	Normal	EP2012673	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD181	03 Mar 2021	0082_SD181_210303	Normal	EP2102192	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD181	21 Jun 2021	0082_SD181_210621	Normal	EP2107026	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD181	22 Nov 2021	0082_SD181_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD181	16 May 2022	0082_QC102_220516	Field Duplicate	EP2205861	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD181	16 May 2022	0082_QC202_220516	Interlab Duplicate	890769	<0.0004	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004
SD181	16 May 2022	0082_SD181_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD181	20 Jun 2022	0082_SD181_220620	Normal	EP2207567	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD181	20 Nov 2022	0082_SD181_221120	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SD181	26 Jun 2023	0082_SD181_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS161	2/25/2018	0082_QC208_180225	Interlab Duplicate	588073	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SS161	2/25/2018	0082_QC1208_180225	Field Duplicate	207529	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS161	2/25/2018	0082_QC2208_180225	Interlab Duplicate	588710	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SS161	2/25/2018	0082_SS161_0.0_180225	Normal	207529	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS161	2/25/2018	0082_SS161_0.4_180225	Normal	207529	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS161	6/23/2018	0082_SS161_0.0_180623	Normal	212780	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS161	6/23/2018	0082_SS161_0.4_180623	Normal	212780	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS161	11/27/2019	0082_SS161_191127	Normal	EP1912545	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS161	5/26/2020	0082_SD161_200526	Normal	EP2005402	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS161	6/23/2020	0082_SD161_0.00-0.10_200623	Normal	EP2006517	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS161	11/16/2020	0082_SD161_0.00-0.10_201116	Normal	EP2012674	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS161	3/3/2021	0082_SD161_210303	Normal	EP2102200	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS161	6/21/2021	0082_SD161_210621	Normal	EP2107026	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS161	11/22/2021	0082_SD161_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS161	5/16/2022	0082_SD161_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS161	6/20/2022	0082_QC107_220620	Field Duplicate	EP2207567	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS161	6/20/2022	0082_QC207_220620	Interlab Duplicate	901186	<0.0004	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004
SS161	6/20/2022	0082_SD161_220620	Normal	EP2207567	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS161	11/20/2022	0082_SD161_221120	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS161	6/26/2023	0082_SD161_230626	Normal	EP2308609	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS162	2/25/2018	0082_SS162_0.0_180225	Normal	207529	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS162	2/25/2018	0082_SS162_0.5_180225	Normal	207529	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS162	6/23/2018	0082_SS162_0.0_180623	Normal	212780	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS162	6/23/2018	0082_SS162_0.4_180623	Normal	212780	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS162	11/27/2019	0082_SS162_191127	Normal	EP1912545	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS162	5/26/2020	0082_SD162_200526	Normal	EP2005402	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS162	6/23/2020	0082_QC101_0.00-0.10_200623	Field Duplicate	EP2006517	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS162	6/23/2020	0082_-SD162_0.00-0.10_200623	Normal	EP2006517	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS162	11/16/2020	0082_SD162_201116	Normal	EP2012674	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS162	3/3/2021	0082_SD162_210303	Normal	EP2102200	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS162	6/21/2021	0082_SD162_210621	Normal	EP2107026	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS162	11/22/2021	0082_SD162_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002

					PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides					
					Perfluorobutane sulfonic acid (PFBS)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
SS162	5/16/2022	0082_SD162_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS162	6/20/2022	0082_SD162_220620	Normal	EP2207567	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS162	11/20/2022	0082_QC101_221120	Field Duplicate	EP2215642	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS162	11/20/2022	0082_QC201_221120	Interlab Duplicate	945158	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS162	11/20/2022	0082_SD162_221120	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS162	6/26/2023	0082_QC106_230626	Field Duplicate	EP2308609	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS162	6/26/2023	0082_QC206_230626	Interlab Duplicate	1004374	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SS162	6/26/2023	0082_SD162_230626	Normal	EP2308609	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	14 Feb 2018	0082_SS164_0.0_180214	Normal	206929	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	0.0002	0.0009	0.0005	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS164	14 Feb 2018	0082_SS164_0.4_180214	Normal	206929	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	0.0011	0.0024	0.0007	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS164	08 Jun 2018	0082_SS164_0.0_180608	Normal	211877	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	0.0003	0.0005	0.0002	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS164	08 Jun 2018	0082_SS164_0.5_180608	Normal	211877	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	0.0004	0.0004	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS164	27 Nov 2019	0082_SS164_191127	Normal	EP1912552	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	25 May 2020	0082_SD164_200525	Normal	EP2005401	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	23 Jun 2020	0082_SD164_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	16 Nov 2020	0082_SD164_201116	Normal	EP2012671	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	0.0026	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	03 Mar 2021	0082_QC102_210303	Field Duplicate	EP2102200	<0.0002	0.0002	0.0002	<0.0005	<0.0005	0.0006	0.0012	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	03 Mar 2021	0082_QC202_210303	Interlab Duplicate	779272	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SS164	03 Mar 2021	0082_SD164_210303	Normal	EP2102200	<0.0002	0.0004	0.0002	<0.0005	<0.0005	0.0010	0.0015	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	21 Jun 2021	0082_QC105_210621	Field Duplicate	EP2107034	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	21 Jun 2021	0082_QC205_210621	Interlab Duplicate	805490	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SS164	21 Jun 2021	0082_SD164_210621	Normal	EP2107034	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	22 Nov 2021	0082_SD164_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	16 May 2022	0082_QC100_220516	Field Duplicate	EP2205861	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	0.0012	0.0014	0.0008	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	16 May 2022	0082_QC200_220516	Interlab Duplicate	890769	<0.0004	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	0.0019	0.0018	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004
SS164	16 May 2022	0082_SD164_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	0.0016	0.0009	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	20 Jun 2022	0082_SD164_220620	Normal	EP2207561	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	21 Nov 2022	0082_QC108_221121	Field Duplicate	EP2215716	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	21 Nov 2022	0082_QC208_221120	Interlab Duplicate	945158	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SS164	21 Nov 2022	0082_SD164_221121	Normal	EP2215716	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	26 Jun 2023	0082_QC105_230626	Field Duplicate	EP2308619	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS164	26 Jun 2023	0082_QC205_230626	Interlab Duplicate	1004374	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SS164	26 Jun 2023	0082_SS164_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS165	14 Feb 2018	0082_SS165_0.0_180214	Normal	206929	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS165	14 Feb 2018	0082_SS165_0.4_180214	Normal	206929	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	0.0004	0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS165	27 Nov 2019	0082_SS165_191127	Normal	EP1912550	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS165	28 May 2020	0082_SS165_200528	Normal	EP2005659	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	0.0008	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS165	23 Jun 2020	0082_SS165_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS165	16 Nov 2020	0082_SS165_201116	Normal	EP2012671	<0.0002	0.0002	<0.0002	<0.0005	<0.0005	<0.0005	0.0007	<0.0005	0.0002	<0.0005	0.0005	<0.0005	<0.0005	0.0004
SS165	03 Mar 2021	0082_SS165_210303	Normal	EP2102192	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS165	21 Jun 2021	0082_SD165_210621	Normal	EP2107034	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS165	22 Nov 2021	0082_SD165_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS165	16 May 2022	0082_SS165_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS165	20 Jun 2022	0082_SS165_220620	Normal	EP2207561	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS165	21 Nov 2022	0082_SS165_221121	Normal	EP2215716	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS165	26 Jun 2023	0082_SS165_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS167	14 Feb 2018	0082_SS167_0.0_180214	Normal	206929	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS167	14 Feb 2018	0082_SS167_0.4_180214	Normal	206929	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS167	08 Jun 2018	0082_QC253_180607	Interlab Duplicate	604115	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SS167	08 Jun 2018	0082_SS167_0.0_180608	Normal	211877	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS167	08 Jun 2018	0082_SS167_0.5_180608	Normal	211877	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS167	27 Nov 2019	0082_SS167_191127	Normal	EP1912552	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS167	28 May 2020	0082_QC101_200528	Field Duplicate	EP2005659	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS167	28 May 2020	0082_QC201_200528	Interlab Duplicate	723692	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SS167	28 May 2020	0082_SS167_200528	Normal	EP2005659	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS167	23 Jun 2020	0082_SS167_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS167	16 Nov 2020	0082_SS167_201116	Normal	EP2012671	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS167	03 Mar 2021	0082_SD167_210303	Normal	EP2102200	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS167	21 Jun 2021	0082_SD167_210621	Normal	EP2107034	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS167	22 Nov 2021	0082_SS167_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS167	16 May 2022	0082_SS167_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS167	20 Jun 2022	0082_SS167_220620	Normal	EP2207561	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS167	21 Nov 2022	0082_SS167_221121	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS167	26 Jun 2023	0082_SS167_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS169	25 Feb 2018	0082_SS169_0.0_180225	Normal	207529	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS169	25 Feb 2018	0082_SS169_0.3_180225	Normal	207529	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS169	27 Nov 2019	0082_SS169_191127	Normal	EP1912552	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002

					PFAS - (n:2) Fluorotelomer Sulfonic Acids				PFAS - Perfluoroalkyl Sulfonamides					
					Perfluorobutane sulfonic acid (PFBS)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-methyl perfluorooctane sulfonamidoethanol (MeFOSE)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0001	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0002	0.0004	0.0002	0.0005	0.0004	0.0002
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**														
SS169	28 May 2020	0082_SS169_200528	Normal	EP2005659	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS169	23 Jun 2020	0082_SS169_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS169	16 Nov 2020	0082_SS169_201116	Normal	EP2012671	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS169	03 Mar 2021	0082_SD169_210303	Normal	EP2102200	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS169	21 Jun 2021	0082_SD169_210621	Normal	EP2107034	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS169	22 Nov 2021	0082_SS169_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS169	16 May 2022	0082_SS169_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS169	20 Jun 2022	0082_QC102_220620	Field Duplicate	EP2207561	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS169	20 Jun 2022	0082_QC202_220620	Interlab Duplicate	901186	<0.0004	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0004	<0.0004	<0.0004	<0.0008	<0.0004	<0.0004
SS169	20 Jun 2022	0082_SS169_220620	Normal	EP2207561	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS169	21 Nov 2022	0082_SS169_221121	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS169	26 Jun 2023	0082_SS169_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS171	25 Feb 2018	0082_SS171_0.0_180225	Normal	207529	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS171	25 Feb 2018	0082_SS171_0.3_180225	Normal	207529	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS171	27 Nov 2019	0082_SS171_191127	Normal	EP1912550	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS171	28 May 2020	0082_SS171_200528	Normal	EP2005560	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS171	23 Jun 2020	0082_SS171_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS171	16 Nov 2020	0082_SS171_201116	Normal	EP2012673	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS171	03 Mar 2021	0082_SS171_210303	Normal	EP2102200	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS171	21 Jun 2021	0082_SS171_210621	Normal	EP2107034	<0.0002	<0.0002	0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS171	22 Nov 2021	0082_SS171_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS171	16 May 2022	0082_SS171_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS171	20 Jun 2022	0082_SS171_220620	Normal	EP2207567	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS171	21 Nov 2022	0082_SS171_221121	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS171	26 Jun 2023	0082_SS171_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS173	25 Feb 2018	0082_SS173_0.0_180225	Normal	207529	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS173	25 Feb 2018	0082_SS173_0.3_180225	Normal	207529	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS173	08 Jun 2018	0082_SS173_0.0_180608	Normal	211877	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS173	27 Nov 2019	0082_SS173_191127	Normal	EP1912550	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS173	28 May 2020	0082_SS173_200528	Normal	EP2005560	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS173	23 Jun 2020	0082_SS173_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS173	16 Nov 2020	0082_SS173_201116	Normal	EP2012673	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS173	03 Mar 2021	0082_SS173_210303	Normal	EP2102200	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS173	21 Jun 2021	0082_SS173_210621	Normal	EP2107026	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS173	22 Nov 2021	0082_SS173_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS173	16 May 2022	0082_SS173_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS173	20 Jun 2022	0082_SS173_220620	Normal	EP2207567	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS173	21 Nov 2022	0082_SS173_221121	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS173	26 Jun 2023	0082_SS173_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS179	25 Feb 2018	0082_SS179_0.0_180225	Normal	207529	<0.0001	<0.0005	<0.0005	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.001	<0.0002	<0.001	<0.001	<0.0002
SS179	27 Nov 2019	0082_QC106_191127	Field Duplicate	EP1912550	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS179	27 Nov 2019	0082_QC206_191127	Interlab Duplicate	691496	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SS179	27 Nov 2019	0082_SS179_191127	Normal	EP1912550	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS179	23 Jun 2020	0082_SS179_200623	Normal	EP2006522	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS179	16 Nov 2020	0082_SS179_201116	Normal	EP2012673	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS179	03 Mar 2021	0082_SS179_210303	Normal	EP2102192	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS179	21 Jun 2021	0082_SS179_210621	Normal	EP2107026	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS179	22 Nov 2021	0082_QC103_211122	Field Duplicate	EP2114223	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS179	22 Nov 2021	0082_QC203_211122	Interlab Duplicate	844500	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01
SS179	22 Nov 2021	0082_SS179_211122	Normal	EP2114223	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS179	16 May 2022	0082_SS179_220516	Normal	EP2205861	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS179	20 Jun 2022	0082_SS179_220620	Normal	EP2207567	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS179	21 Nov 2022	0082_SS179_221121	Normal	EP2215642	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002
SS179	26 Jun 2023	0082_SS179_230626	Normal	EP2308619	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002

First time detectionof PFOA or PFHxS+PFOS

							PFAS		
					Perfluorobutane sulfonic acid (PFBS)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0001	0.0005	0.0002	0.0002	0.0002
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**					
SD163	2/23/2018	0082_QC1207_180223	Field Duplicate	207359	<0.0001	<0.005			
SD163	2/23/2018	0082_QC2207_180223	Interlab Duplicate	587299	<0.005	<0.005	<0.005	<0.01	<0.05
SD163	2/23/2018	0082_SS163_0.0_180223	Normal	207359	<0.0001	<0.005			
SD163	2/23/2018	0082_SS163_0.4_180223	Normal	207359	<0.0001	<0.005			
SD163	6/23/2018	0082_SS163_0.0_180623	Normal	212780	<0.0001	<0.005	<0.0001		<0.0001
SD163	6/23/2018	0082_SS163_0.4_180623	Normal	212780	<0.0001	<0.005	<0.0001		<0.0001
SD163	5/26/2020	0082_SD163_200526	Normal	EP2005402	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD163	6/23/2020	0082_SD163_0.00-0.10_200623	Normal	EP2006517	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD163	11/16/2020	0082_QC101_201116	Field Duplicate	EP2012674	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD163	11/16/2020	0082_QC201_201116	Interlab Duplicate	758013	<0.005	<0.005	<0.005	<0.01	<0.05
SD163	11/16/2020	0082_SD163_201116	Normal	EP2012674	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD163	3/3/2021	0082_SD163_210303	Normal	EP2102200	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD163	6/21/2021	0082_QC102_210621	Field Duplicate	EP2107026	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD163	6/21/2021	0082_QC202_210621	Interlab Duplicate	805490	<0.005	<0.005	<0.005	<0.01	<0.05
SD163	6/21/2021	0082_SD163_210621	Normal	EP2107026	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD163	11/22/2021	0082_QC102_211122	Field Duplicate	EP2114223	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD163	11/22/2021	0082_QC202_211122	Interlab Duplicate	844500	<0.005	<0.005	<0.005	<0.01	<0.05
SD163	11/22/2021	0082_SD163_211122	Normal	EP2114223	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD163	5/16/2022	0082_SD163_220516	Normal	EP2205861	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD163	6/20/2022	0082_SD163_220620	Normal	EP2207569	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD163	11/20/2022	0082_SD163_221120	Normal	EP2215642	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD163	6/26/2023	0082_SD163_230626	Normal	EP2308609	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD181	28 Nov 2019	0082_SD181_0.00-0.10_191128	Normal	EP1912601	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD181	26 May 2020	0082_SD181_200526	Normal	EP2005402	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD181	23 Jun 2020	0082_SD181_200623	Normal	EP2006522	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD181	16 Nov 2020	0082_SD181_201116	Normal	EP2012673	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD181	03 Mar 2021	0082_SD181_210303	Normal	EP2102192	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD181	21 Jun 2021	0082_SD181_210621	Normal	EP2107026	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD181	22 Nov 2021	0082_SD181_211122	Normal	EP2114223	<0.0002	<0.0005	0.0006	0.0006	0.0006
SD181	16 May 2022	0082_QC102_220516	Field Duplicate	EP2205861	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD181	16 May 2022	0082_QC202_220516	Interlab Duplicate	890769	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
SD181	16 May 2022	0082_SD181_220516	Normal	EP2205861	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD181	20 Jun 2022	0082_SD181_220620	Normal	EP2207567	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD181	20 Nov 2022	0082_SD181_221120	Normal	EP2215642	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SD181	26 Jun 2023	0082_SD181_230626	Normal	EP2308619	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS161	2/25/2018	0082_QC208_180225	Interlab Duplicate	588073	<0.005	<0.005	<0.005	<0.01	<0.05
SS161	2/25/2018	0082_QC1208_180225	Field Duplicate	207529	<0.0001	<0.005			
SS161	2/25/2018	0082_QC2208_180225	Interlab Duplicate	588710	<0.005	<0.005	<0.005	<0.01	<0.05
SS161	2/25/2018	0082_SS161_0.0_180225	Normal	207529	<0.0001	<0.005			
SS161	2/25/2018	0082_SS161_0.4_180225	Normal	207529	<0.0001	<0.005			
SS161	6/23/2018	0082_SS161_0.0_180623	Normal	212780	<0.0001	<0.005	<0.0001		<0.0001
SS161	6/23/2018	0082_SS161_0.4_180623	Normal	212780	<0.0001	<0.005	<0.0001		<0.0001
SS161	11/27/2019	0082_SS161_191127	Normal	EP1912545	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS161	5/26/2020	0082_SD161_200526	Normal	EP2005402	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS161	6/23/2020	0082_SD161_0.00-0.10_200623	Normal	EP2006517	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS161	11/16/2020	0082_SD161_0.00-0.10_201116	Normal	EP2012674	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS161	3/3/2021	0082_SD161_210303	Normal	EP2102200	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS161	6/21/2021	0082_SD161_210621	Normal	EP2107026	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS161	11/22/2021	0082_SD161_211122	Normal	EP2114223	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS161	5/16/2022	0082_SD161_220516	Normal	EP2205861	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS161	6/20/2022	0082_QC107_220620	Field Duplicate	EP2207567	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS161	6/20/2022	0082_QC207_220620	Interlab Duplicate	901186	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
SS161	6/20/2022	0082_SD161_220620	Normal	EP2207567	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS161	11/20/2022	0082_SD161_221120	Normal	EP2215642	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS161	6/26/2023	0082_SD161_230626	Normal	EP2308609	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	2/25/2018	0082_SS162_0.0_180225	Normal	207529	<0.0001	<0.005			
SS162	2/25/2018	0082_SS162_0.5_180225	Normal	207529	<0.0001	<0.005			
SS162	6/23/2018	0082_SS162_0.0_180623	Normal	212780	<0.0001	<0.005	<0.0001		<0.0001
SS162	6/23/2018	0082_SS162_0.4_180623	Normal	212780	<0.0001	<0.005	<0.0001		<0.0001
SS162	11/27/2019	0082_SS162_191127	Normal	EP1912545	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	5/26/2020	0082_SD162_200526	Normal	EP2005402	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	6/23/2020	0082_QC101_0.00-0.10_200623	Field Duplicate	EP2006517	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	6/23/2020	0082_-SD162_0.00-0.10_200623	Normal	EP2006517	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	11/16/2020	0082_SD162_201116	Normal	EP2012674	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	3/3/2021	0082_SD162_210303	Normal	EP2102200	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	6/21/2021	0082_SD162_210621	Normal	EP2107026	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	11/22/2021	0082_SD162_211122	Normal	EP2114223	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

							PFAS		
					Perfluorobutane sulfonic acid (PFBS)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0001	0.0005	0.0002	0.0002	0.0002
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**					
SS162	5/16/2022	0082_SD162_220516	Normal	EP2205861	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	6/20/2022	0082_SD162_220620	Normal	EP2207567	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	11/20/2022	0082_QC101_221120	Field Duplicate	EP2215642	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	11/20/2022	0082_QC201_221120	Interlab Duplicate	945158	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	11/20/2022	0082_SD162_221120	Normal	EP2215642	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	6/26/2023	0082_QC106_230626	Field Duplicate	EP2308609	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS162	6/26/2023	0082_QC206_230626	Interlab Duplicate	1004374	<0.005	<0.005	<0.005	<0.01	<0.05
SS162	6/26/2023	0082_SD162_230626	Normal	EP2308609	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS164	14 Feb 2018	0082_SS164_0.0_180214	Normal	206929	<0.0001	<0.005			
SS164	14 Feb 2018	0082_SS164_0.4_180214	Normal	206929	<0.0001	<0.005			
SS164	08 Jun 2018	0082_SS164_0.0_180608	Normal	211877	<0.0001	<0.005			
SS164	08 Jun 2018	0082_SS164_0.5_180608	Normal	211877	<0.0001	<0.005			
SS164	27 Nov 2019	0082_SS164_191127	Normal	EP1912552	<0.0002	<0.0005	0.0028	0.0028	0.0028
SS164	25 May 2020	0082_SD164_200525	Normal	EP2005401	<0.0002	<0.0005	0.0046	0.0046	0.0046
SS164	23 Jun 2020	0082_SD164_200623	Normal	EP2006522	<0.0002	<0.0005	0.0010	0.0010	0.0010
SS164	16 Nov 2020	0082_SD164_201116	Normal	EP2012671	<0.0002	<0.0005	0.0347	0.0395	0.0399
SS164	03 Mar 2021	0082_QC102_210303	Field Duplicate	EP2102200	<0.0002	<0.0005	0.0065	0.0083	0.0090
SS164	03 Mar 2021	0082_QC202_210303	Interlab Duplicate	779272	<0.005	<0.005	<0.005	<0.01	<0.05
SS164	03 Mar 2021	0082_SD164_210303	Normal	EP2102200	<0.0002	<0.0005	0.0106	0.0131	0.0140
SS164	21 Jun 2021	0082_QC105_210621	Field Duplicate	EP2107034	<0.0002	<0.0005	0.0047	0.0047	0.0051
SS164	21 Jun 2021	0082_QC205_210621	Interlab Duplicate	805490	<0.005	<0.005	<0.005	<0.01	<0.05
SS164	21 Jun 2021	0082_SD164_210621	Normal	EP2107034	<0.0002	<0.0005	0.0034	0.0034	0.0037
SS164	22 Nov 2021	0082_SD164_211122	Normal	EP2114223	<0.0002	<0.0005	0.0031	0.0031	0.0042
SS164	16 May 2022	0082_QC100_220516	Field Duplicate	EP2205861	<0.0002	<0.0005	0.0016	0.0042	0.0050
SS164	16 May 2022	0082_QC200_220516	Interlab Duplicate	890769	<0.0004	<0.0008	0.0006	0.0030	0.0047
SS164	16 May 2022	0082_SD164_220516	Normal	EP2205861	<0.0002	<0.0005	0.0013	0.0029	0.0038
SS164	20 Jun 2022	0082_SD164_220620	Normal	EP2207561	<0.0002	<0.0005	0.0003	0.0003	0.0003
SS164	21 Nov 2022	0082_QC108_221121	Field Duplicate	EP2215716	<0.0002	<0.0005	0.0003	0.0003	0.0003
SS164	21 Nov 2022	0082_QC208_221120	Interlab Duplicate	945158	<0.005	<0.005	<0.005	<0.01	<0.05
SS164	21 Nov 2022	0082_SD164_221121	Normal	EP2215716	<0.0002	<0.0005	0.0009	0.0009	0.0009
SS164	26 Jun 2023	0082_QC105_230626	Field Duplicate	EP2308619	<0.0002	<0.0005	0.0004	0.0004	0.0004
SS164	26 Jun 2023	0082_QC205_230626	Interlab Duplicate	1004374	<0.005	<0.005	<0.005	<0.01	<0.05
SS164	26 Jun 2023	0082_SS164_230626	Normal	EP2308619	<0.0002	<0.0005	0.0005	0.0005	0.0005
SS165	14 Feb 2018	0082_SS165_0.0_180214	Normal	206929	<0.0001	<0.005			
SS165	14 Feb 2018	0082_SS165_0.4_180214	Normal	206929	<0.0001	<0.005			
SS165	27 Nov 2019	0082_SS165_191127	Normal	EP1912550	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS165	28 May 2020	0082_SS165_200528	Normal	EP2005659	<0.0002	<0.0005	0.0028	0.0039	0.0047
SS165	23 Jun 2020	0082_SS165_200623	Normal	EP2006522	<0.0002	<0.0005	0.0058	0.0058	0.0058
SS165	16 Nov 2020	0082_SS165_201116	Normal	EP2012671	<0.0002	<0.0005	0.0091	0.0103	0.0133
SS165	03 Mar 2021	0082_SS165_210303	Normal	EP2102192	<0.0002	<0.0005	0.0012	0.0012	0.0012
SS165	21 Jun 2021	0082_SD165_210621	Normal	EP2107034	<0.0002	<0.0005	0.0005	0.0005	0.0005
SS165	22 Nov 2021	0082_SD165_211122	Normal	EP2114223	<0.0002	<0.0005	0.0084	0.0084	0.0098
SS165	16 May 2022	0082_SS165_220516	Normal	EP2205861	<0.0002	<0.0005	0.0019	0.0019	0.0019
SS165	20 Jun 2022	0082_SS165_220620	Normal	EP2207561	<0.0002	<0.0005	0.0006	0.0006	0.0006
SS165	21 Nov 2022	0082_SS165_221121	Normal	EP2215716	<0.0002	<0.0005	0.0012	0.0012	0.0012
SS165	26 Jun 2023	0082_SS165_230626	Normal	EP2308619	<0.0002	<0.0005	0.0052	0.0052	0.0055
SS167	14 Feb 2018	0082_SS167_0.0_180214	Normal	206929	<0.0001	<0.005			
SS167	14 Feb 2018	0082_SS167_0.4_180214	Normal	206929	<0.0001	<0.005			
SS167	08 Jun 2018	0082_QC253_180607	Interlab Duplicate	604115	<0.005	<0.005	<0.005	<0.01	<0.05
SS167	08 Jun 2018	0082_SS167_0.0_180608	Normal	211877	<0.0001	<0.005			
SS167	08 Jun 2018	0082_SS167_0.5_180608	Normal	211877	<0.0001	<0.005			
SS167	27 Nov 2019	0082_SS167_191127	Normal	EP1912552	<0.0002	<0.0005	0.0005	0.0005	0.0005
SS167	28 May 2020	0082_QC101_200528	Field Duplicate	EP2005659	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS167	28 May 2020	0082_QC201_200528	Interlab Duplicate	723692	<0.005	<0.005	<0.005	<0.01	<0.05
SS167	28 May 2020	0082_SS167_200528	Normal	EP2005659	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS167	23 Jun 2020	0082_SS167_200623	Normal	EP2006522	<0.0002	<0.0005	0.0022	0.0022	0.0038
SS167	16 Nov 2020	0082_SS167_201116	Normal	EP2012671	<0.0002	<0.0005	0.0024	0.0024	0.0035
SS167	03 Mar 2021	0082_SD167_210303	Normal	EP2102200	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS167	21 Jun 2021	0082_SD167_210621	Normal	EP2107034	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS167	22 Nov 2021	0082_SS167_211122	Normal	EP2114223	<0.0002	<0.0005	0.0027	0.0027	0.0033
SS167	16 May 2022	0082_SS167_220516	Normal	EP2205861	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS167	20 Jun 2022	0082_SS167_220620	Normal	EP2207561	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS167	21 Nov 2022	0082_SS167_221121	Normal	EP2215642	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS167	26 Jun 2023	0082_SS167_230626	Normal	EP2308619	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS169	25 Feb 2018	0082_SS169_0.0_180225	Normal	207529	<0.0001	<0.005			
SS169	25 Feb 2018	0082_SS169_0.3_180225	Normal	207529	<0.0001	<0.005			
SS169	27 Nov 2019	0082_SS169_191127	Normal	EP1912552	<0.0002	<0.0005	0.0010	0.0010	0.0012

							PFAS		
					Perfluorobutane sulfonic acid (PFBS)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	Sum of PFHxS and PFOS	Sum of PFAS (WA DER List)	Sum of PFAS
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
LOR - Limit of Reporting					0.0001	0.0005	0.0002	0.0002	0.0002
Location Code	**Date**	**Field ID**	**Sample Type**	**Lab Report Number**					
SS169	28 May 2020	0082_SS169_200528	Normal	EP2005659	<0.0002	<0.0005	0.0006	0.0006	0.0006
SS169	23 Jun 2020	0082_SS169_200623	Normal	EP2006522	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS169	16 Nov 2020	0082_SS169_201116	Normal	EP2012671	<0.0002	<0.0005	0.0016	0.0016	0.0016
SS169	03 Mar 2021	0082_SD169_210303	Normal	EP2102200	<0.0002	<0.0005	0.0004	0.0004	0.0004
SS169	21 Jun 2021	0082_SD169_210621	Normal	EP2107034	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS169	22 Nov 2021	0082_SS169_211122	Normal	EP2114223	<0.0002	<0.0005	0.0004	0.0004	0.0004
SS169	16 May 2022	0082_SS169_220516	Normal	EP2205861	<0.0002	<0.0005	0.0008	0.0008	0.0008
SS169	20 Jun 2022	0082_QC102_220620	Field Duplicate	EP2207561	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS169	20 Jun 2022	0082_QC202_220620	Interlab Duplicate	901186	<0.0004	<0.0008	<0.0004	<0.0002	<0.0002
SS169	20 Jun 2022	0082_SS169_220620	Normal	EP2207561	<0.0002	<0.0005	0.0004	0.0004	0.0004
SS169	21 Nov 2022	0082_SS169_221121	Normal	EP2215642	<0.0002	<0.0005	0.0009	0.0009	0.0025
SS169	26 Jun 2023	0082_SS169_230626	Normal	EP2308619	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS171	25 Feb 2018	0082_SS171_0.0_180225	Normal	207529	<0.0001	<0.005			
SS171	25 Feb 2018	0082_SS171_0.3_180225	Normal	207529	<0.0001	<0.005			
SS171	27 Nov 2019	0082_SS171_191127	Normal	EP1912550	<0.0002	<0.0005	0.0004	0.0004	0.0004
SS171	28 May 2020	0082_SS171_200528	Normal	EP2005560	<0.0002	<0.0005	0.0016	0.0016	0.0016
SS171	23 Jun 2020	0082_SS171_200623	Normal	EP2006522	<0.0002	<0.0005	0.0010	0.0010	0.0010
SS171	16 Nov 2020	0082_SS171_201116	Normal	EP2012673	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS171	03 Mar 2021	0082_SS171_210303	Normal	EP2102200	<0.0002	<0.0005	0.0026	0.0026	0.0026
SS171	21 Jun 2021	0082_SS171_210621	Normal	EP2107034	<0.0002	<0.0005	0.0056	0.0056	0.0098
SS171	22 Nov 2021	0082_SS171_211122	Normal	EP2114223	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS171	16 May 2022	0082_SS171_220516	Normal	EP2205861	<0.0002	<0.0005	0.0004	0.0004	0.0004
SS171	20 Jun 2022	0082_SS171_220620	Normal	EP2207567	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS171	21 Nov 2022	0082_SS171_221121	Normal	EP2215642	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS171	26 Jun 2023	0082_SS171_230626	Normal	EP2308619	<0.0002	<0.0005	0.0010	0.0010	0.0010
SS173	25 Feb 2018	0082_SS173_0.0_180225	Normal	207529	<0.0001	<0.005			
SS173	25 Feb 2018	0082_SS173_0.3_180225	Normal	207529	<0.0001	<0.005			
SS173	08 Jun 2018	0082_SS173_0.0_180608	Normal	211877	<0.0001	<0.005			
SS173	27 Nov 2019	0082_SS173_191127	Normal	EP1912550	<0.0002	<0.0005	0.0003	0.0003	0.0003
SS173	28 May 2020	0082_SS173_200528	Normal	EP2005560	<0.0002	<0.0005	0.0008	0.0008	0.0008
SS173	23 Jun 2020	0082_SS173_200623	Normal	EP2006522	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS173	16 Nov 2020	0082_SS173_201116	Normal	EP2012673	<0.0002	<0.0005	0.0002	0.0002	0.0002
SS173	03 Mar 2021	0082_SS173_210303	Normal	EP2102200	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS173	21 Jun 2021	0082_SS173_210621	Normal	EP2107026	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS173	22 Nov 2021	0082_SS173_211122	Normal	EP2114223	<0.0002	<0.0005	0.0002	0.0002	0.0002
SS173	16 May 2022	0082_SS173_220516	Normal	EP2205861	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS173	20 Jun 2022	0082_SS173_220620	Normal	EP2207567	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS173	21 Nov 2022	0082_SS173_221121	Normal	EP2215642	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS173	26 Jun 2023	0082_SS173_230626	Normal	EP2308619	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS179	25 Feb 2018	0082_SS179_0.0_180225	Normal	207529	<0.0001	<0.005			
SS179	27 Nov 2019	0082_QC106_191127	Field Duplicate	EP1912550	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS179	27 Nov 2019	0082_QC206_191127	Interlab Duplicate	691496	<0.005	<0.005	<0.005	<0.01	<0.05
SS179	27 Nov 2019	0082_SS179_191127	Normal	EP1912550	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS179	23 Jun 2020	0082_SS179_200623	Normal	EP2006522	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS179	16 Nov 2020	0082_SS179_201116	Normal	EP2012673	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS179	03 Mar 2021	0082_SS179_210303	Normal	EP2102192	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS179	21 Jun 2021	0082_SS179_210621	Normal	EP2107026	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS179	22 Nov 2021	0082_QC103_211122	Field Duplicate	EP2114223	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS179	22 Nov 2021	0082_QC203_211122	Interlab Duplicate	844500	<0.005	<0.005	<0.005	<0.01	<0.05
SS179	22 Nov 2021	0082_SS179_211122	Normal	EP2114223	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS179	16 May 2022	0082_SS179_220516	Normal	EP2205861	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS179	20 Jun 2022	0082_SS179_220620	Normal	EP2207567	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS179	21 Nov 2022	0082_SS179_221121	Normal	EP2215642	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002
SS179	26 Jun 2023	0082_SS179_230626	Normal	EP2308619	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002

First time detectionof PFOA or PFHxS+PFOS

Trend Report

Report Date & Time: 2024-03-27 00:21:13

Data File Name: 0082_MKA_input 02.csv

Report Title: Groundwater Trend

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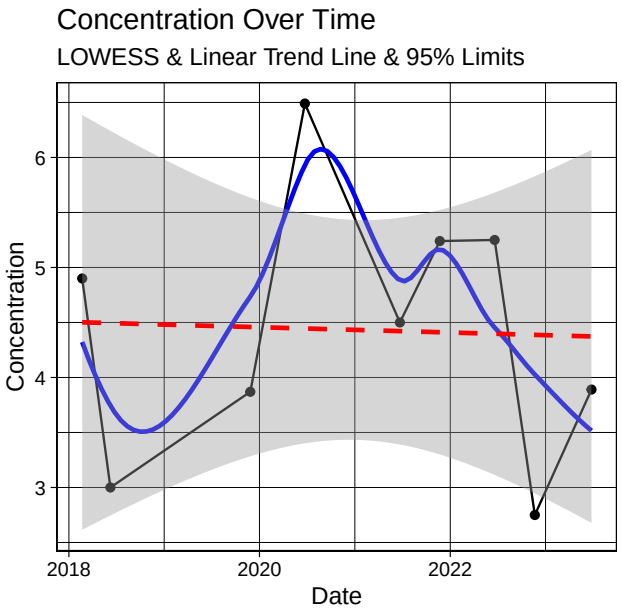
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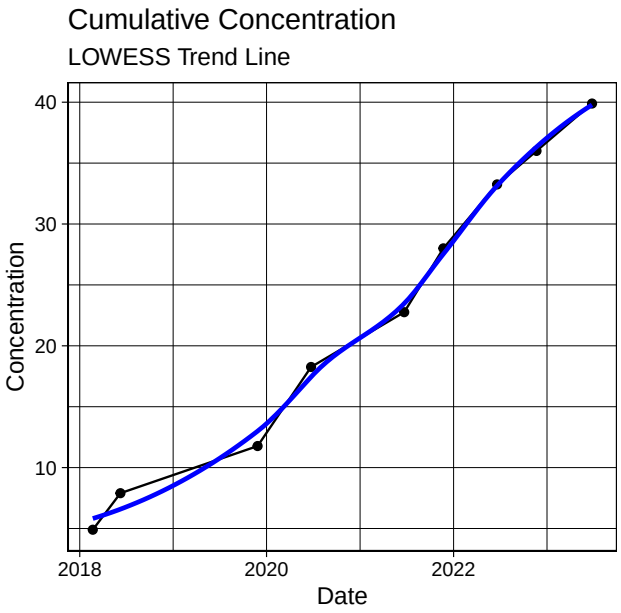
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Kendall Trend Test Results Continuous	
n	9
z	0
p	1
S	0
varS	92
tau	0
mean	4.43
sd	1.19
cov	0.27
results	STABLE

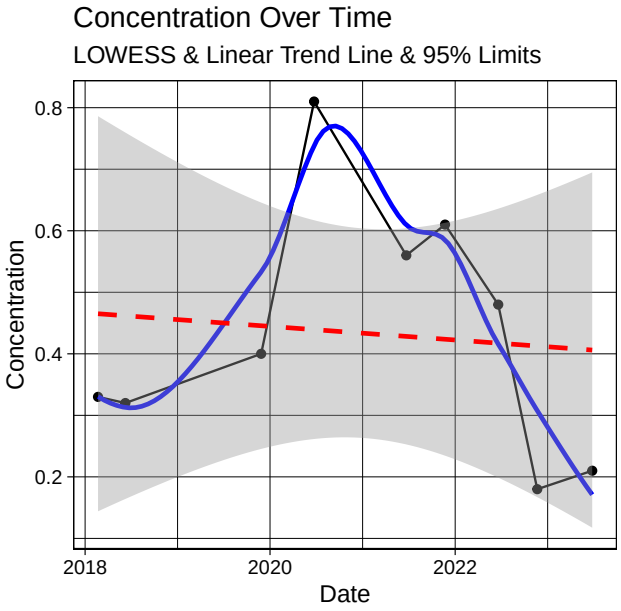
Report for ID : MW022 and Analyte : PFHxS+PFOS

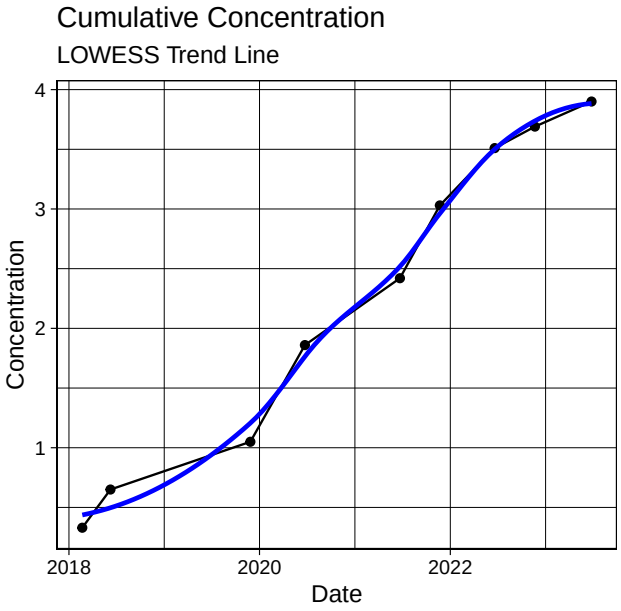




Kendall Trend Test Results Continuous	
n	9
z	-0.31
p	0.75
S	-4
varS	92
tau	-0.11
mean	0.43
sd	0.2
cov	0.47
results	STABLE

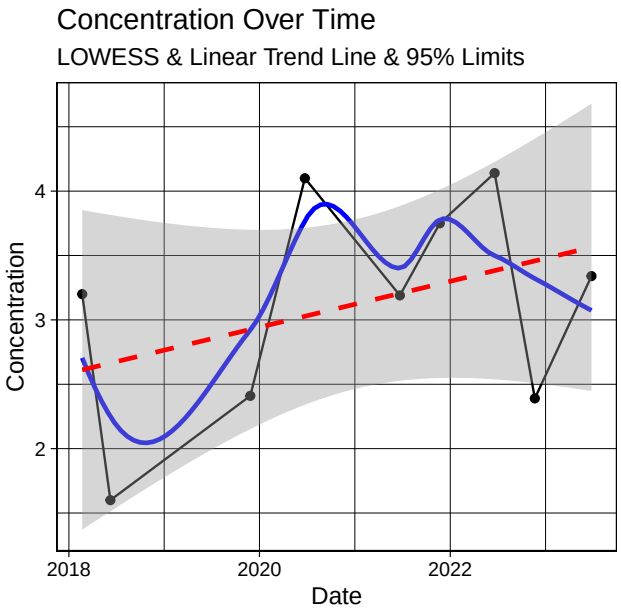
Report for ID : MW022 and Analyte : PFOA

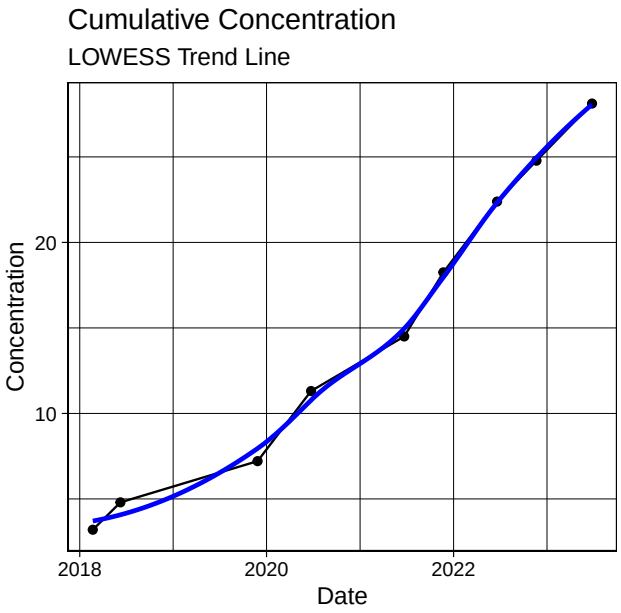




Kendall Trend Test Results Continuous	
n	9
z	0.73
p	0.47
S	8
varS	92
tau	0.22
mean	3.12
sd	0.85
cov	0.27
results	NO CLEAR TREND

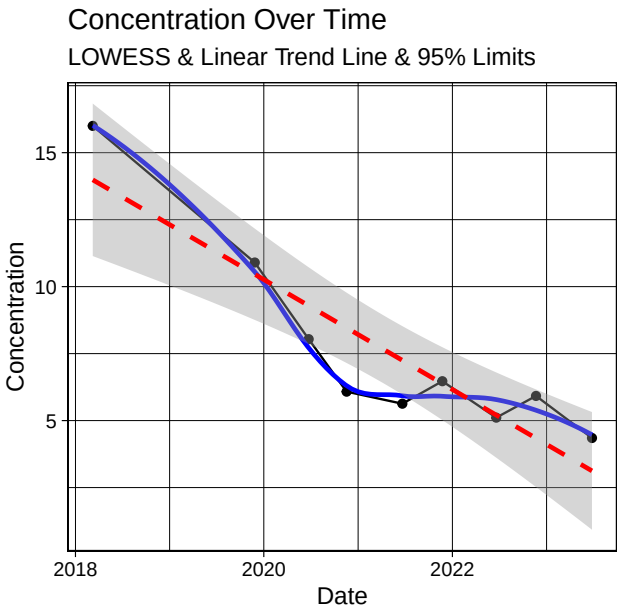
Report for ID : MW022 and Analyte : PFOS

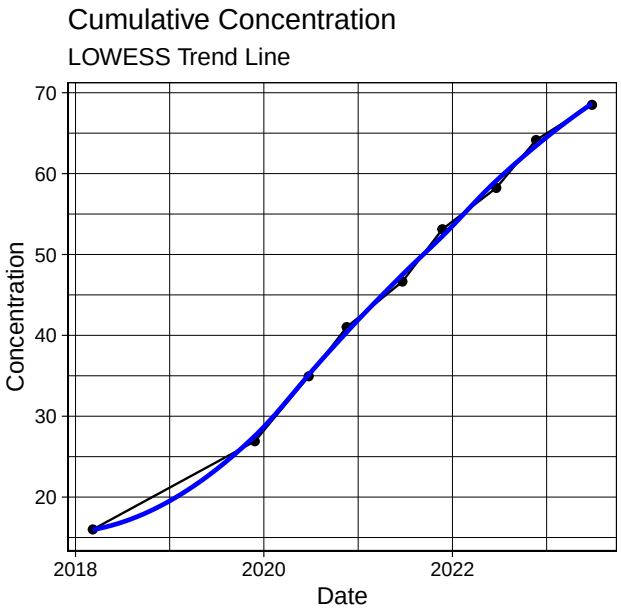




Kendall Trend Test Results Continuous	
n	9
z	-2.81
p	0
S	-28
varS	92
tau	-0.78
mean	7.61
sd	3.69
cov	0.48
results	DECREASING

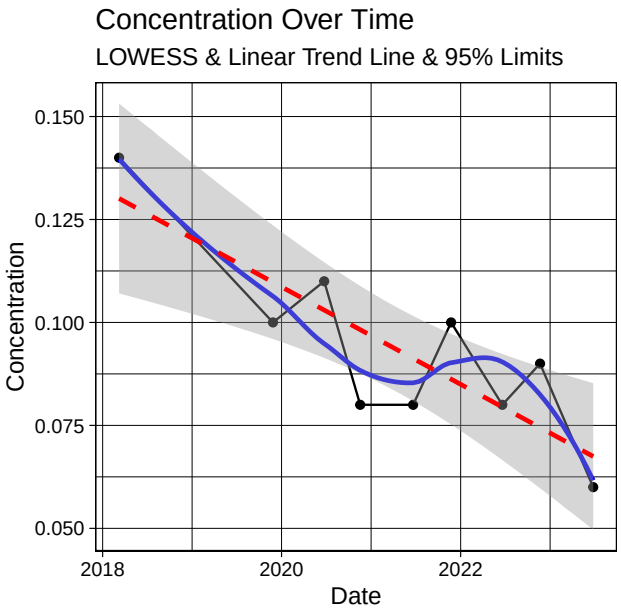
Report for ID : MW103D and Analyte : PFHxS+PFOS

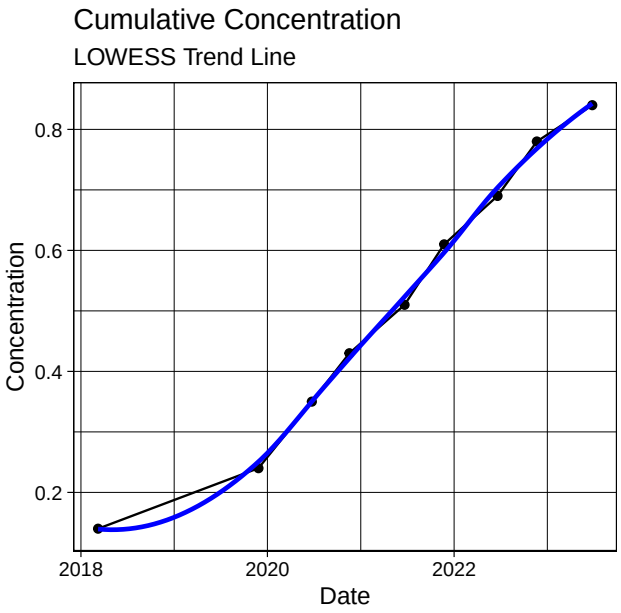




Kendall Trend Test Results Continuous	
n	9
z	-2.03
p	0.04
S	-20
varS	87.33
tau	-0.59
mean	0.09
sd	0.02
cov	0.25
results	DECREASING

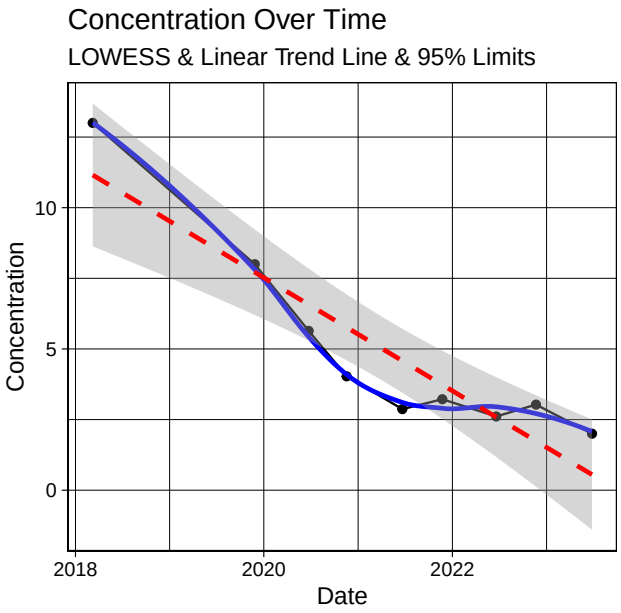
Report for ID : MW103D and Analyte : PFOA

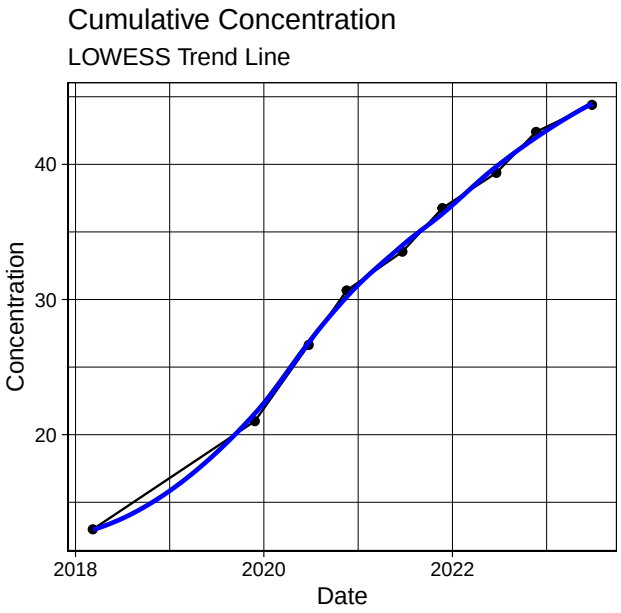




Kendall Trend Test Results Continuous	
n	9
z	-3.02
p	0
S	-30
varS	92
tau	-0.83
mean	4.93
sd	3.55
cov	0.72
results	DECREASING

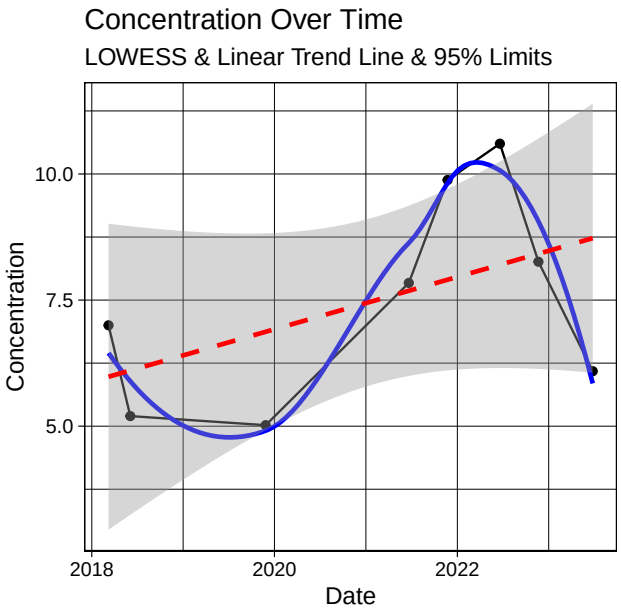
Report for ID : MW103D and Analyte : PFOS

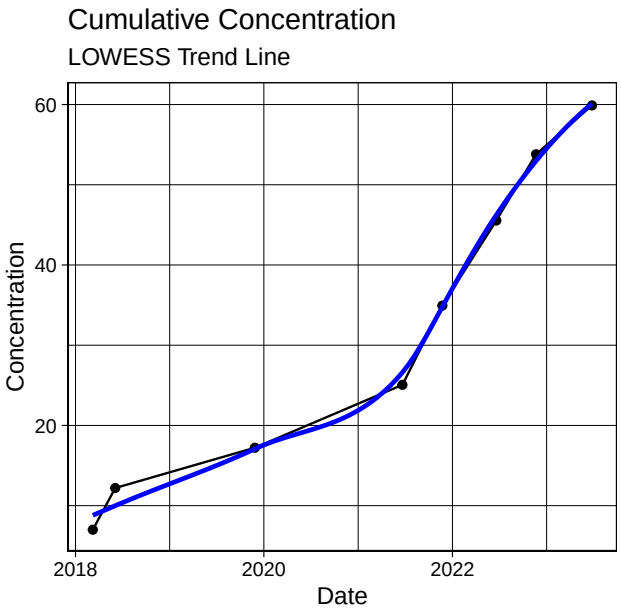




Kendall Trend Test Results Continuous	
n	8
z	0.87
p	0.39
S	8
varS	65.33
tau	0.29
mean	7.49
sd	2.06
cov	0.27
results	NO CLEAR TREND

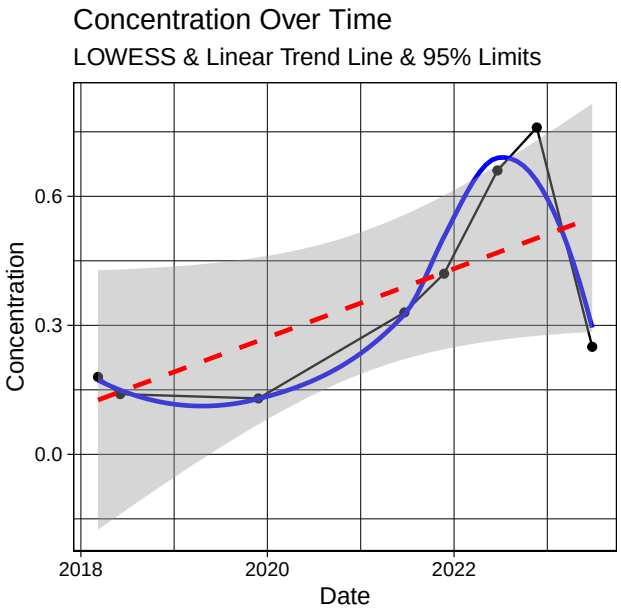
Report for ID : MW105S and Analyte : PFHxS+PFOS

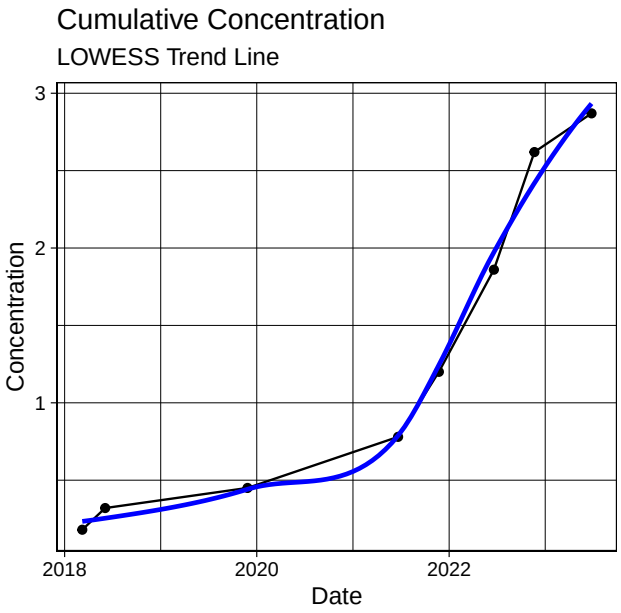




Kendall Trend Test Results Continuous	
n	8
z	1.61
p	0.11
S	14
varS	65.33
tau	0.5
mean	0.36
sd	0.24
cov	0.67
results	NO CLEAR TREND

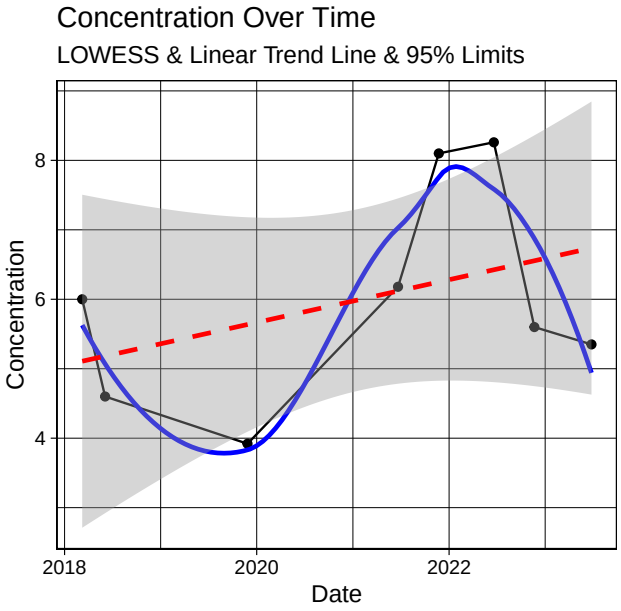
Report for ID : MW105S and Analyte : PFOA

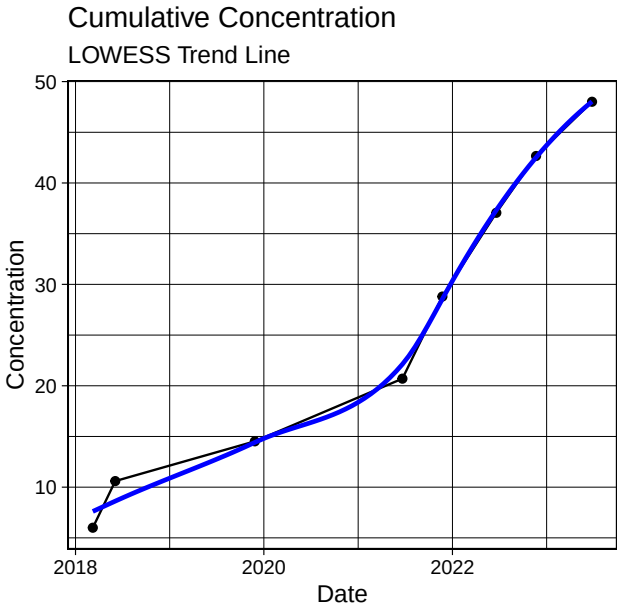




Kendall Trend Test Results Continuous	
n	8
z	0.37
p	0.71
S	4
varS	65.33
tau	0.14
mean	6
sd	1.53
cov	0.26
results	NO CLEAR TREND

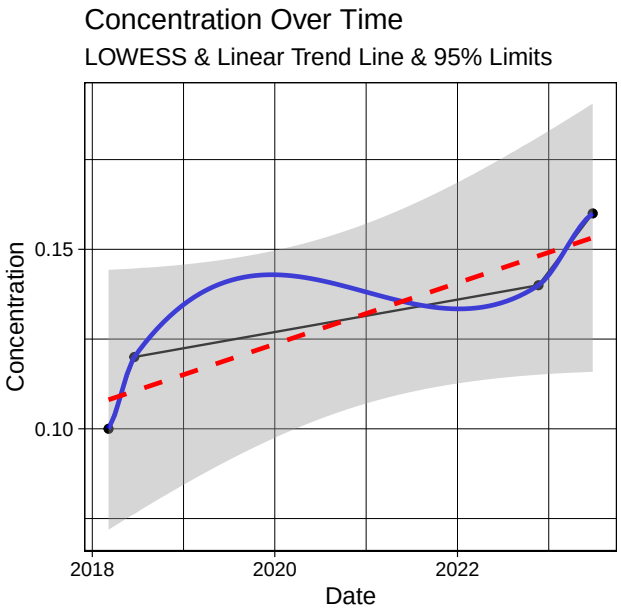
Report for ID : MW105S and Analyte : PFOS

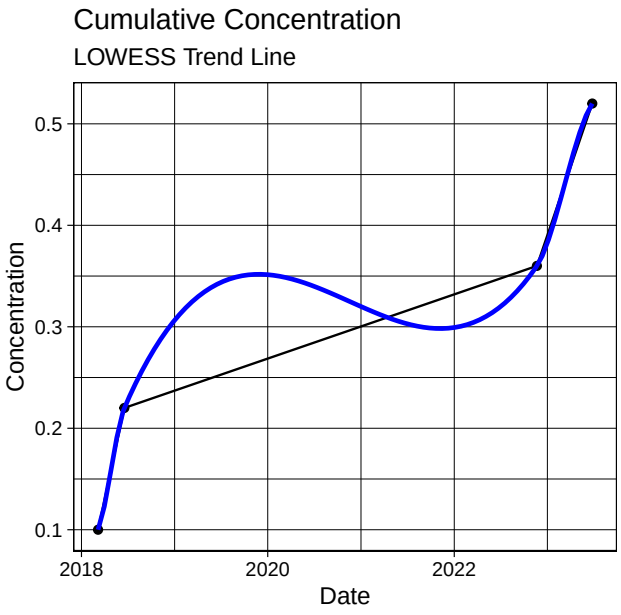




Kendall Trend Test Results Continuous	
n	4
z	1.7
p	0.09
S	6
varS	8.67
tau	1
mean	0.13
sd	0.03
cov	0.2
results	POSSIBLY INCREASING

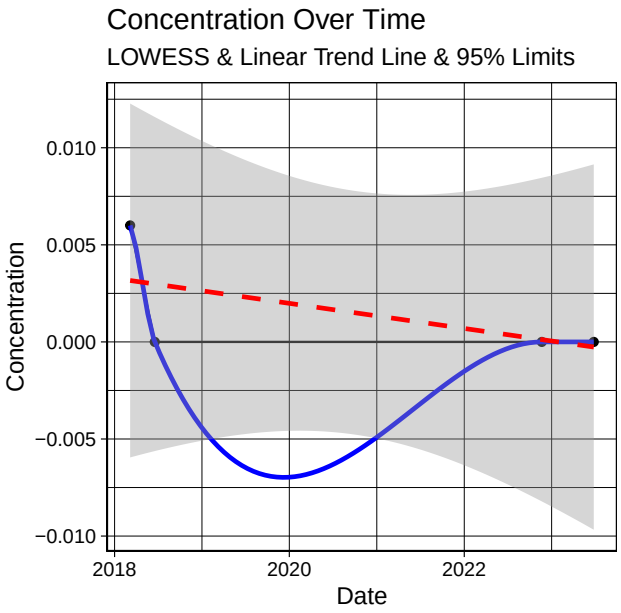
Report for ID : MW108 and Analyte : PFHxS+PFOS

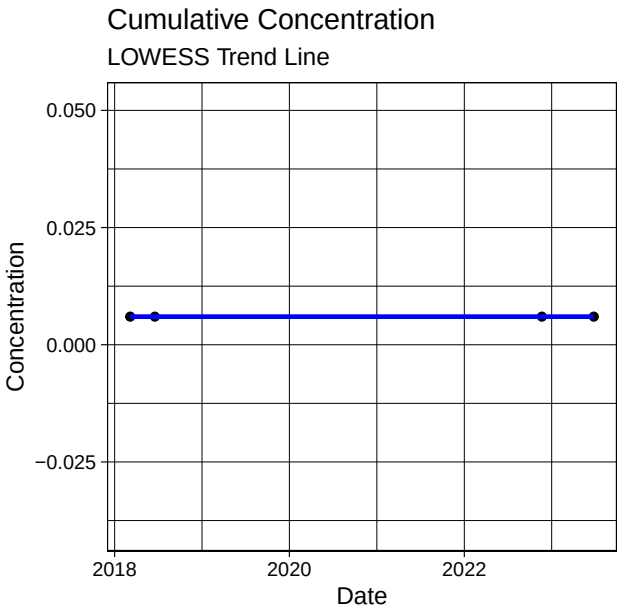




Kendall Trend Test Results Continuous	
n	4
z	-0.89
p	0.37
S	-3
varS	5
tau	-0.71
mean	0
sd	0
cov	2
results	NO CLEAR TREND

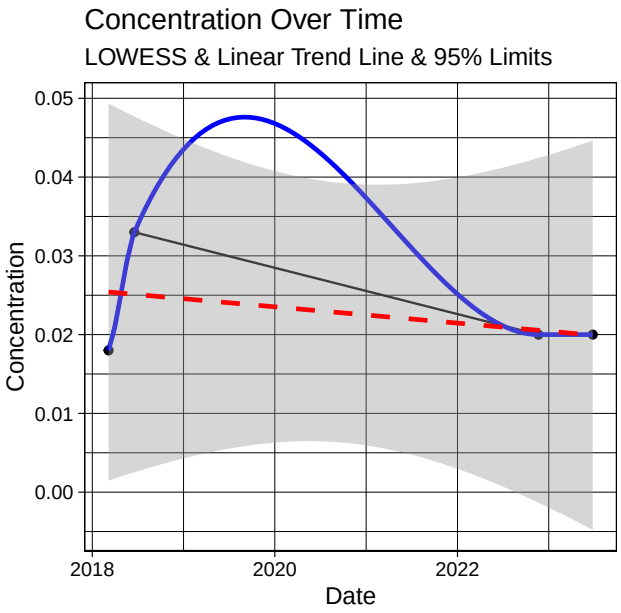
Report for ID : MW108 and Analyte : PFOA

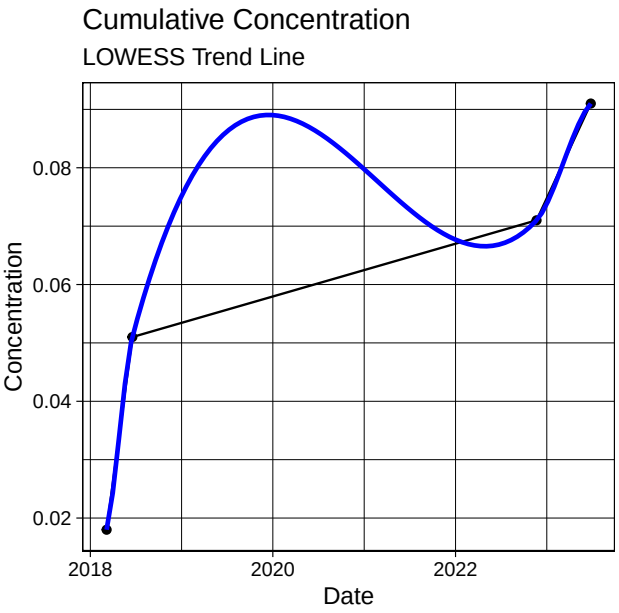




Kendall Trend Test Results Continuous	
n	4
z	0
p	1
S	1
varS	7.67
tau	0.18
mean	0.02
sd	0.01
cov	0.3
results	NO CLEAR TREND

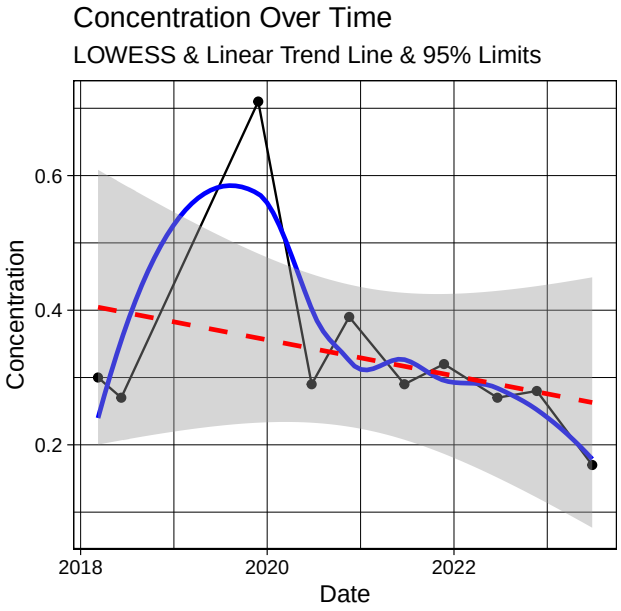
Report for ID : MW108 and Analyte : PFOS

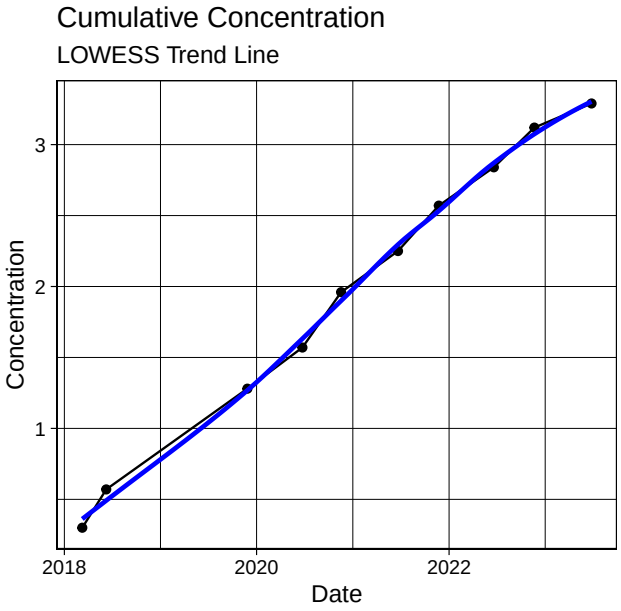




Kendall Trend Test Results Continuous	
n	10
z	-1.44
p	0.15
S	-17
varS	123
tau	-0.39
mean	0.33
sd	0.14
cov	0.44
results	STABLE

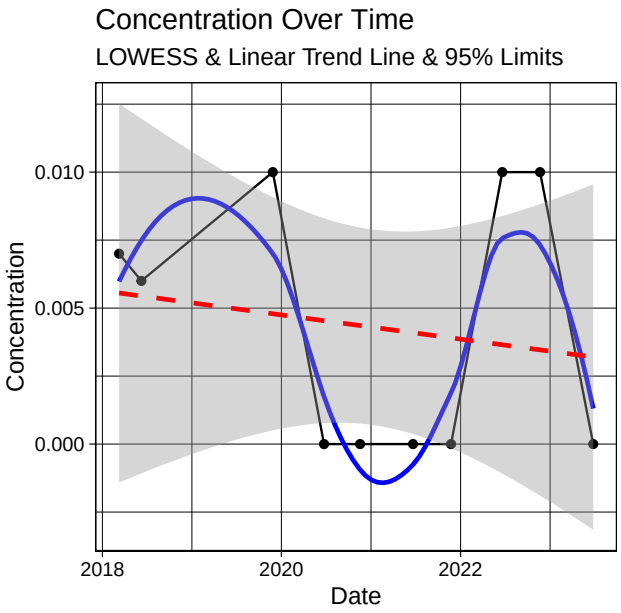
Report for ID : MW113 and Analyte : PFHxS+PFOS

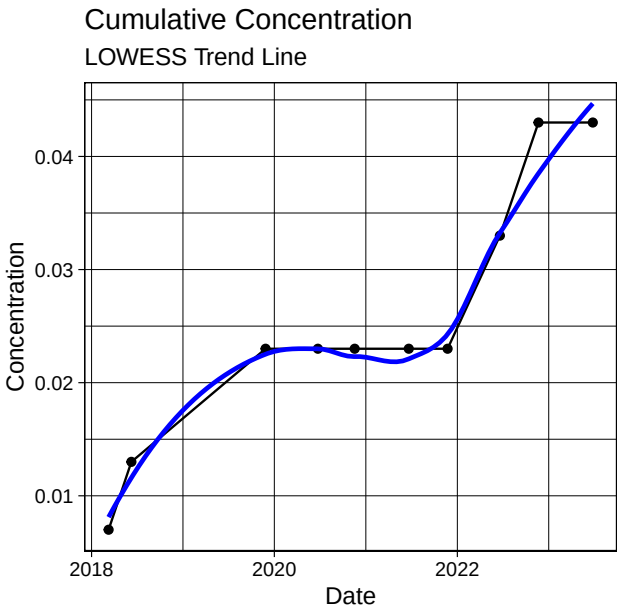




Kendall Trend Test Results Continuous	
n	10
z	-0.29
p	0.77
S	-4
varS	104.67
tau	-0.11
mean	0
sd	0
cov	1.1
results	NO CLEAR TREND

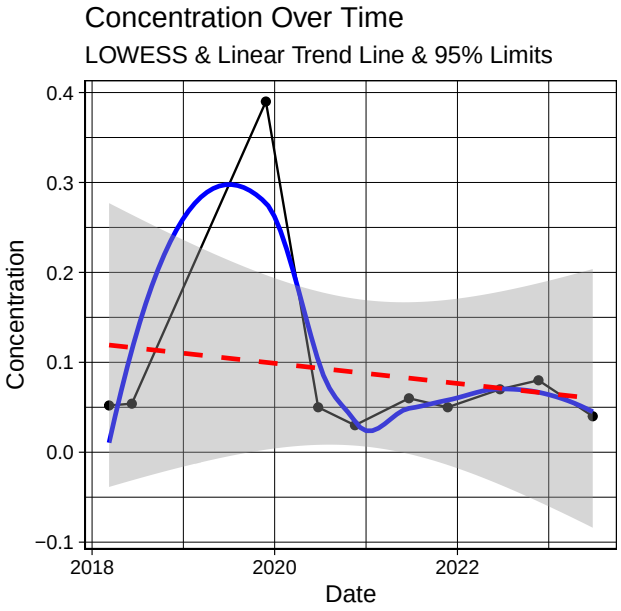
Report for ID : MW113 and Analyte : PFOA

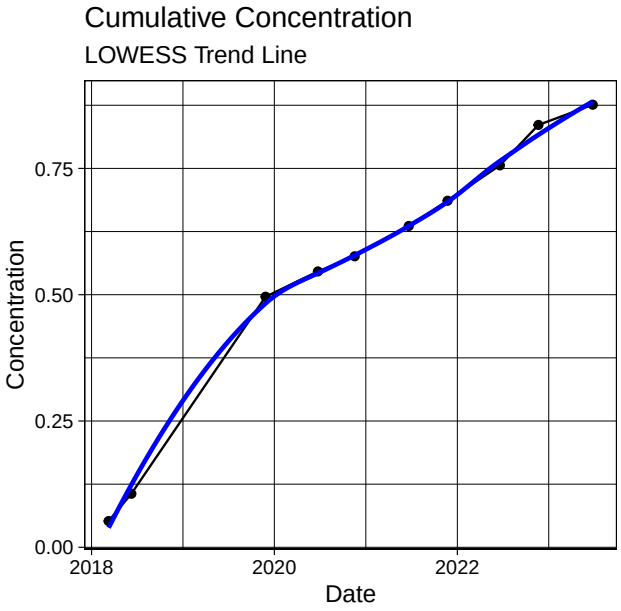




Kendall Trend Test Results Continuous	
n	10
z	0
p	1
S	0
varS	124
tau	0
mean	0.09
sd	0.11
cov	1.22
results	NO CLEAR TREND

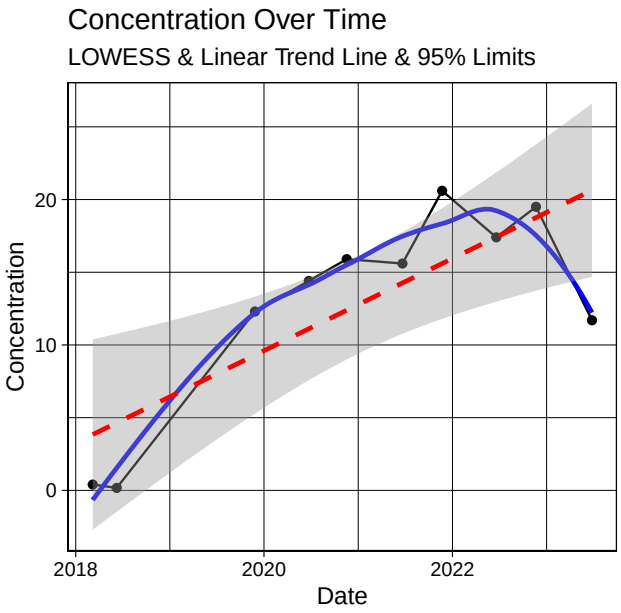
Report for ID : MW113 and Analyte : PFOS

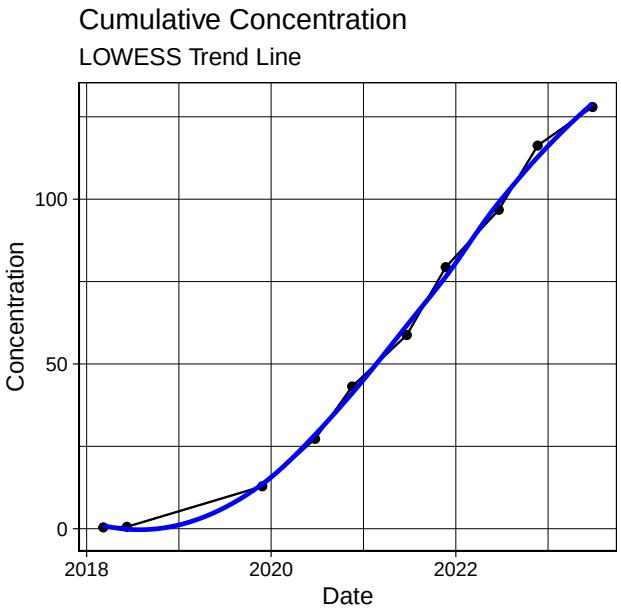




Kendall Trend Test Results Continuous	
n	10
z	1.97
p	0.05
S	23
varS	125
tau	0.51
mean	12.8
sd	7.16
cov	0.56
results	INCREASING

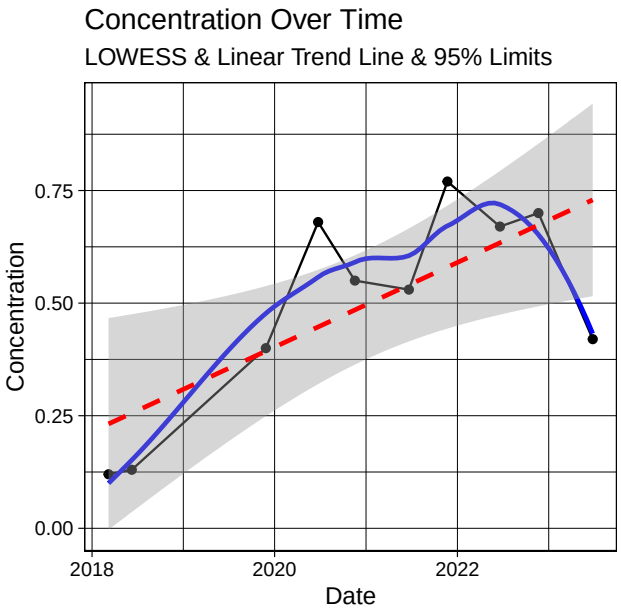
Report for ID : MW115 and Analyte : PFHxS+PFOS

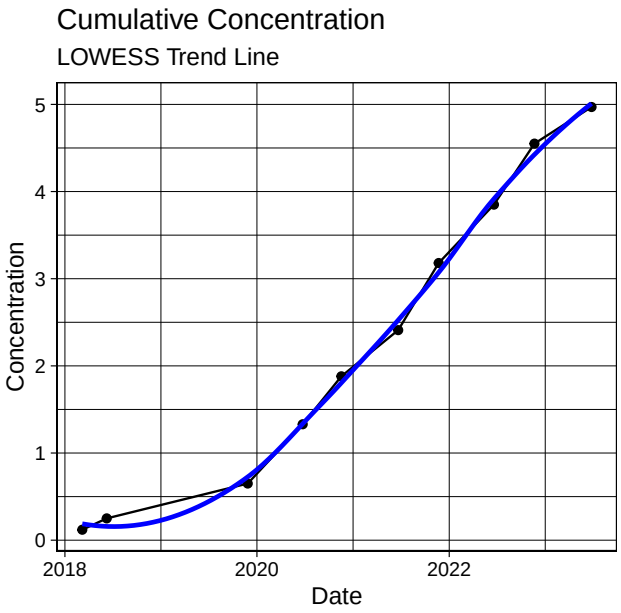




Kendall Trend Test Results Continuous	
n	10
z	1.79
p	0.07
S	21
varS	125
tau	0.47
mean	0.5
sd	0.23
cov	0.46
results	POSSIBLY INCREASING

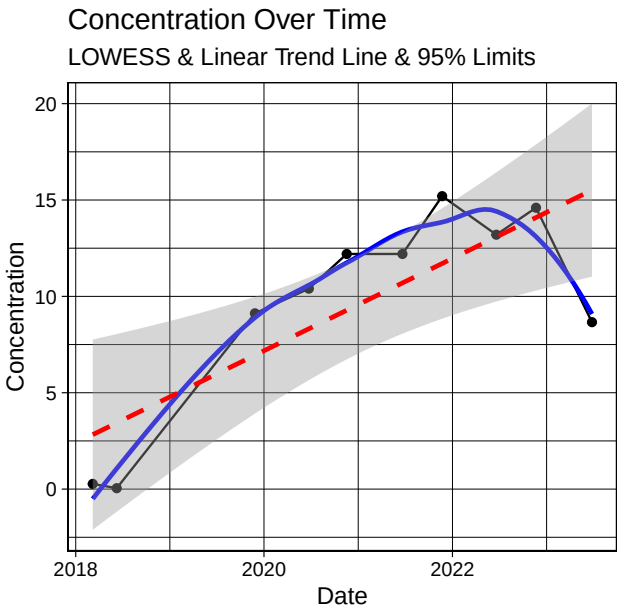
Report for ID : MW115 and Analyte : PFOA

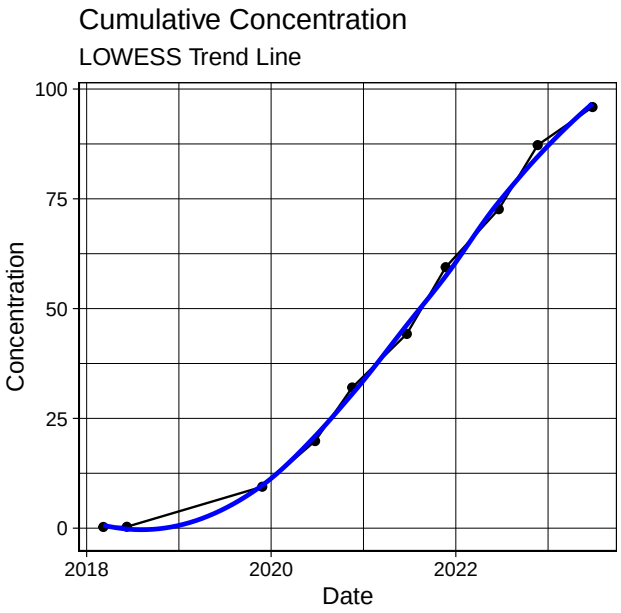




Kendall Trend Test Results Continuous	
n	10
z	2.07
p	0.04
S	24
varS	124
tau	0.54
mean	9.59
sd	5.4
cov	0.56
results	INCREASING

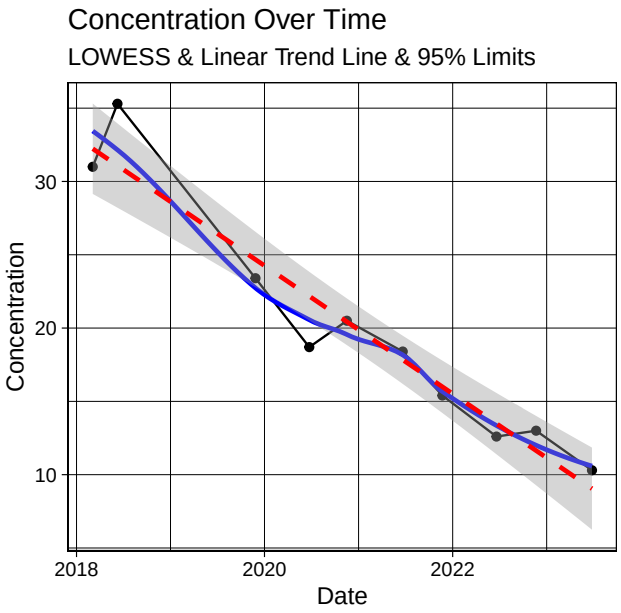
Report for ID : MW115 and Analyte : PFOS

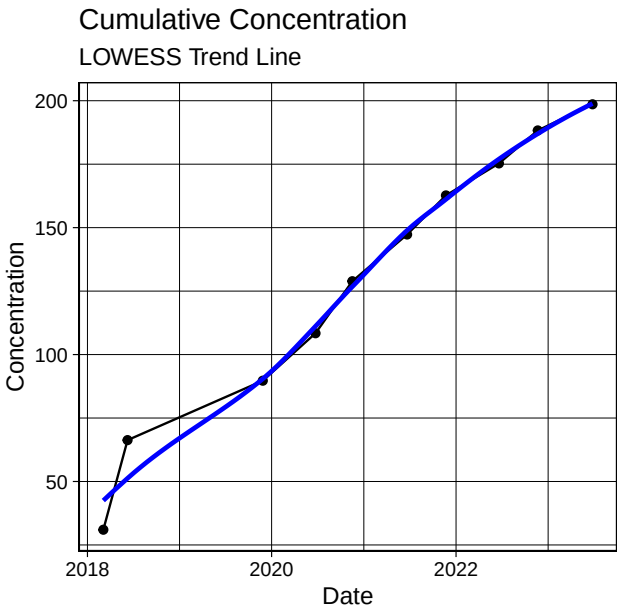




Kendall Trend Test Results Continuous	
n	10
z	-3.4
p	0
S	-39
varS	125
tau	-0.87
mean	19.86
sd	8.1
cov	0.41
results	DECREASING

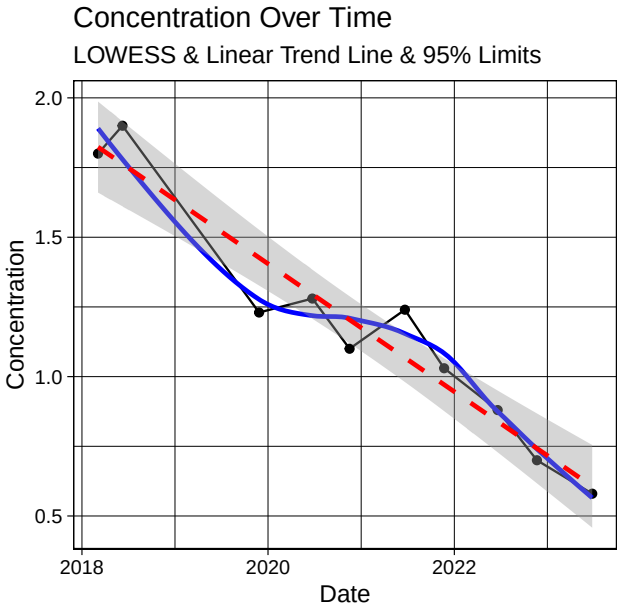
Report for ID : MW118D and Analyte : PFHxS+PFOS

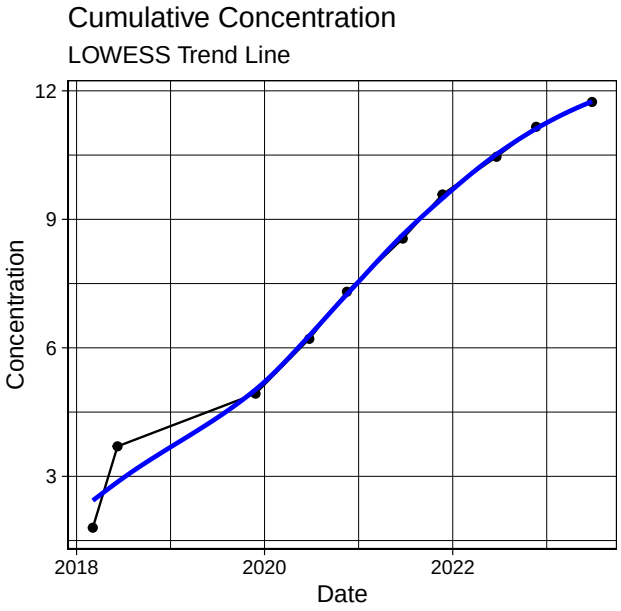




Kendall Trend Test Results Continuous	
n	10
z	-3.22
p	0
S	-37
varS	125
tau	-0.82
mean	1.17
sd	0.43
cov	0.36
results	DECREASING

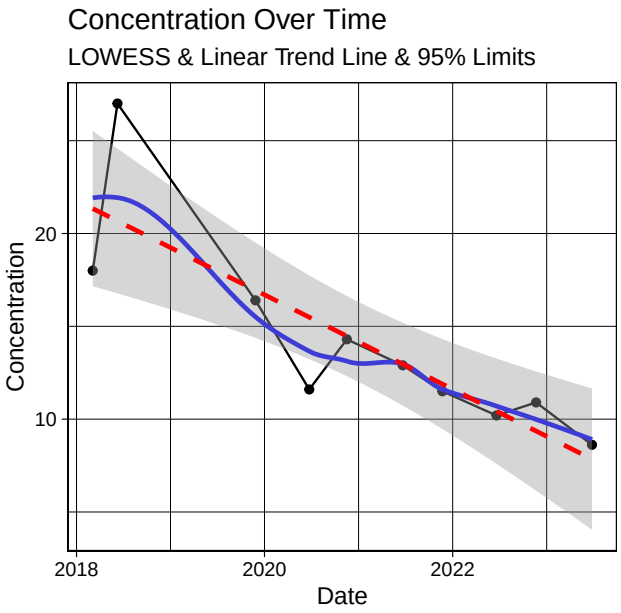
Report for ID : MW118D and Analyte : PFOA

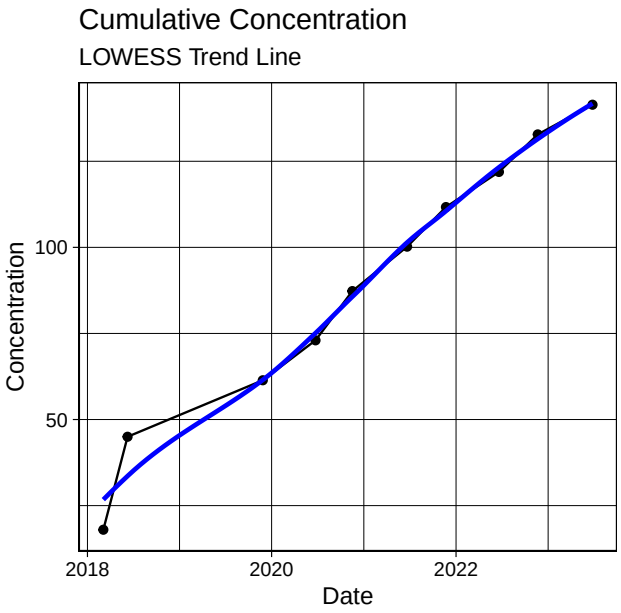




Kendall Trend Test Results Continuous	
n	10
z	-3.22
p	0
S	-37
varS	125
tau	-0.82
mean	14.14
sd	5.34
cov	0.38
results	DECREASING

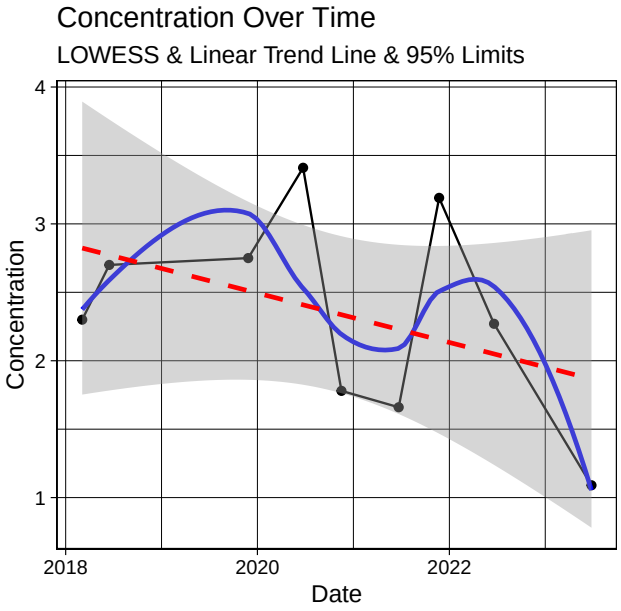
Report for ID : MW118D and Analyte : PFOS

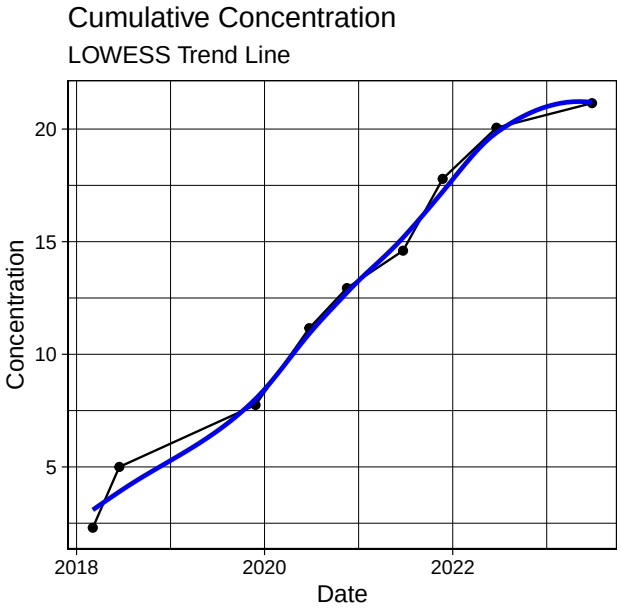




Kendall Trend Test Results Continuous	
n	9
z	-0.94
p	0.35
S	-10
varS	92
tau	-0.28
mean	2.35
sd	0.75
cov	0.32
results	STABLE

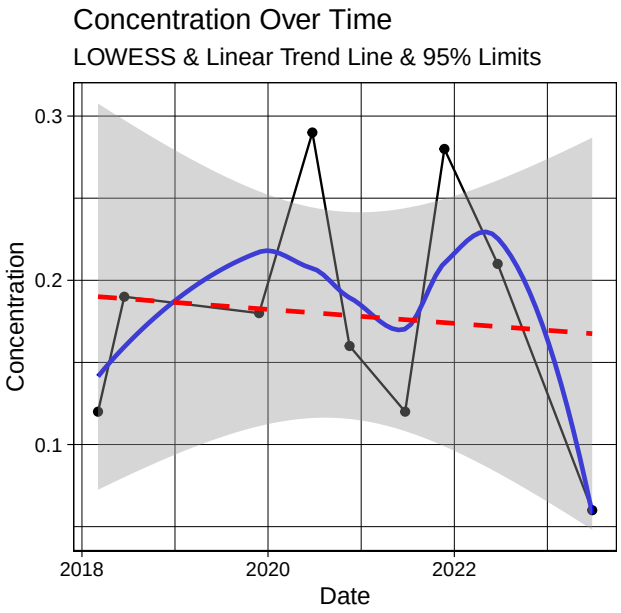
Report for ID : MW122 and Analyte : PFHxS+PFOS

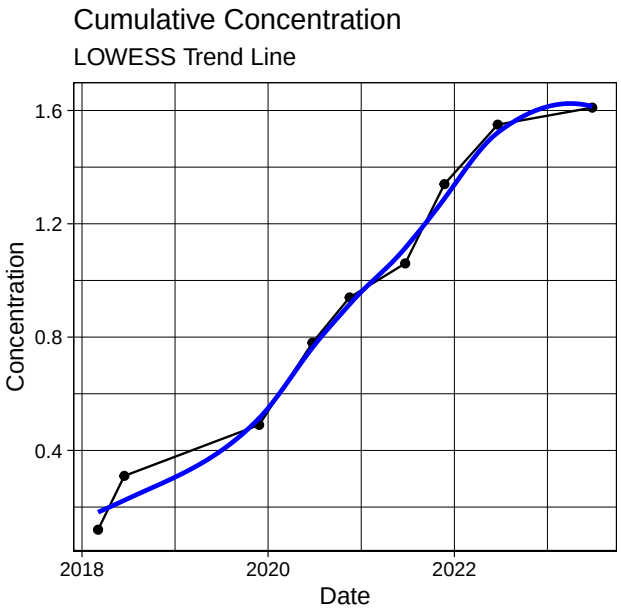




Kendall Trend Test Results Continuous	
n	9
z	-0.21
p	0.83
S	-3
varS	91
tau	-0.08
mean	0.18
sd	0.08
cov	0.42
results	STABLE

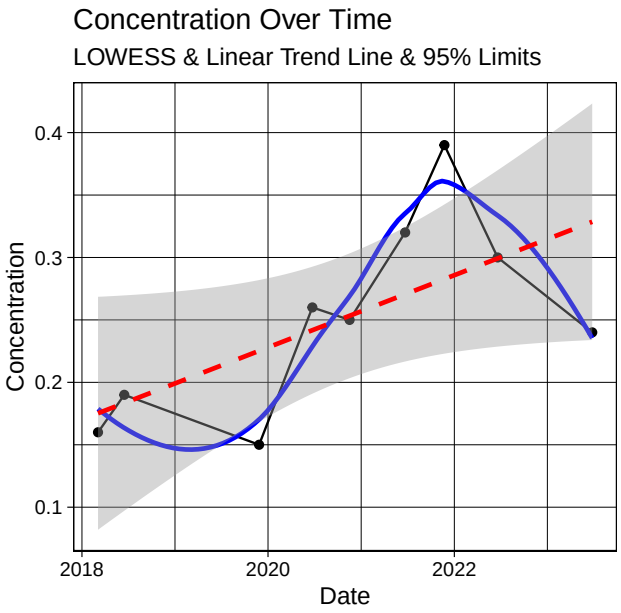
Report for ID : MW122 and Analyte : PFOA

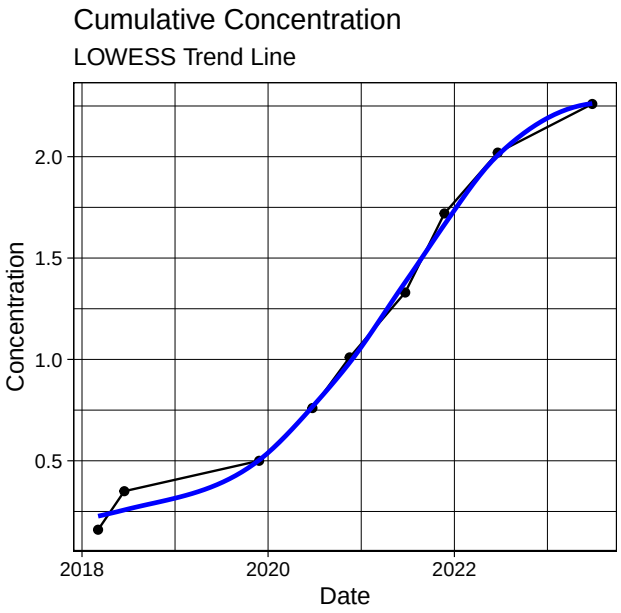




Kendall Trend Test Results Continuous	
n	9
z	1.56
p	0.12
S	16
varS	92
tau	0.44
mean	0.25
sd	0.08
cov	0.31
results	NO CLEAR TREND

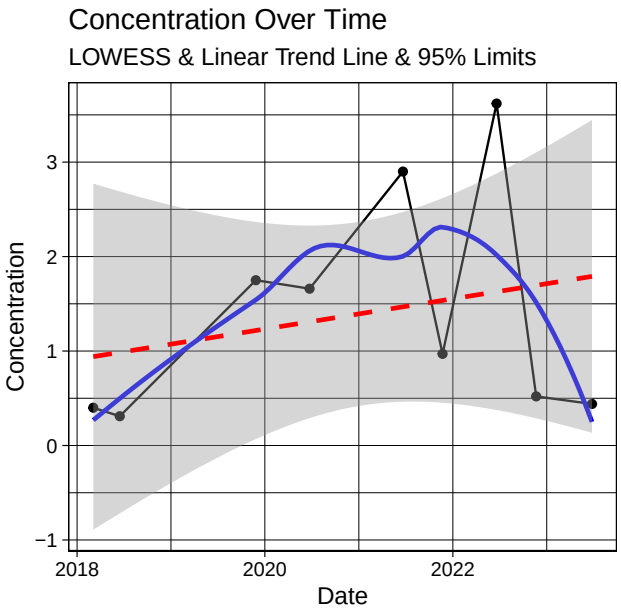
Report for ID : MW122 and Analyte : PFOS

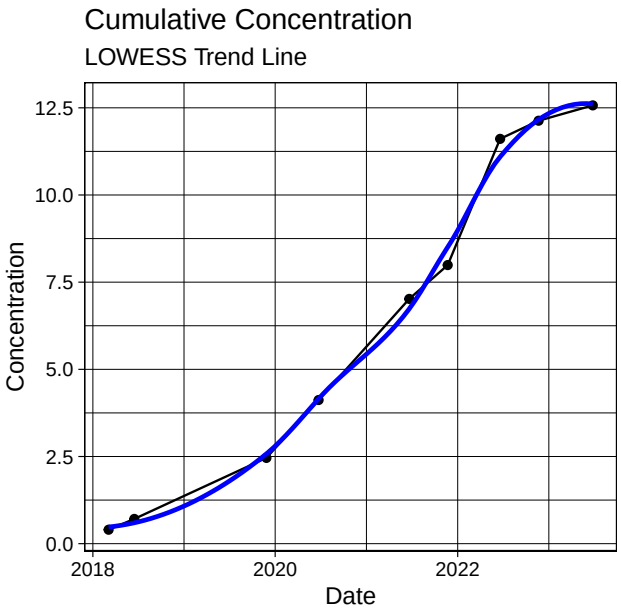




Kendall Trend Test Results Continuous	
n	9
z	0.31
p	0.75
S	4
varS	92
tau	0.11
mean	1.4
sd	1.2
cov	0.86
results	NO CLEAR TREND

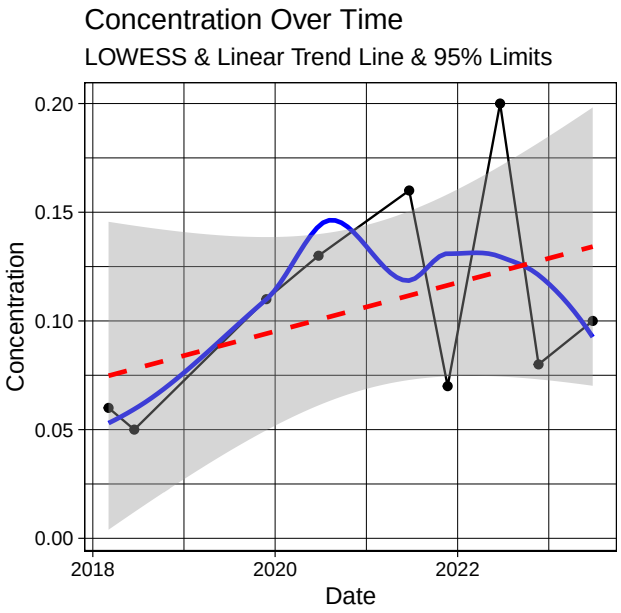
Report for ID : MW126 and Analyte : PFHxS+PFOS

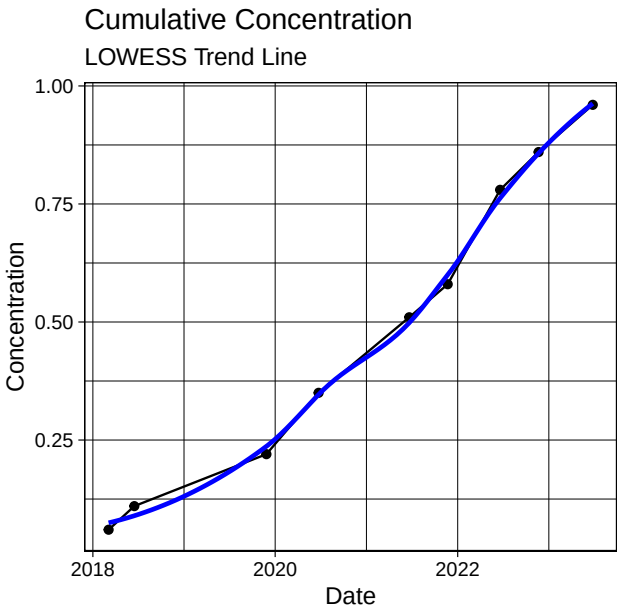




Kendall Trend Test Results Continuous	
n	9
z	1.15
p	0.25
S	12
varS	92
tau	0.33
mean	0.11
sd	0.05
cov	0.46
results	NO CLEAR TREND

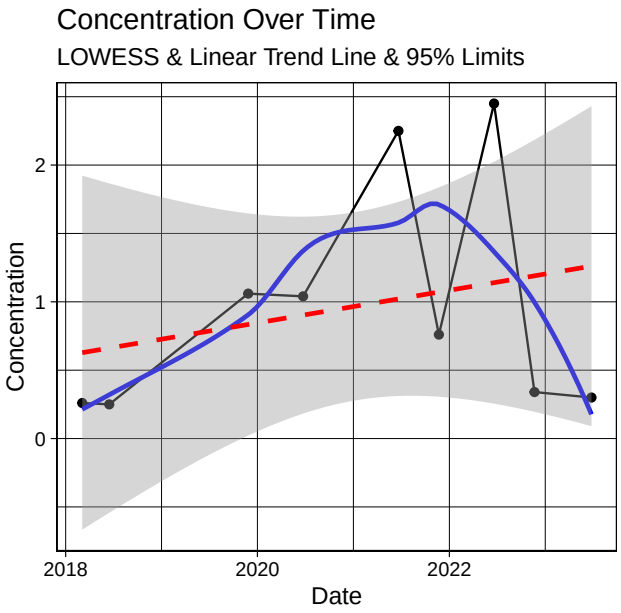
Report for ID : MW126 and Analyte : PFOA

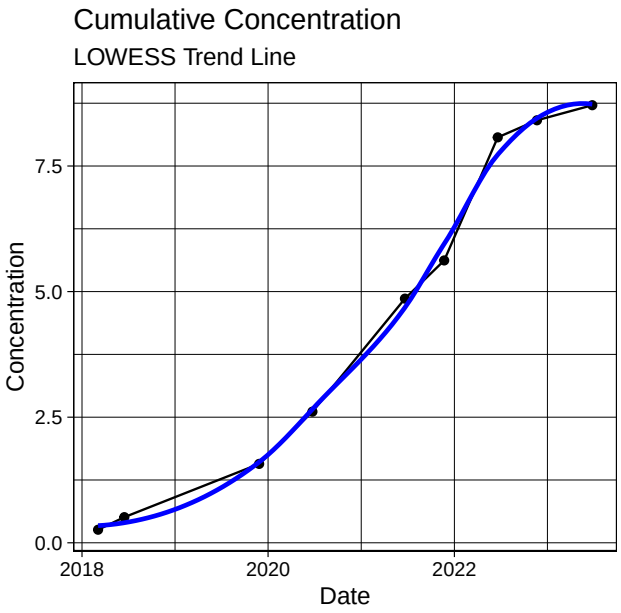




Kendall Trend Test Results Continuous	
n	9
z	0.31
p	0.75
S	4
varS	92
tau	0.11
mean	0.97
sd	0.85
cov	0.88
results	NO CLEAR TREND

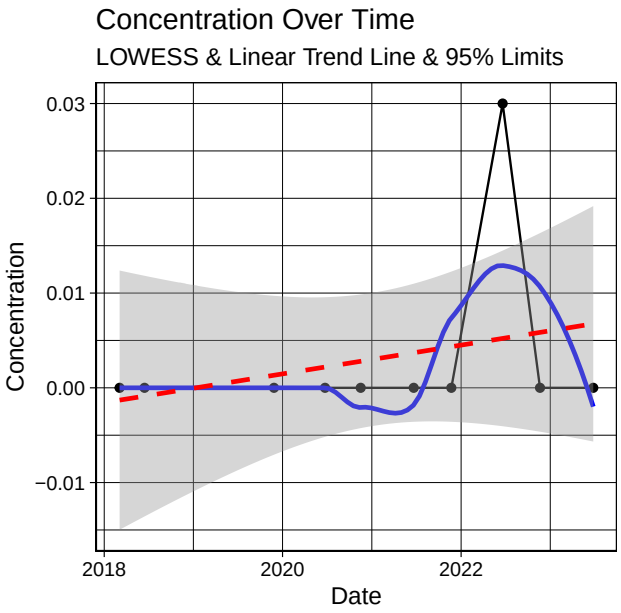
Report for ID : MW126 and Analyte : PFOS

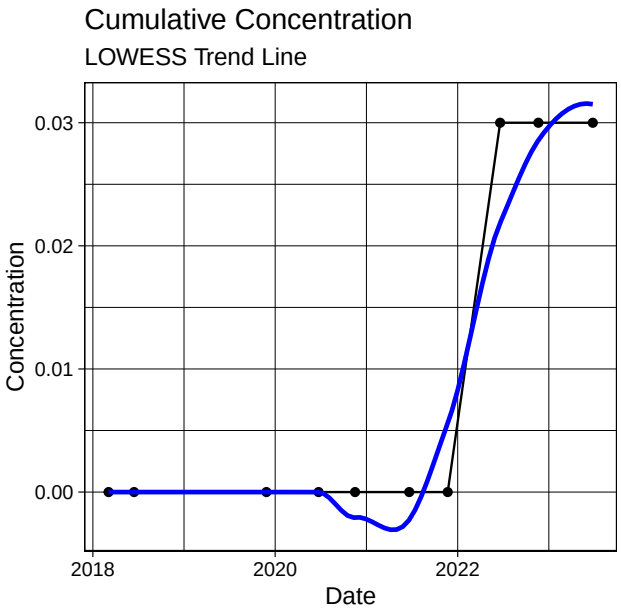




Kendall Trend Test Results Continuous	
n	10
z	0.7
p	0.49
S	5
varS	33
tau	0.25
mean	0
sd	0.01
cov	3.16
results	NO CLEAR TREND

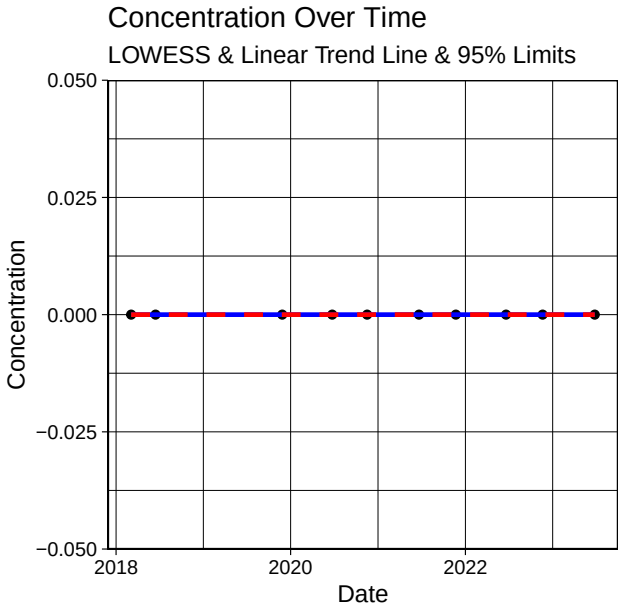
Report for ID : MW128 and Analyte : PFHxS+PFOS

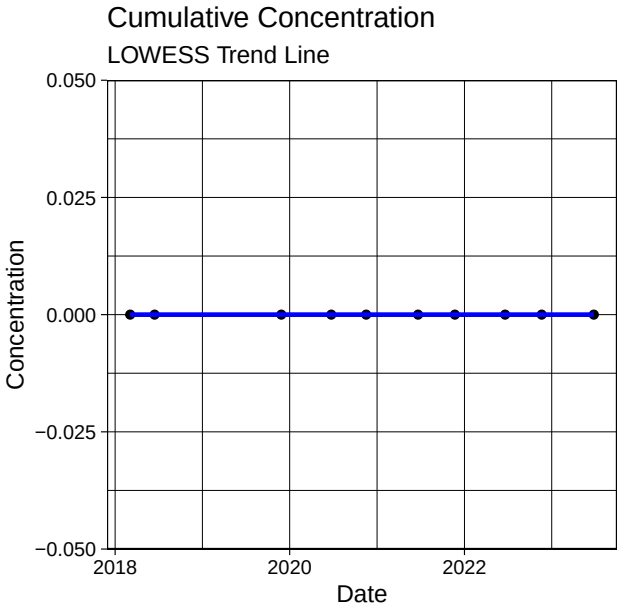




Kendall Trend Test Results Continuous	
n	10
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

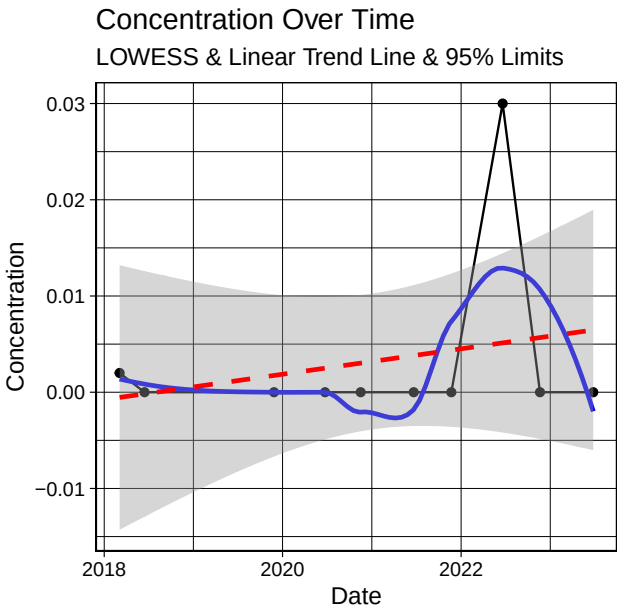
Report for ID : MW128 and Analyte : PFOA

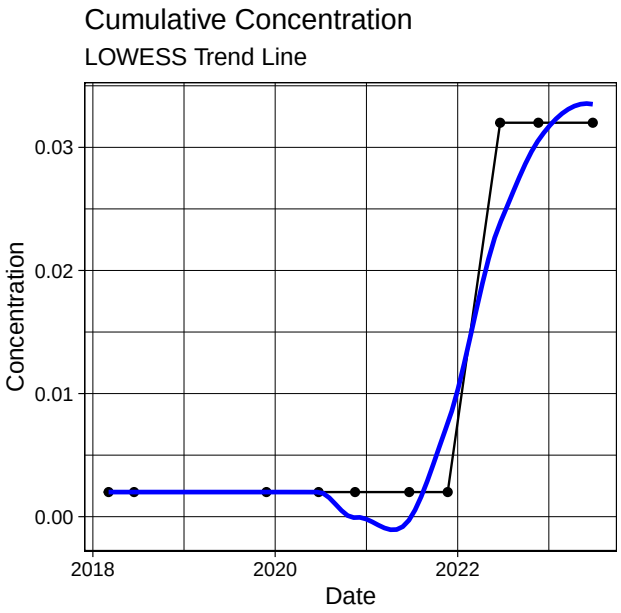




Kendall Trend Test Results Continuous	
n	10
z	-0.26
p	0.8
S	-3
varS	59.67
tau	-0.11
mean	0
sd	0.01
cov	2.95
results	NO CLEAR TREND

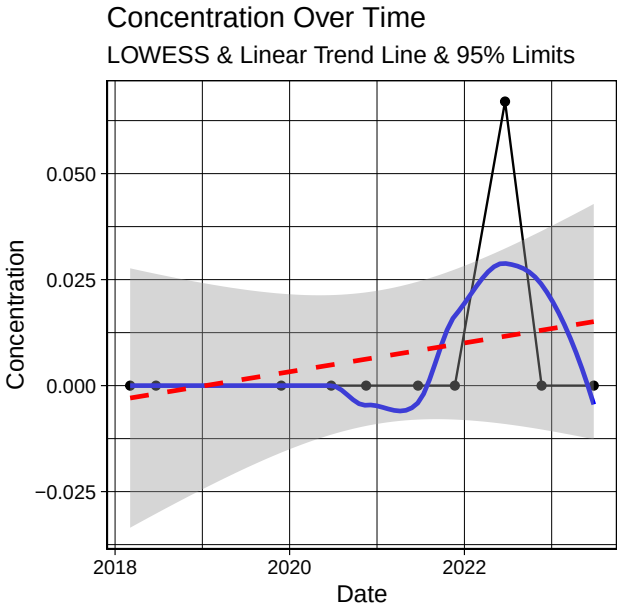
Report for ID : MW128 and Analyte : PFOS

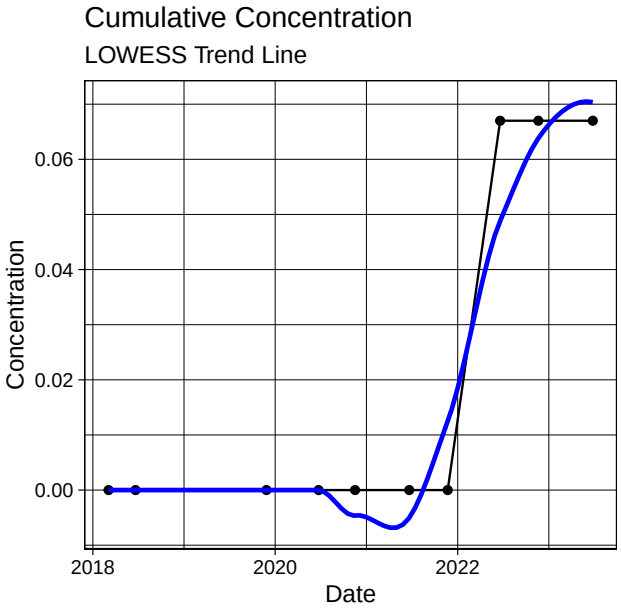




Kendall Trend Test Results Continuous	
n	10
z	0.7
p	0.49
S	5
varS	33
tau	0.25
mean	0.01
sd	0.02
cov	3.16
results	NO CLEAR TREND

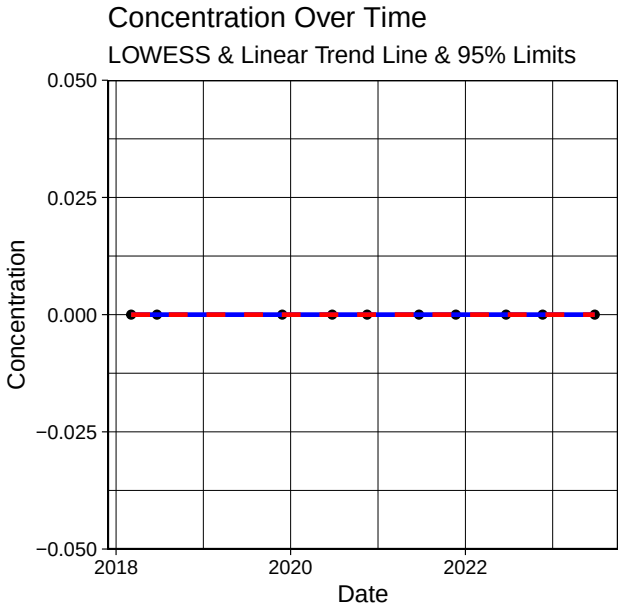
Report for ID : MW129 and Analyte : PFHxS+PFOS

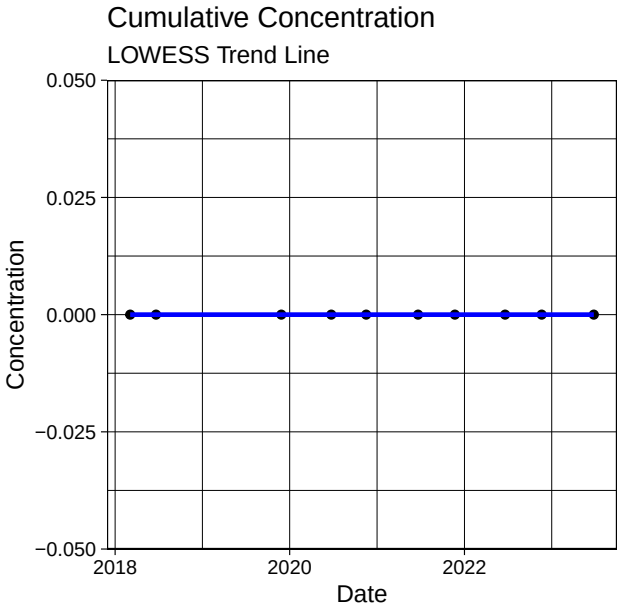




Kendall Trend Test Results Continuous	
n	10
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

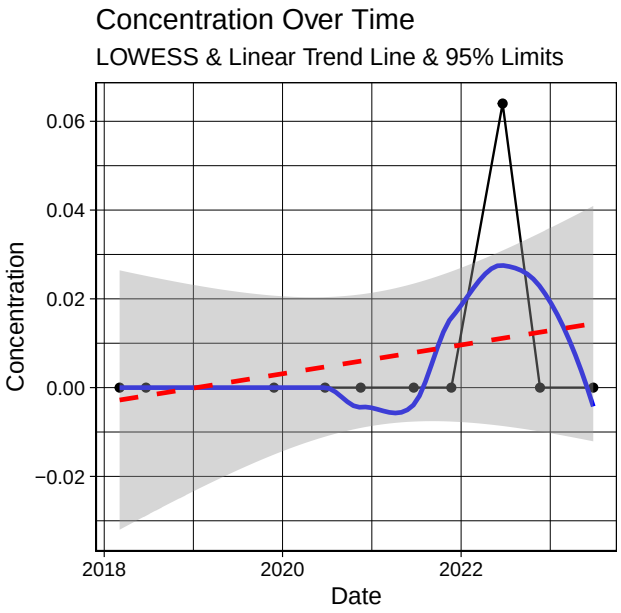
Report for ID : MW129 and Analyte : PFOA

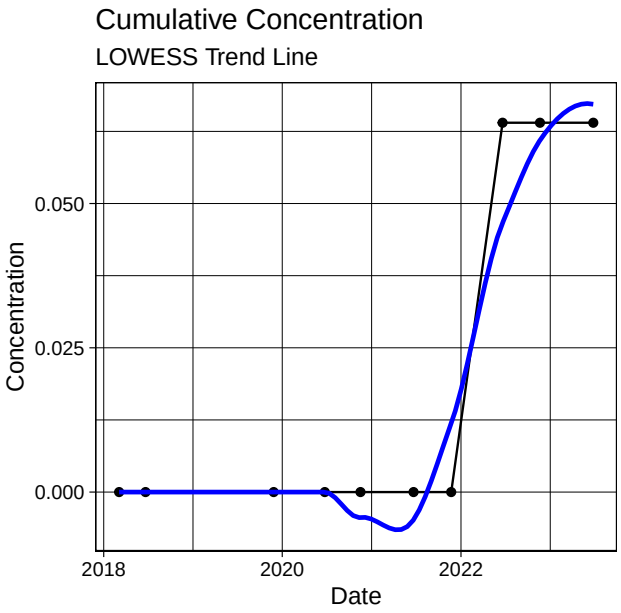




Kendall Trend Test Results Continuous	
n	10
z	0.7
p	0.49
S	5
varS	33
tau	0.25
mean	0.01
sd	0.02
cov	3.16
results	NO CLEAR TREND

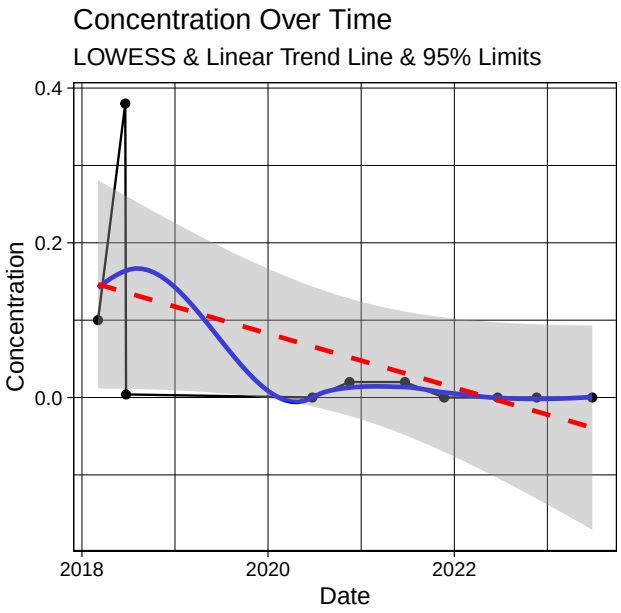
Report for ID : MW129 and Analyte : PFOS

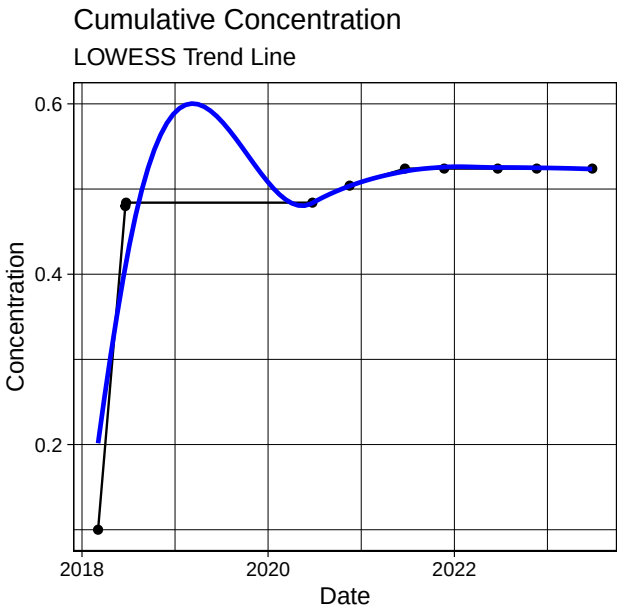




Kendall Trend Test Results Continuous	
n	10
z	-2.22
p	0.03
S	-24
varS	107.33
tau	-0.61
mean	0.05
sd	0.12
cov	2.27
results	DECREASING

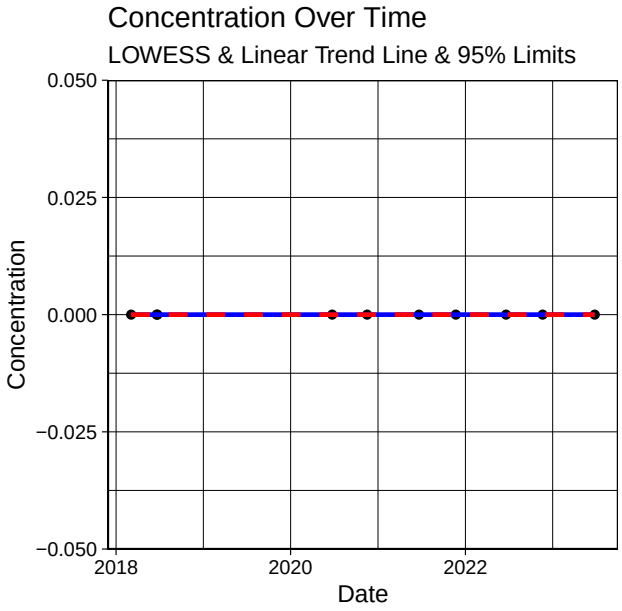
Report for ID : MW130 and Analyte : PFHxS+PFOS

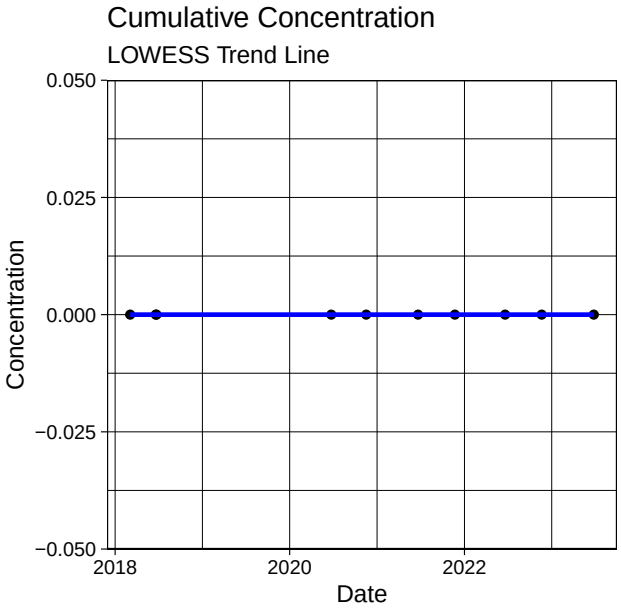




Kendall Trend Test Results Continuous	
n	10
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

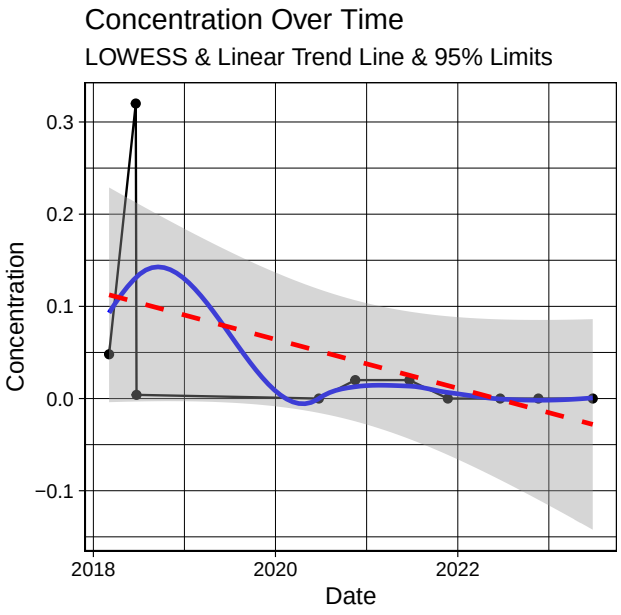
Report for ID : MW130 and Analyte : PFOA

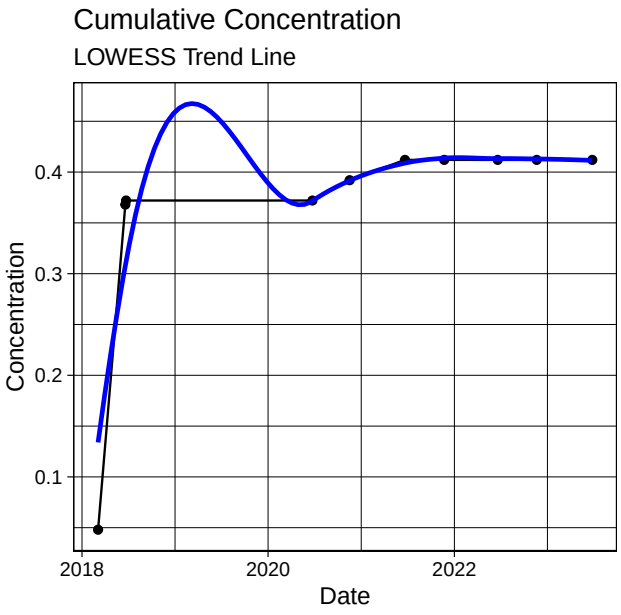




Kendall Trend Test Results Continuous	
n	10
z	-2.22
p	0.03
S	-24
varS	107.33
tau	-0.61
mean	0.04
sd	0.1
cov	2.41
results	DECREASING

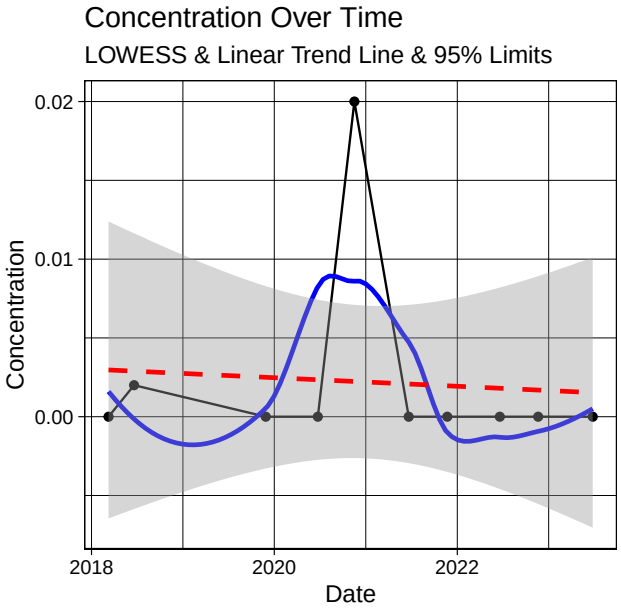
Report for ID : MW130 and Analyte : PFOS

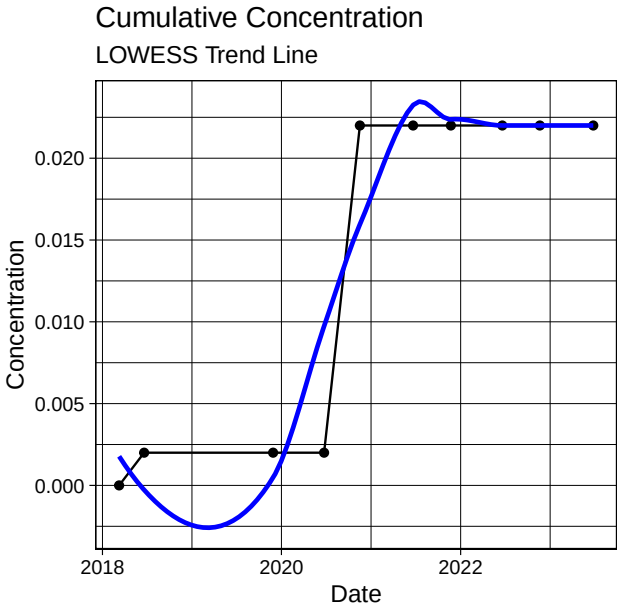




Kendall Trend Test Results Continuous	
n	10
z	-0.78
p	0.44
S	-7
varS	59.67
tau	-0.25
mean	0
sd	0.01
cov	2.86
results	NO CLEAR TREND

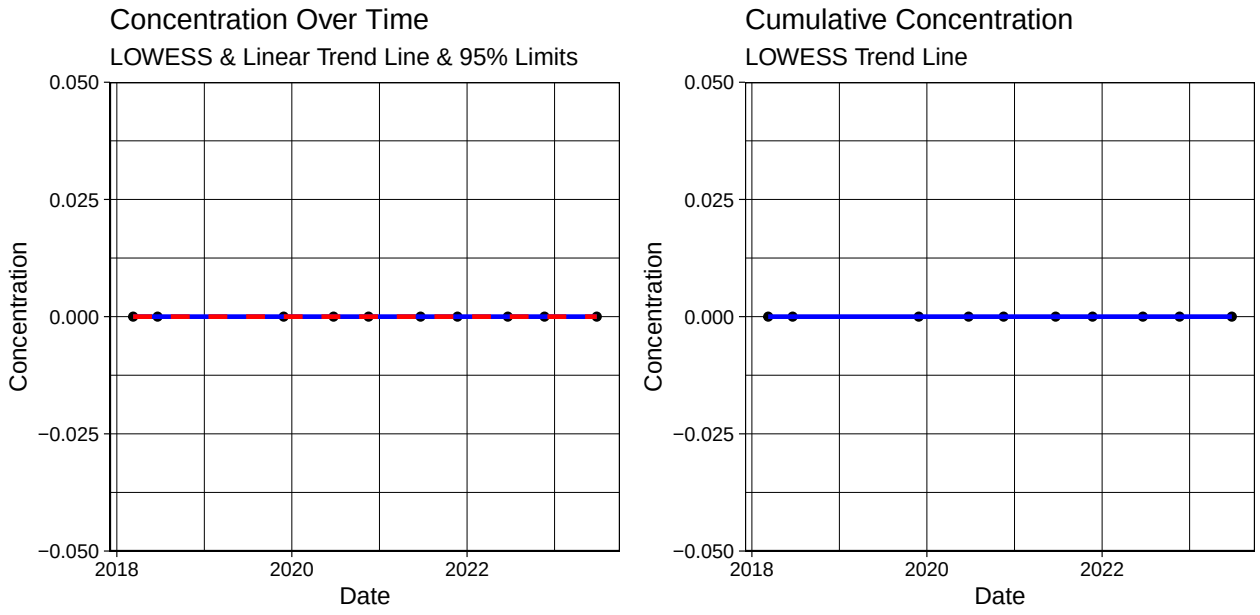
Report for ID : MW131 and Analyte : PFHxS+PFOS





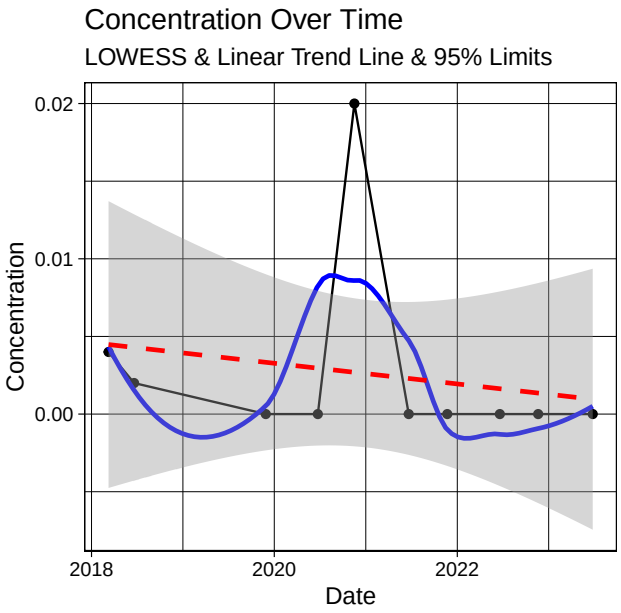
Kendall Trend Test Results Continuous	
n	10
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

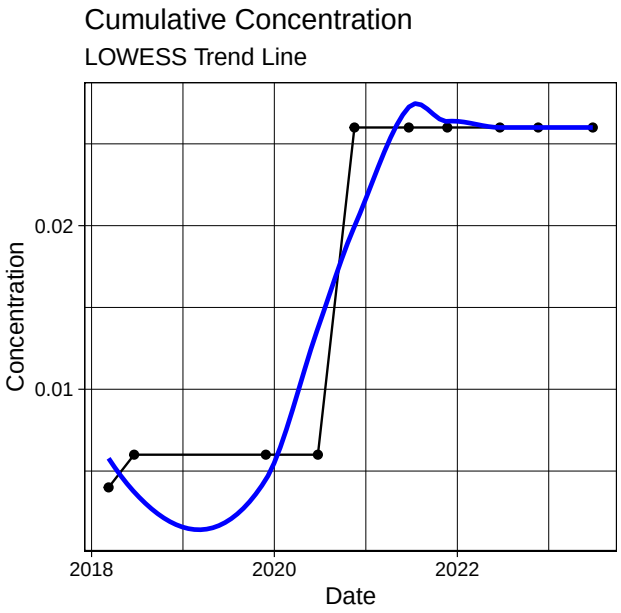
Report for ID : MW131 and Analyte : PFOA



Kendall Trend Test Results Continuous	
n	10
z	-1.67
p	0.09
S	-16
varS	80.67
tau	-0.49
mean	0
sd	0.01
cov	2.41
results	POSSIBLY DECREASING

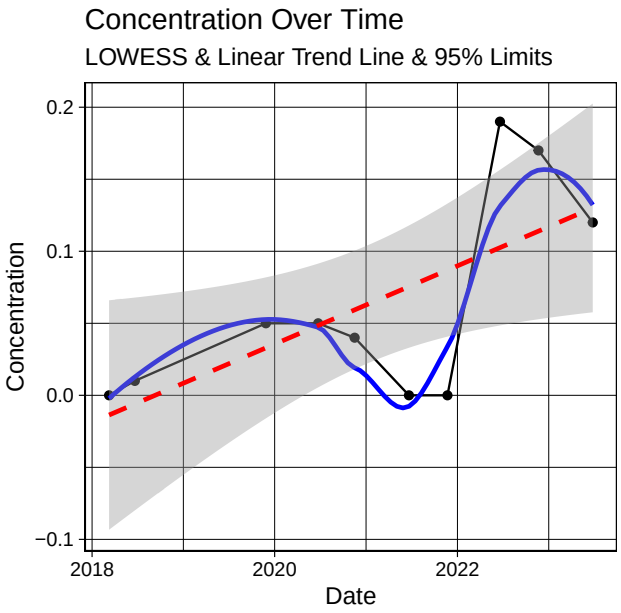
Report for ID : MW131 and Analyte : PFOS

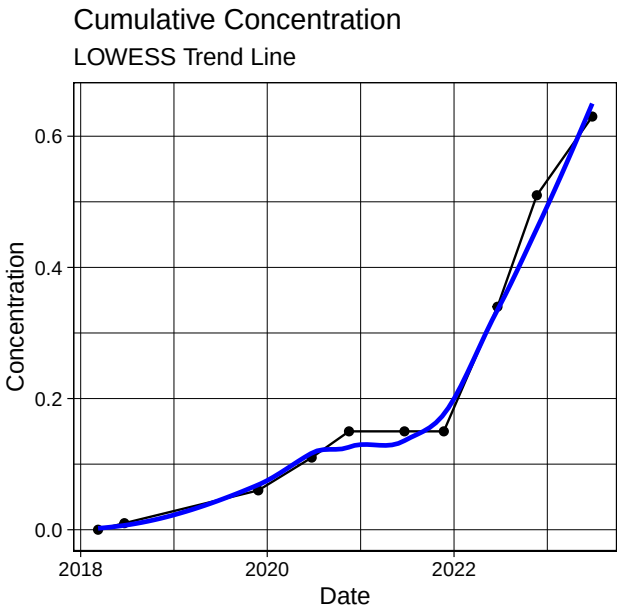




Kendall Trend Test Results Continuous	
n	10
z	1.28
p	0.2
S	15
varS	120.33
tau	0.35
mean	0.06
sd	0.07
cov	1.14
results	NO CLEAR TREND

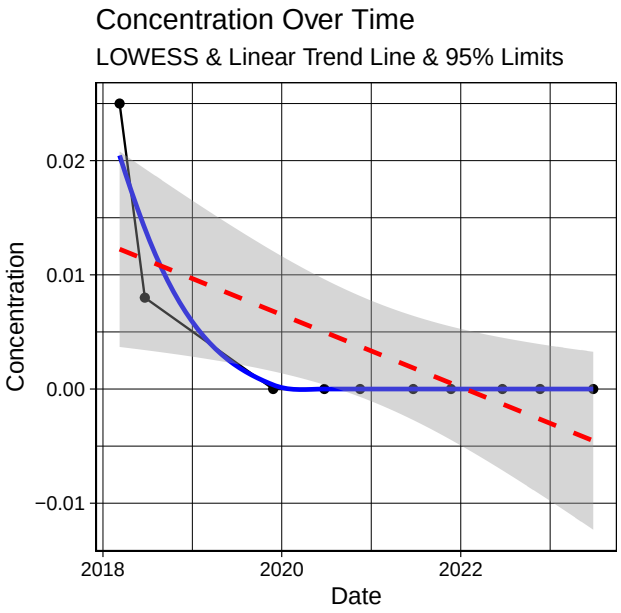
Report for ID : MW132 and Analyte : PFHxS+PFOS

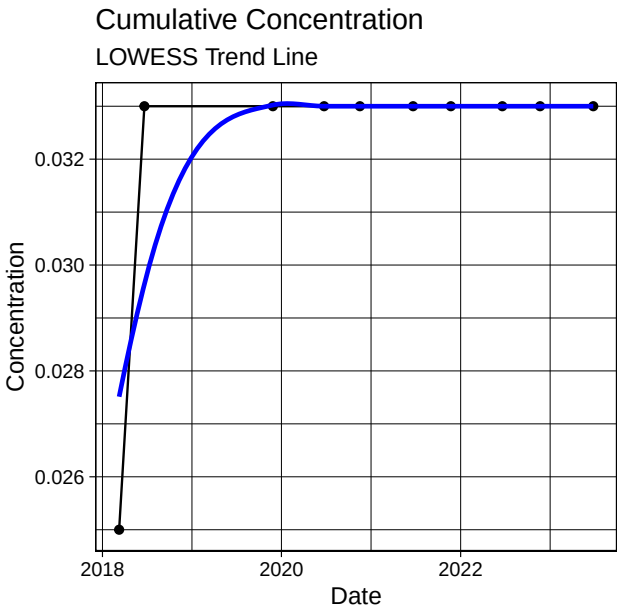




Kendall Trend Test Results Continuous	
n	10
z	-2.07
p	0.04
S	-17
varS	59.67
tau	-0.61
mean	0
sd	0.01
cov	2.43
results	DECREASING

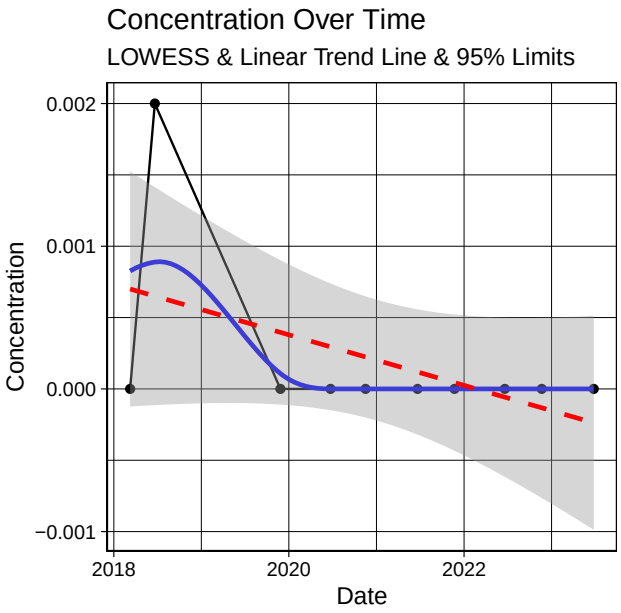
Report for ID : MW132 and Analyte : PFOA

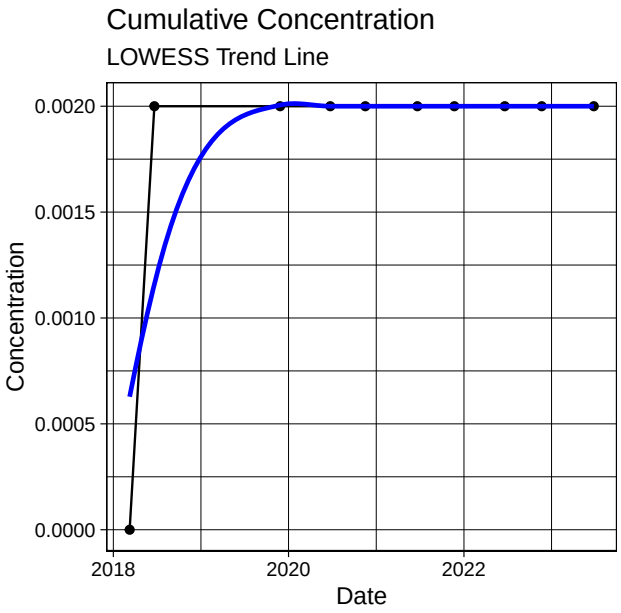




Kendall Trend Test Results Continuous	
n	10
z	-1.04
p	0.3
S	-7
varS	33
tau	-0.35
mean	0
sd	0
cov	3.16
results	NO CLEAR TREND

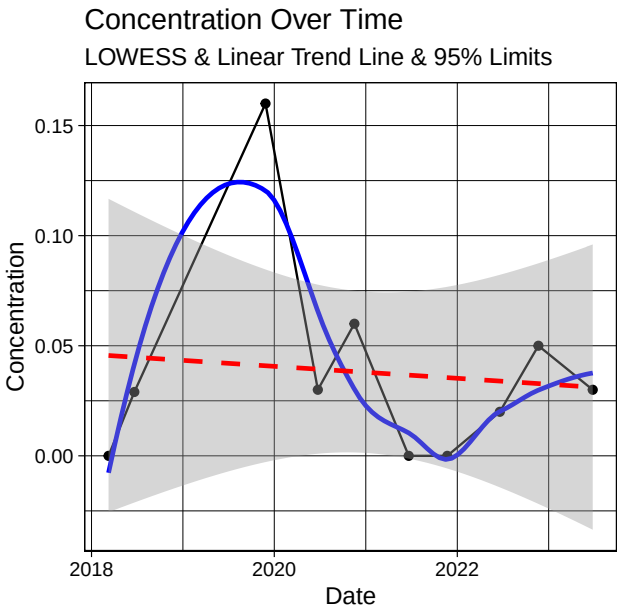
Report for ID : MW132 and Analyte : PFOS

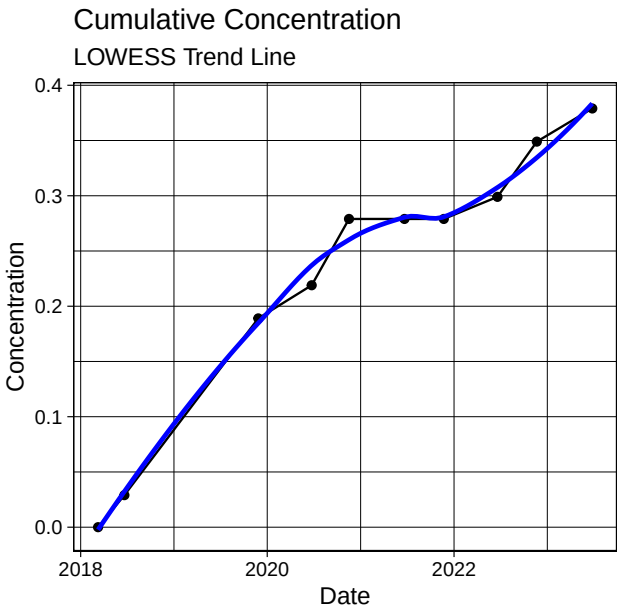




Kendall Trend Test Results Continuous	
n	10
z	0.18
p	0.86
S	3
varS	120.33
tau	0.07
mean	0.04
sd	0.05
cov	1.26
results	NO CLEAR TREND

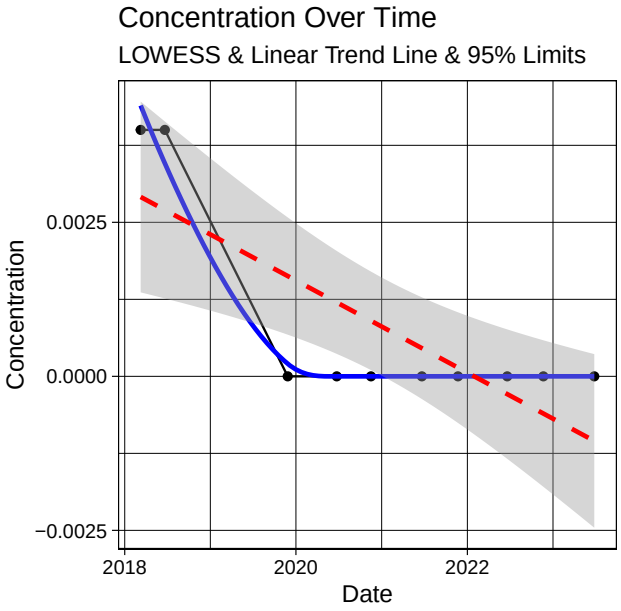
Report for ID : MW133 and Analyte : PFHxS+PFOS

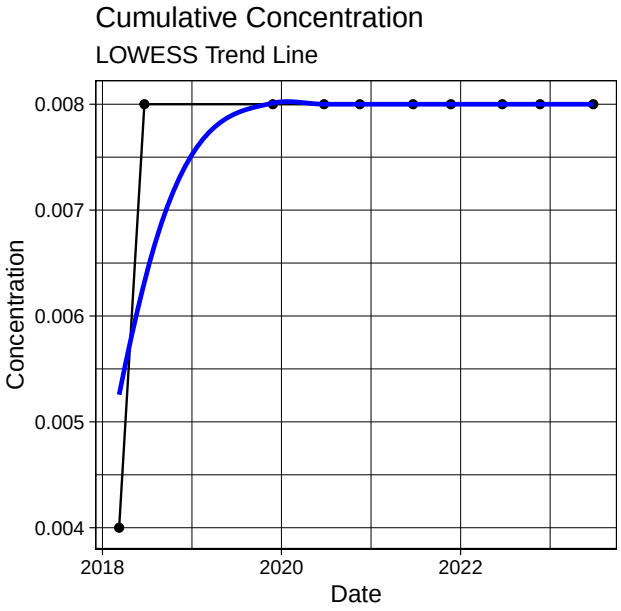




Kendall Trend Test Results Continuous	
n	10
z	-1.96
p	0.05
S	-16
varS	58.67
tau	-0.6
mean	0
sd	0
cov	2.11
results	POSSIBLY DECREASING

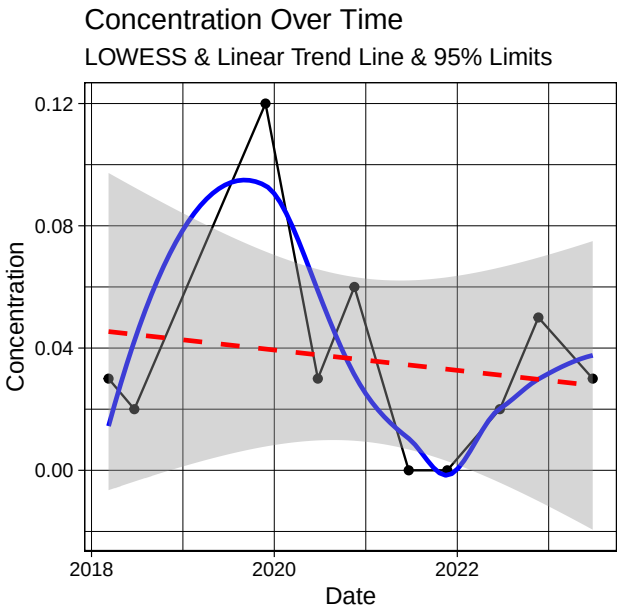
Report for ID : MW133 and Analyte : PFOA

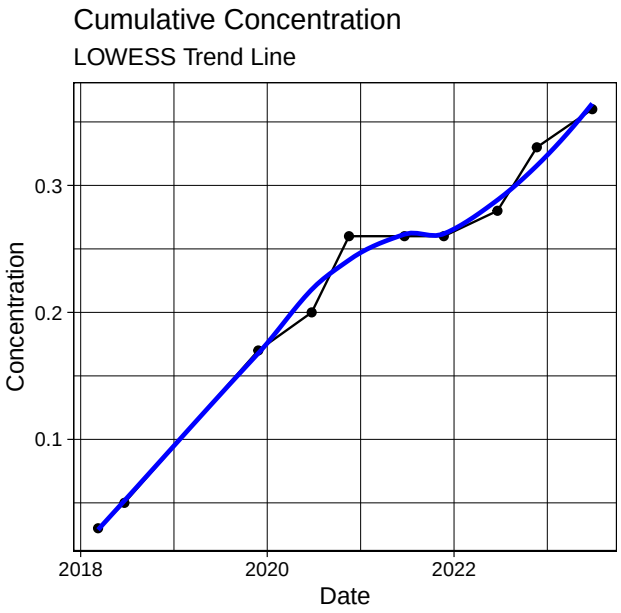




Kendall Trend Test Results Continuous	
n	10
z	-0.27
p	0.78
S	-4
varS	119.33
tau	-0.09
mean	0.04
sd	0.04
cov	0.97
results	STABLE

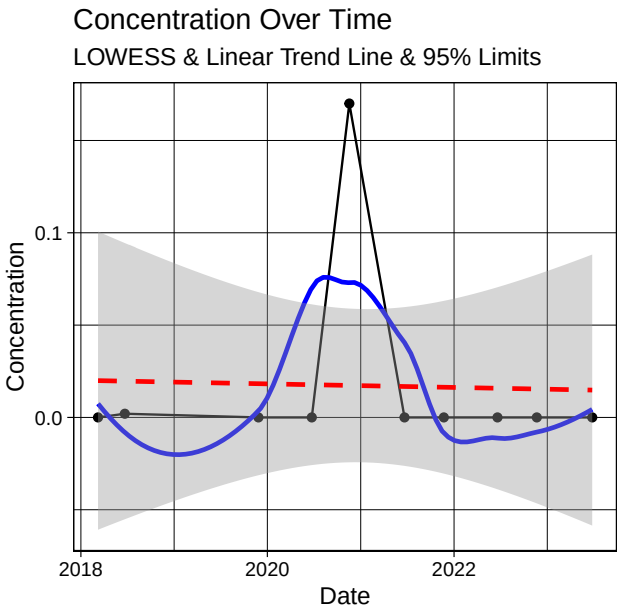
Report for ID : MW133 and Analyte : PFOS

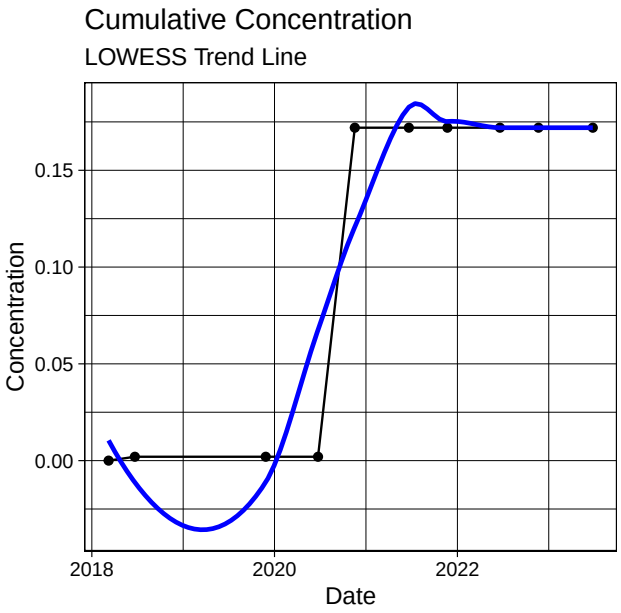




Kendall Trend Test Results Continuous	
n	10
z	-0.78
p	0.44
S	-7
varS	59.67
tau	-0.25
mean	0.02
sd	0.05
cov	3.12
results	NO CLEAR TREND

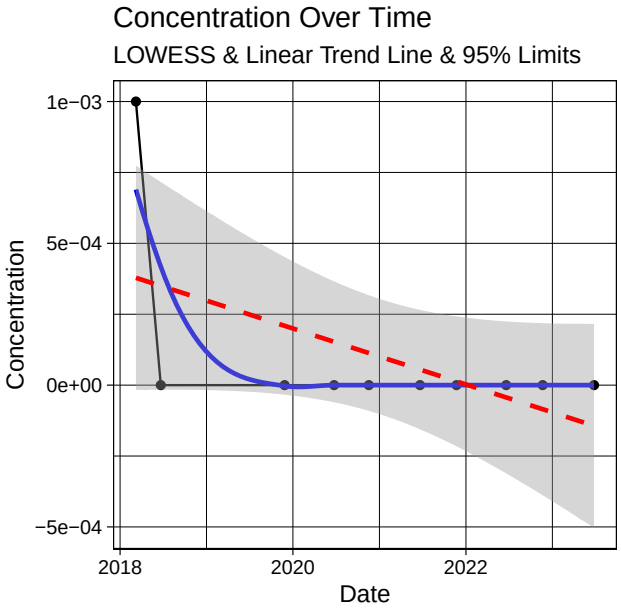
Report for ID : MW134 and Analyte : PFHxS+PFOS

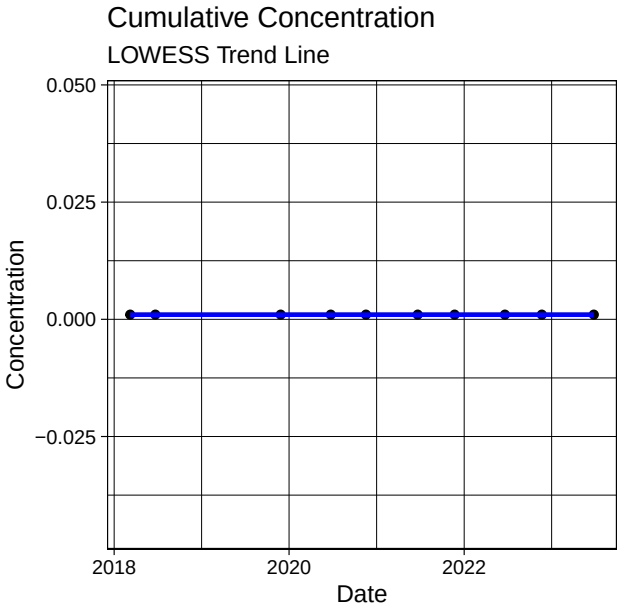




Kendall Trend Test Results Continuous	
n	10
z	-1.39
p	0.16
S	-9
varS	33
tau	-0.45
mean	0
sd	0
cov	3.16
results	NO CLEAR TREND

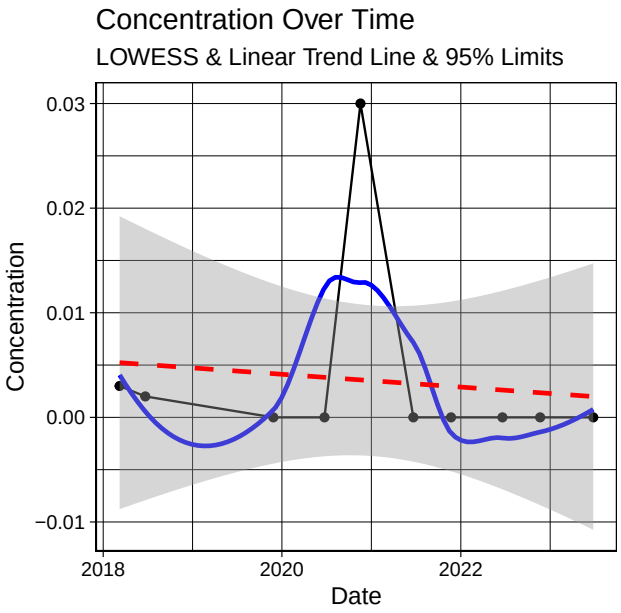
Report for ID : MW134 and Analyte : PFOA

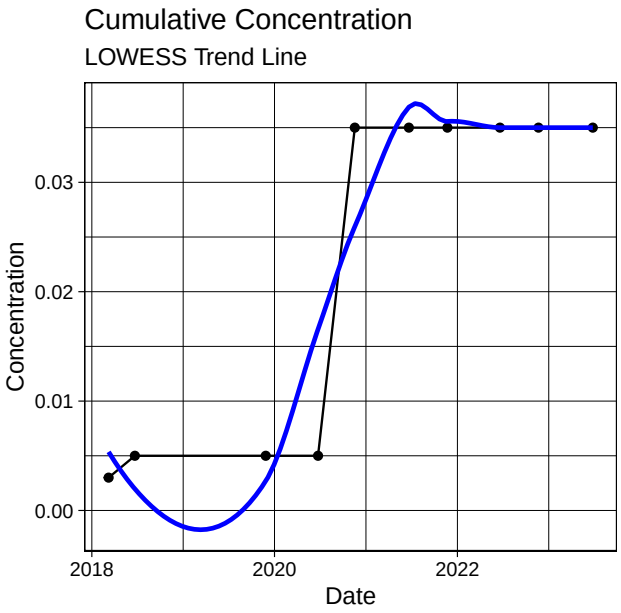




Kendall Trend Test Results Continuous	
n	10
z	-1.67
p	0.09
S	-16
varS	80.67
tau	-0.49
mean	0
sd	0.01
cov	2.68
results	POSSIBLY DECREASING

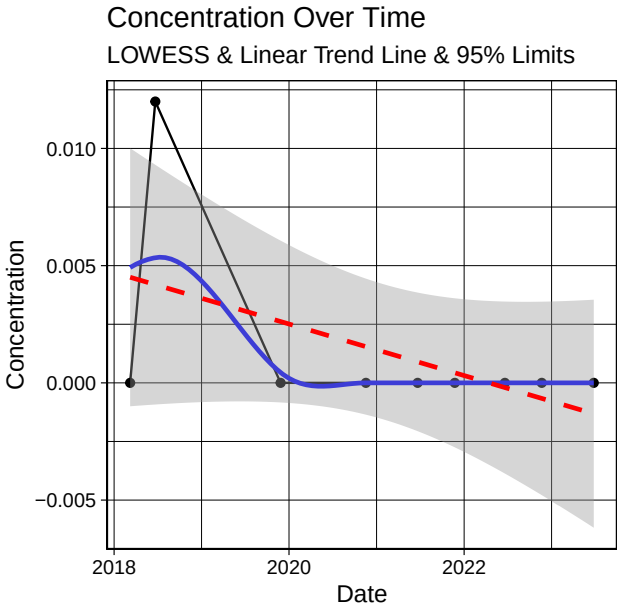
Report for ID : MW134 and Analyte : PFOS

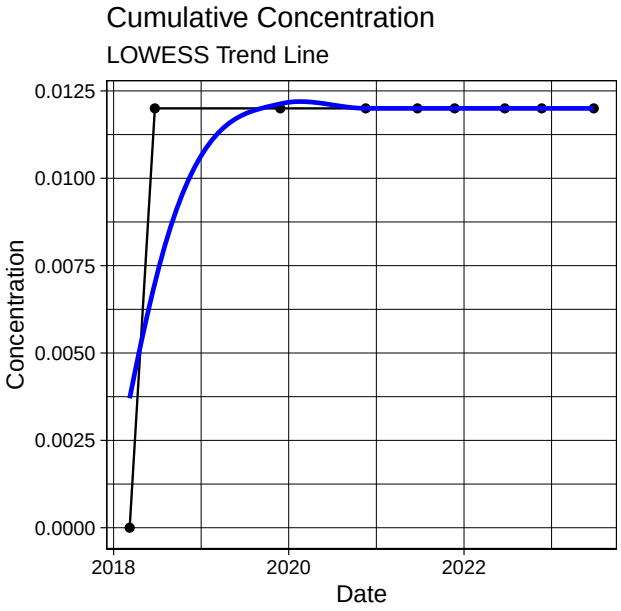




Kendall Trend Test Results Continuous	
n	9
z	-0.97
p	0.33
S	-6
varS	26.67
tau	-0.35
mean	0
sd	0
cov	3
results	NO CLEAR TREND

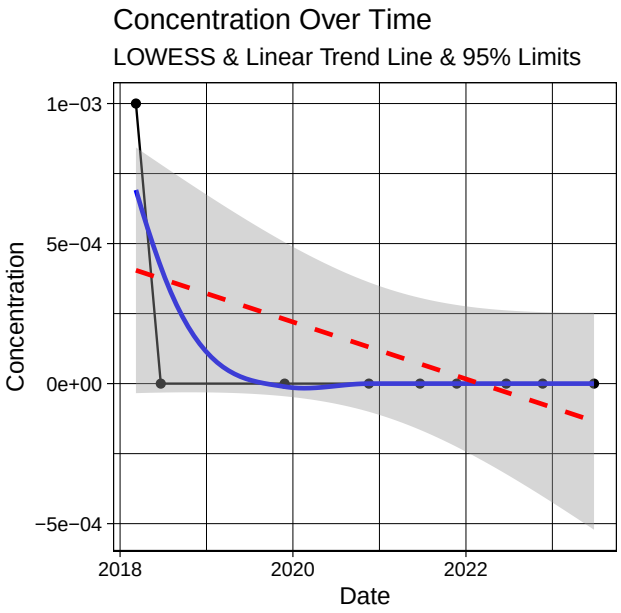
Report for ID : MW135 and Analyte : PFHxS+PFOS

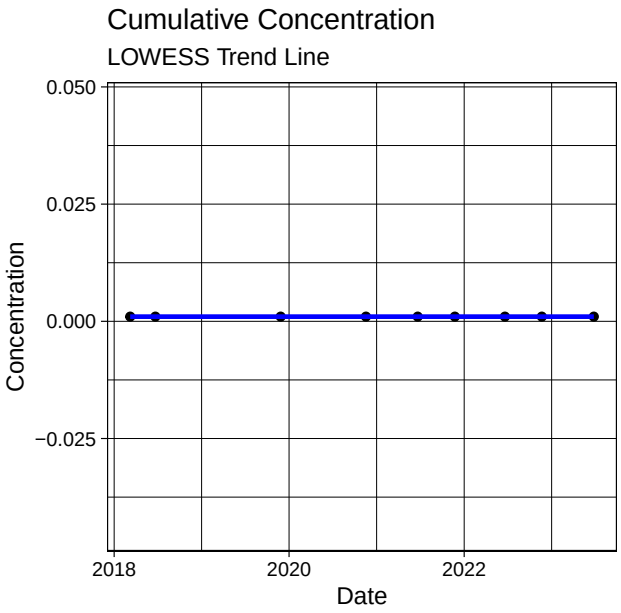




Kendall Trend Test Results Continuous	
n	9
z	-1.36
p	0.18
S	-8
varS	26.67
tau	-0.47
mean	0
sd	0
cov	3
results	NO CLEAR TREND

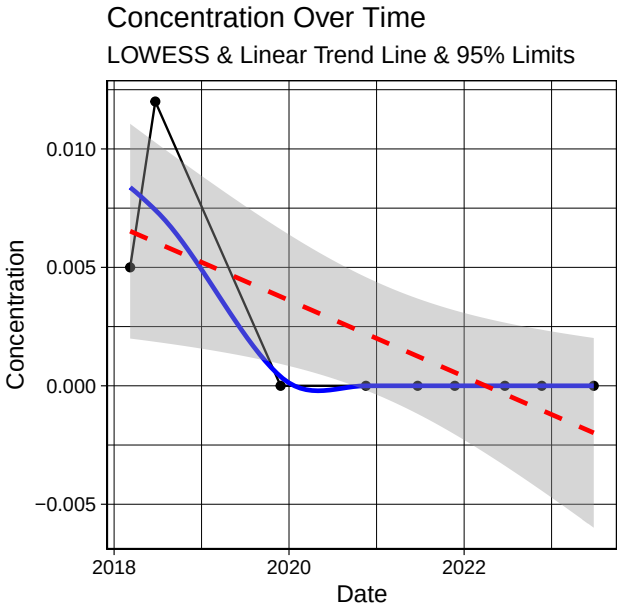
Report for ID : MW135 and Analyte : PFOA

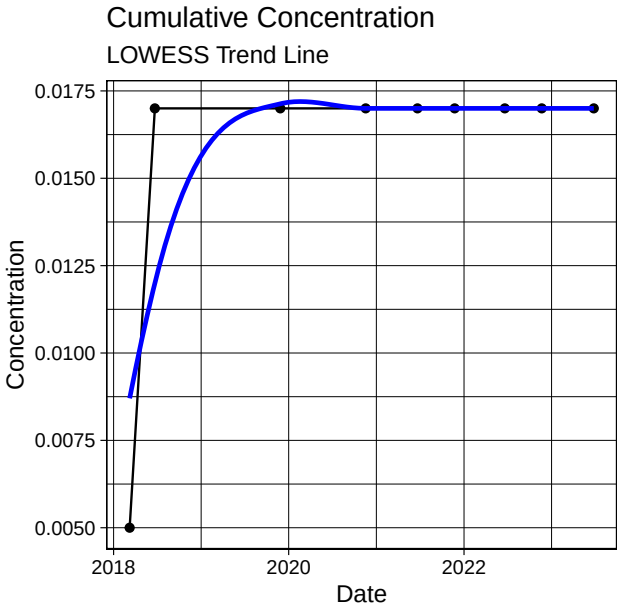




Kendall Trend Test Results Continuous	
n	9
z	-1.74
p	0.08
S	-13
varS	47.67
tau	-0.56
mean	0
sd	0
cov	2.19
results	POSSIBLY DECREASING

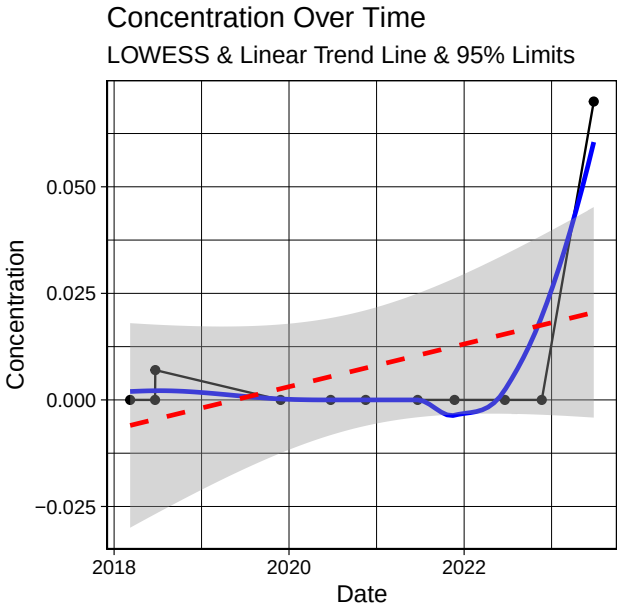
Report for ID : MW135 and Analyte : PFOS

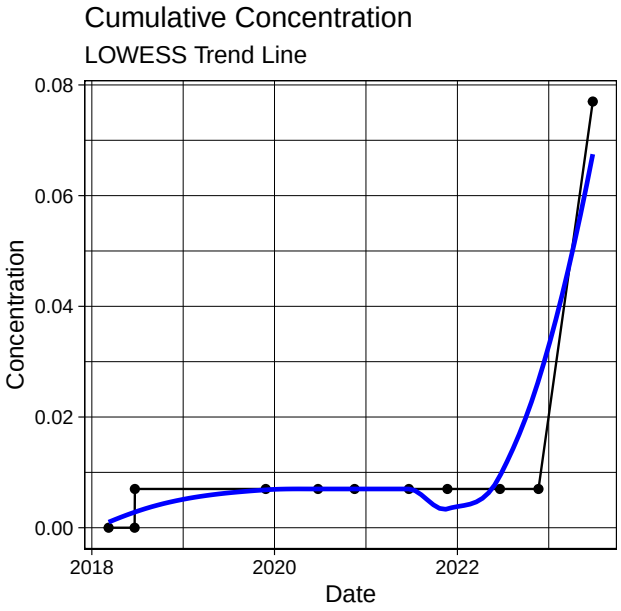




Kendall Trend Test Results Continuous	
n	11
z	0.47
p	0.64
S	5
varS	73
tau	0.15
mean	0.01
sd	0.02
cov	3
results	NO CLEAR TREND

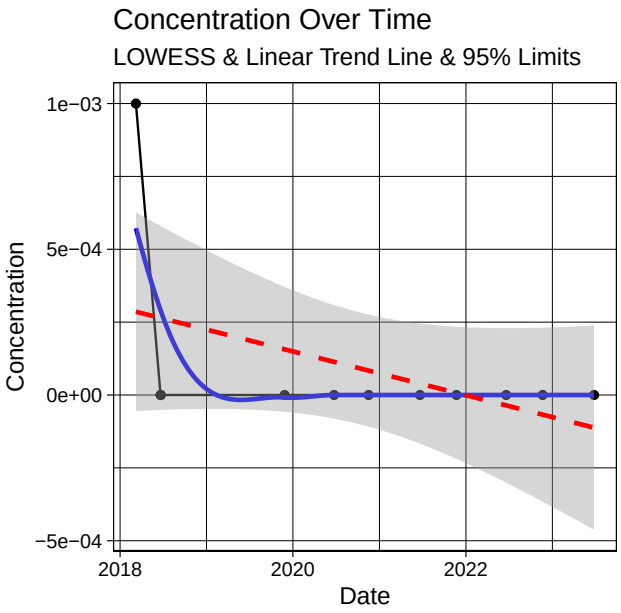
Report for ID : MW137 and Analyte : PFHxS+PFOS

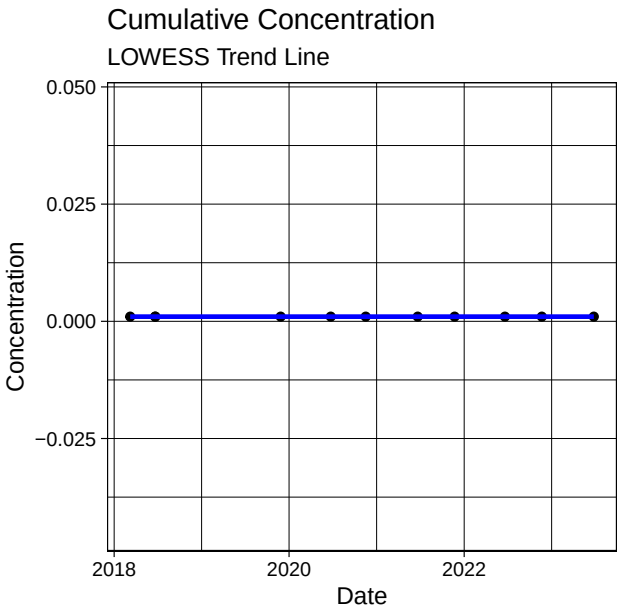




Kendall Trend Test Results Continuous	
n	11
z	-1.42
p	0.15
S	-10
varS	40
tau	-0.43
mean	0
sd	0
cov	3.32
results	NO CLEAR TREND

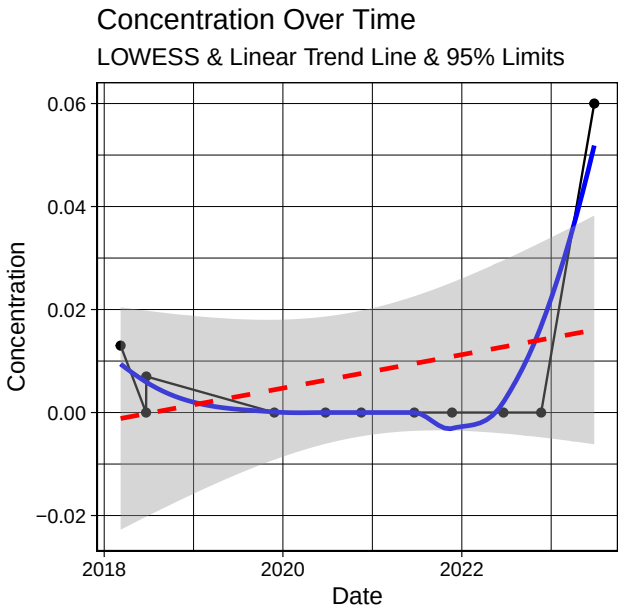
Report for ID : MW137 and Analyte : PFOA

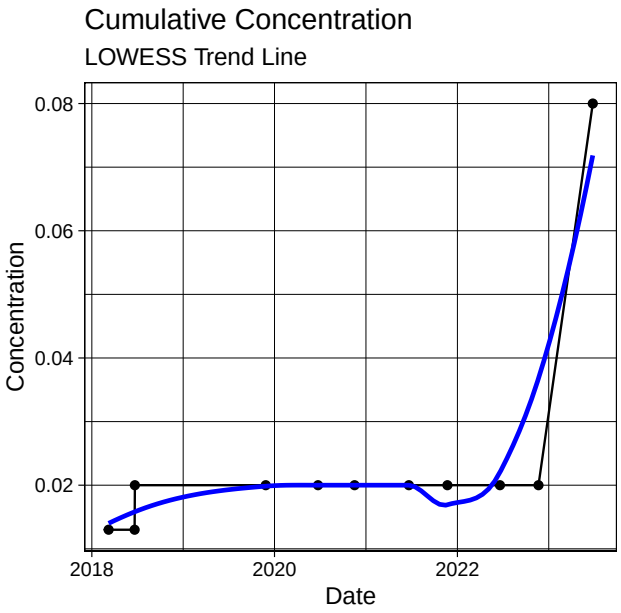




Kendall Trend Test Results Continuous	
n	11
z	-0.4
p	0.69
S	-5
varS	99.67
tau	-0.13
mean	0.01
sd	0.02
cov	2.47
results	NO CLEAR TREND

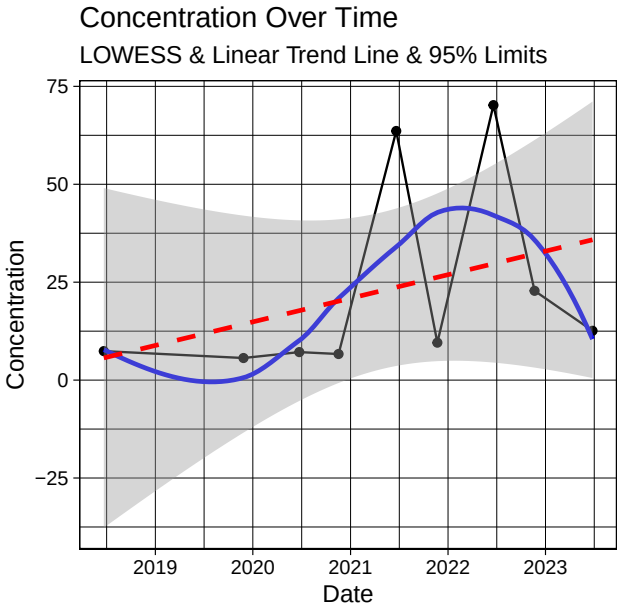
Report for ID : MW137 and Analyte : PFOS

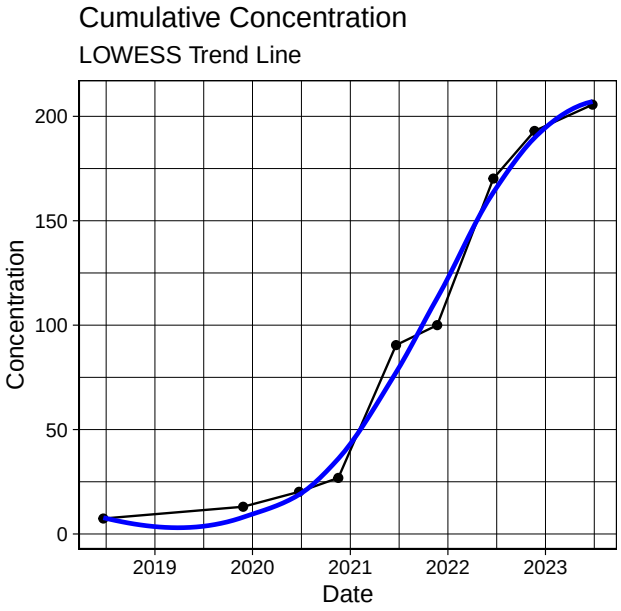




Kendall Trend Test Results Continuous	
n	9
z	1.56
p	0.12
S	16
varS	92
tau	0.44
mean	22.84
sd	25.56
cov	1.12
results	NO CLEAR TREND

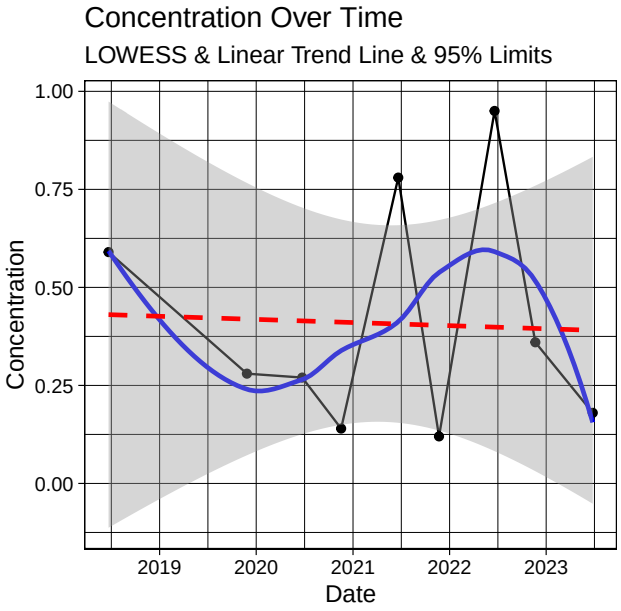
Report for ID : MW142 and Analyte : PFHxS+PFOS

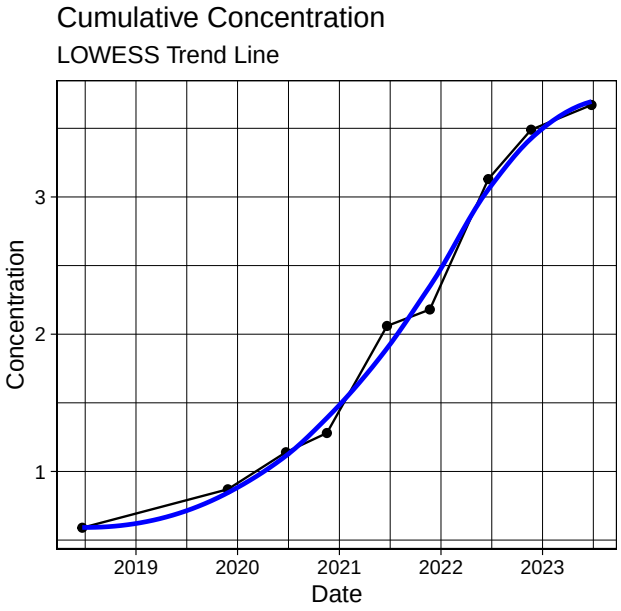




Kendall Trend Test Results Continuous	
n	9
z	-0.31
p	0.75
S	-4
varS	92
tau	-0.11
mean	0.41
sd	0.3
cov	0.73
results	STABLE

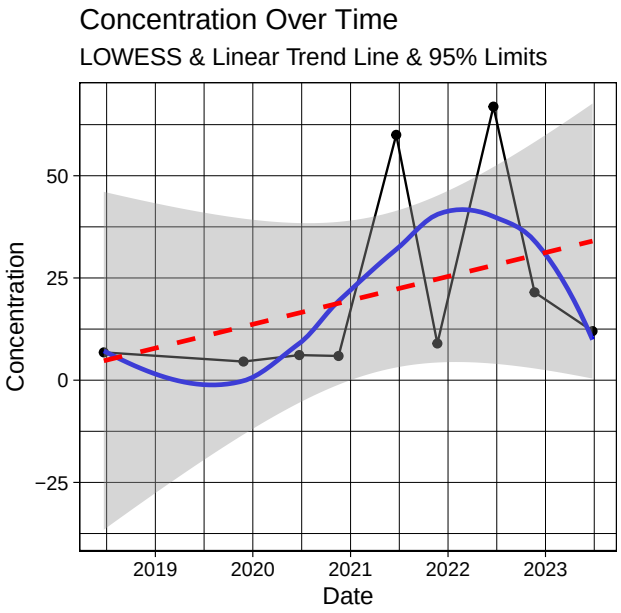
Report for ID : MW142 and Analyte : PFOA

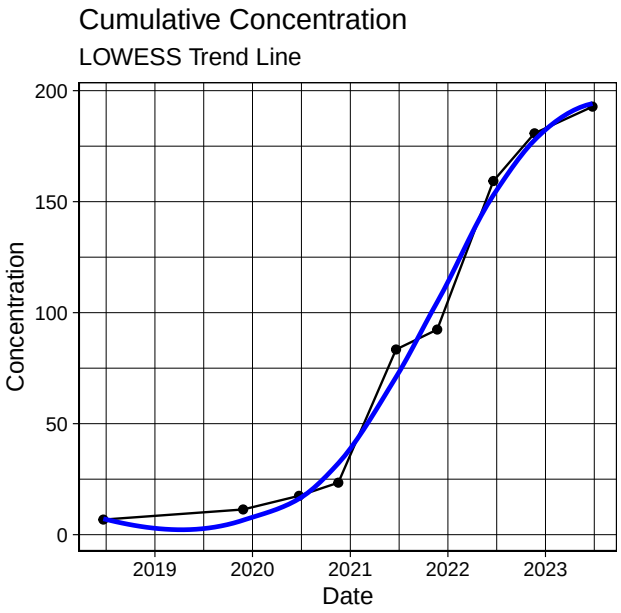




Kendall Trend Test Results Continuous	
n	9
z	1.56
p	0.12
S	16
varS	92
tau	0.44
mean	21.42
sd	24.42
cov	1.14
results	NO CLEAR TREND

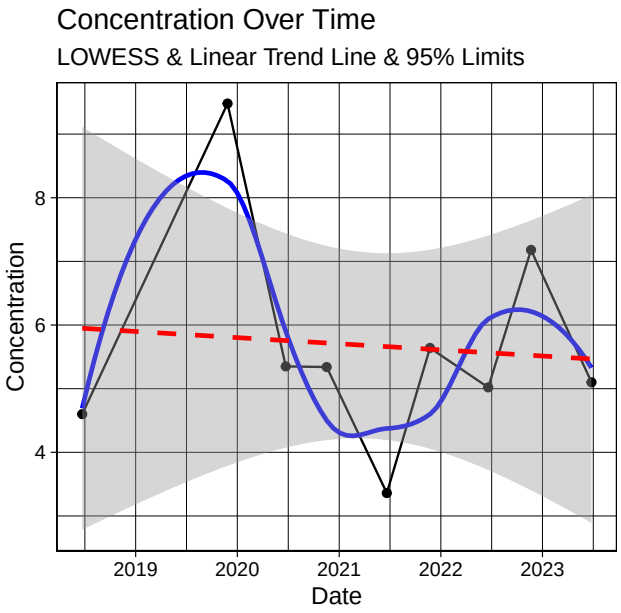
Report for ID : MW142 and Analyte : PFOS

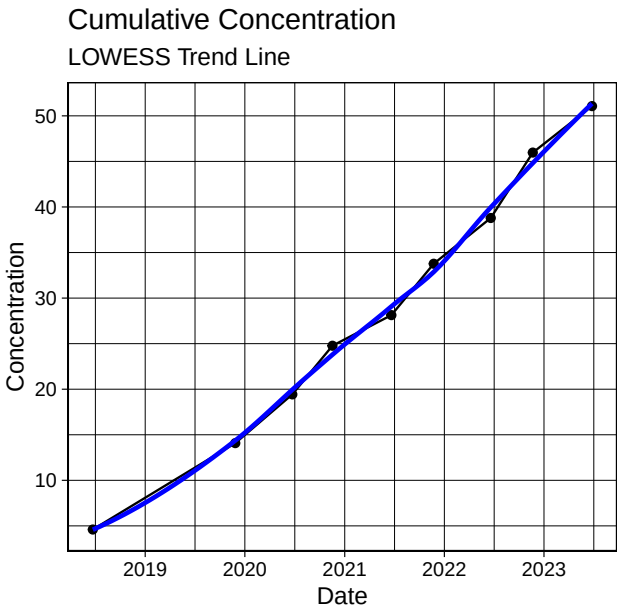




Kendall Trend Test Results Continuous	
n	9
z	0
p	1
S	0
varS	92
tau	0
mean	5.67
sd	1.74
cov	0.31
results	STABLE

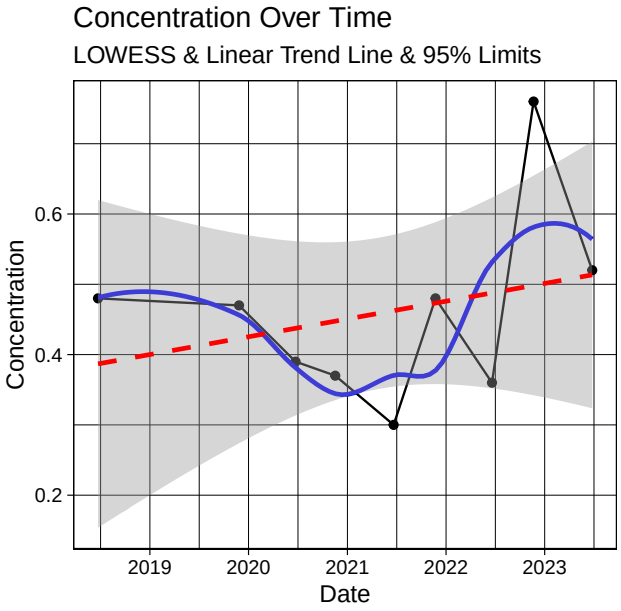
Report for ID : MW143 and Analyte : PFHxS+PFOS

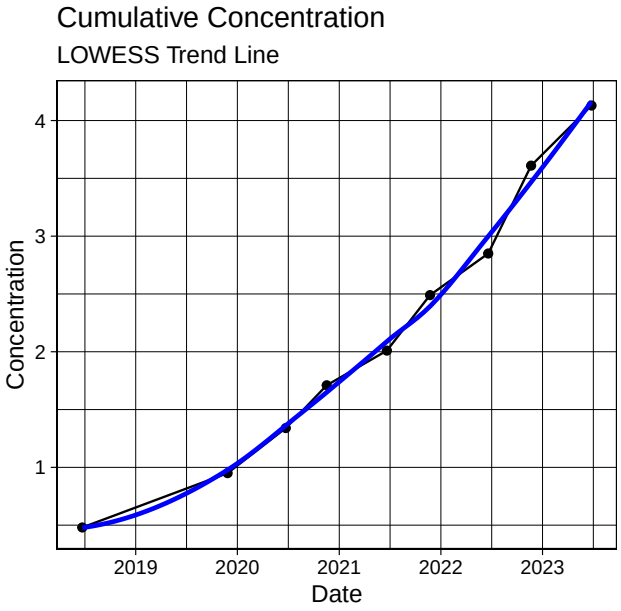




Kendall Trend Test Results Continuous	
n	9
z	0.21
p	0.83
S	3
varS	91
tau	0.08
mean	0.46
sd	0.13
cov	0.29
results	NO CLEAR TREND

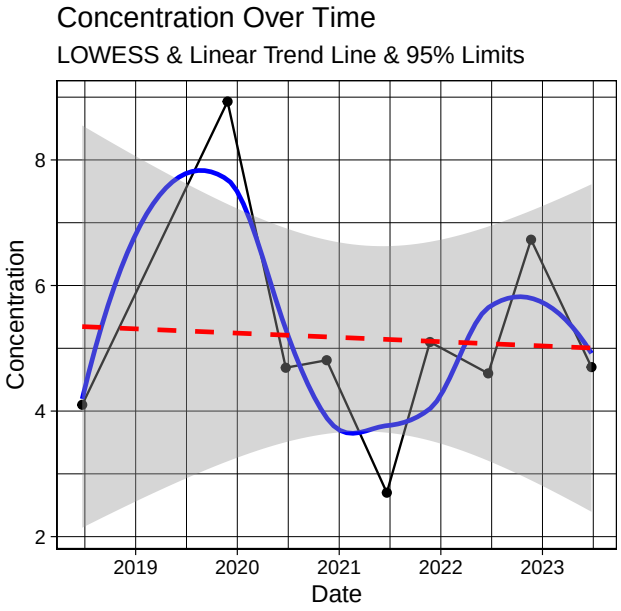
Report for ID : MW143 and Analyte : PFOA

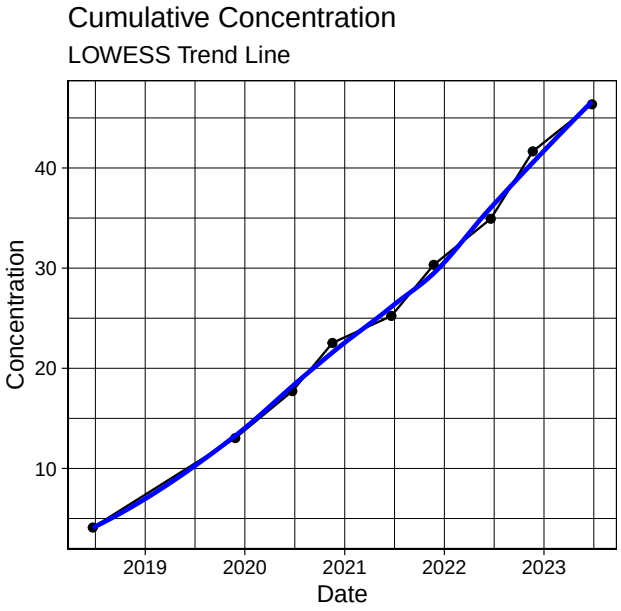




Kendall Trend Test Results Continuous	
n	9
z	0.31
p	0.75
S	4
varS	92
tau	0.11
mean	5.15
sd	1.76
cov	0.34
results	NO CLEAR TREND

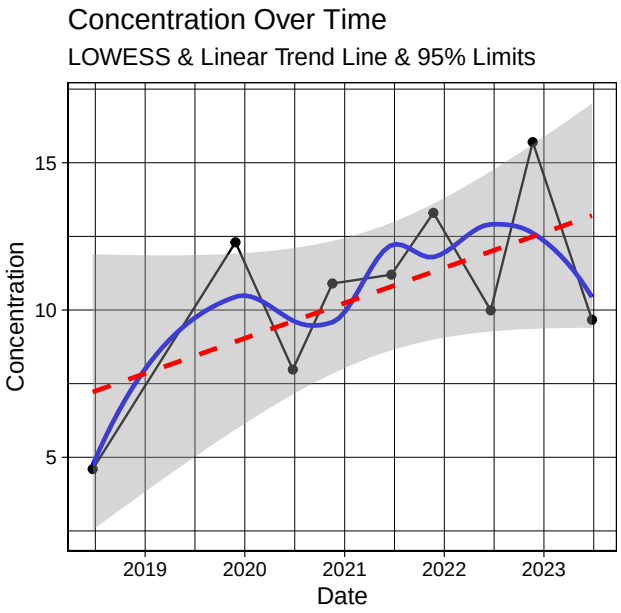
Report for ID : MW143 and Analyte : PFOS

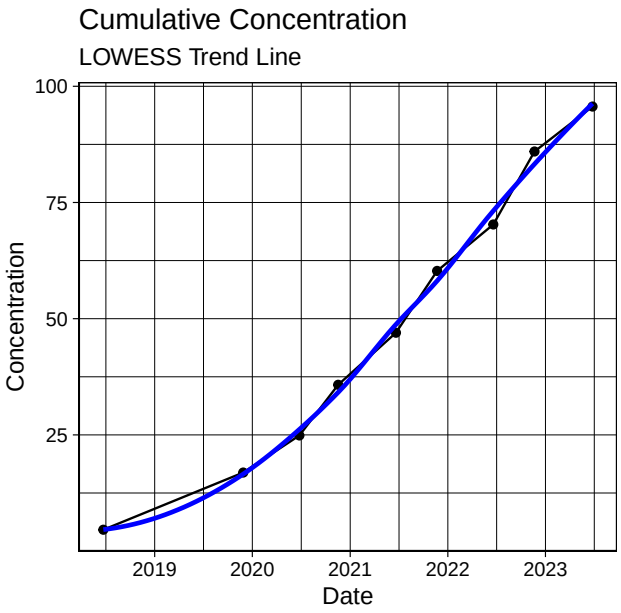




Kendall Trend Test Results Continuous	
n	9
z	0.94
p	0.35
S	10
varS	92
tau	0.28
mean	10.63
sd	3.18
cov	0.3
results	NO CLEAR TREND

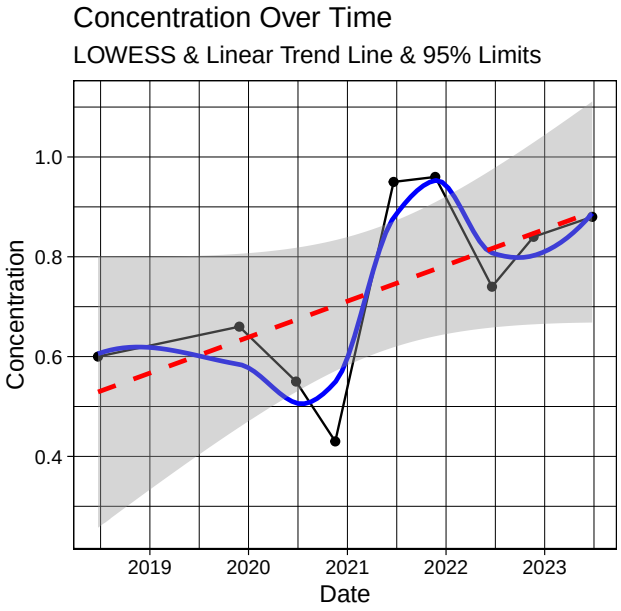
Report for ID : MW144S and Analyte : PFHxS+PFOS

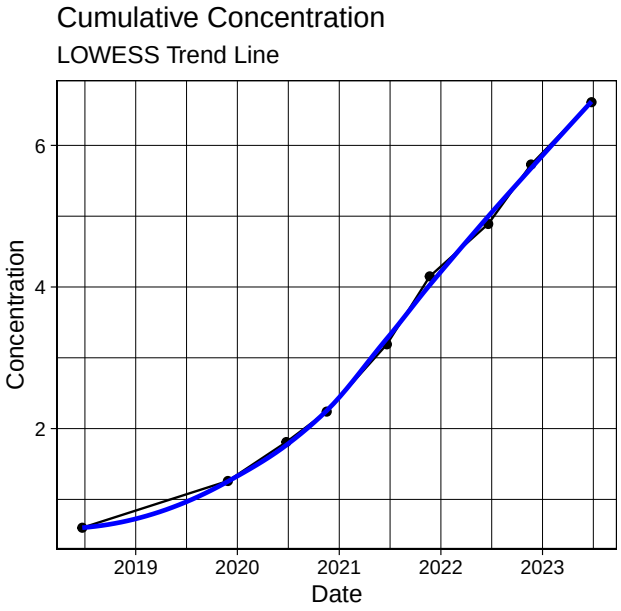




Kendall Trend Test Results Continuous	
n	9
z	1.36
p	0.18
S	14
varS	92
tau	0.39
mean	0.73
sd	0.19
cov	0.25
results	NO CLEAR TREND

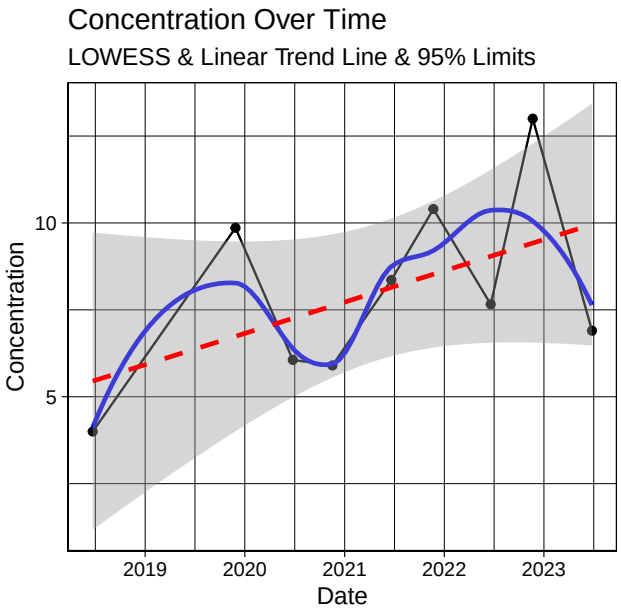
Report for ID : MW144S and Analyte : PFOA

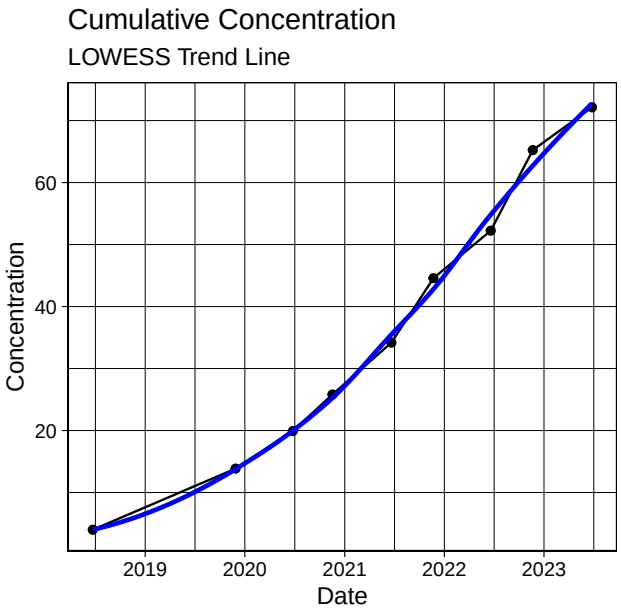




Kendall Trend Test Results Continuous	
n	9
z	1.15
p	0.25
S	12
varS	92
tau	0.33
mean	8.02
sd	2.74
cov	0.34
results	NO CLEAR TREND

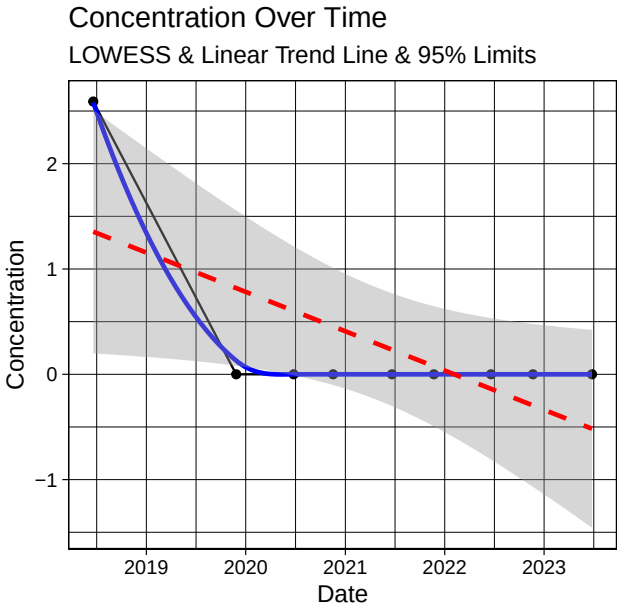
Report for ID : MW144S and Analyte : PFOS

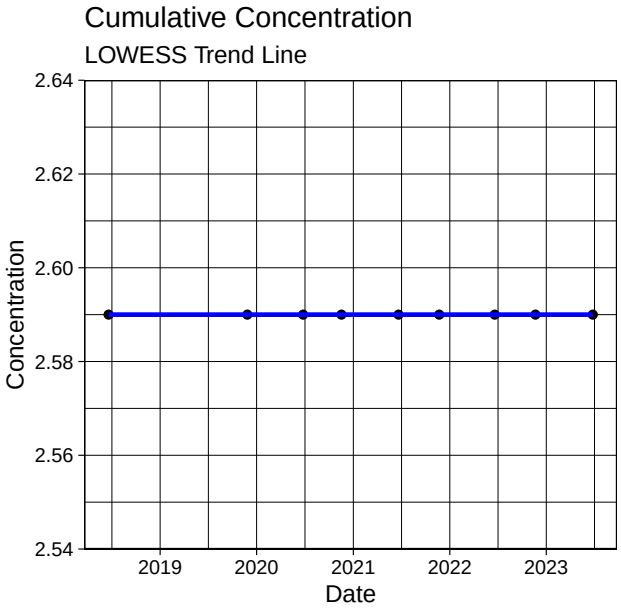




Kendall Trend Test Results Continuous	
n	9
z	-1.36
p	0.18
S	-8
varS	26.67
tau	-0.47
mean	0.29
sd	0.86
cov	3
results	NO CLEAR TREND

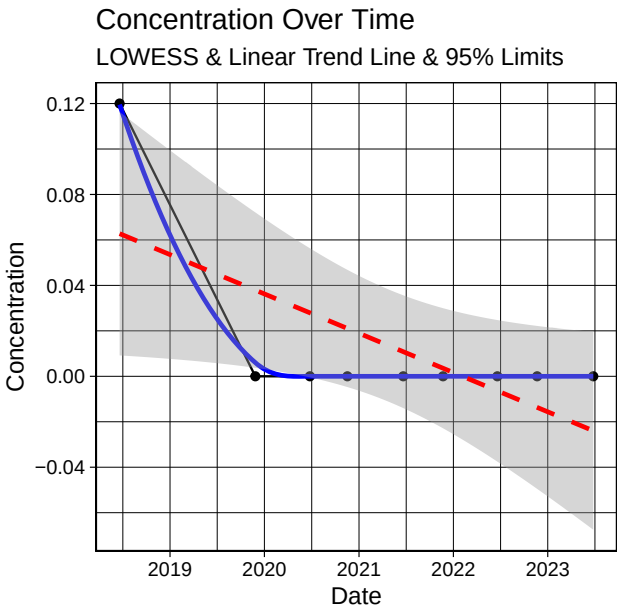
Report for ID : MW145 and Analyte : PFHxS+PFOS

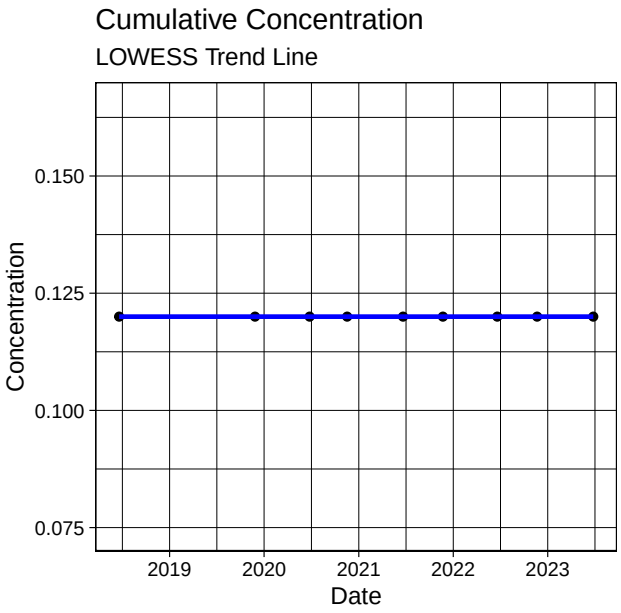




Kendall Trend Test Results Continuous	
n	9
z	-1.36
p	0.18
S	-8
varS	26.67
tau	-0.47
mean	0.01
sd	0.04
cov	3
results	NO CLEAR TREND

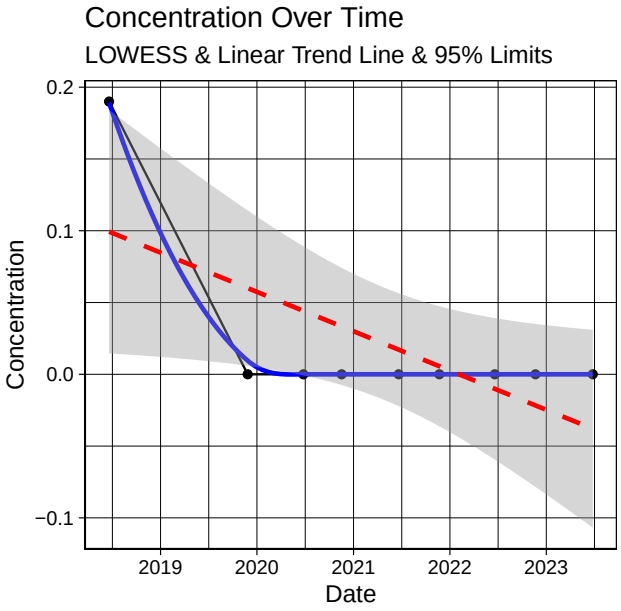
Report for ID : MW145 and Analyte : PFOA

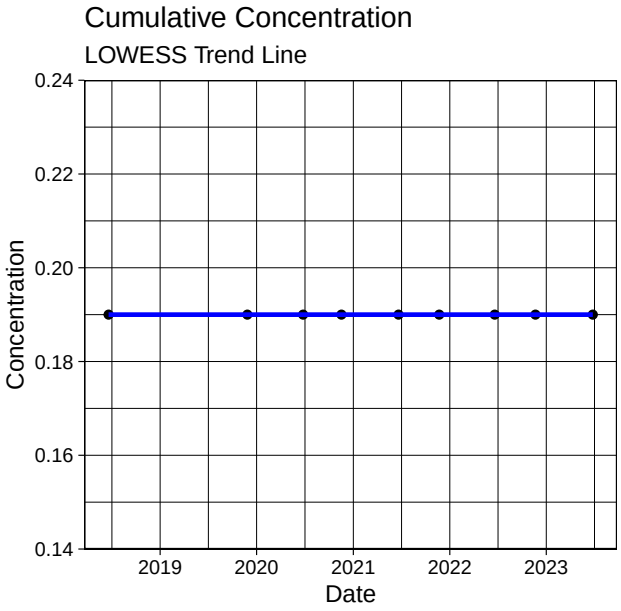




Kendall Trend Test Results Continuous	
n	9
z	-1.36
p	0.18
S	-8
varS	26.67
tau	-0.47
mean	0.02
sd	0.06
cov	3
results	NO CLEAR TREND

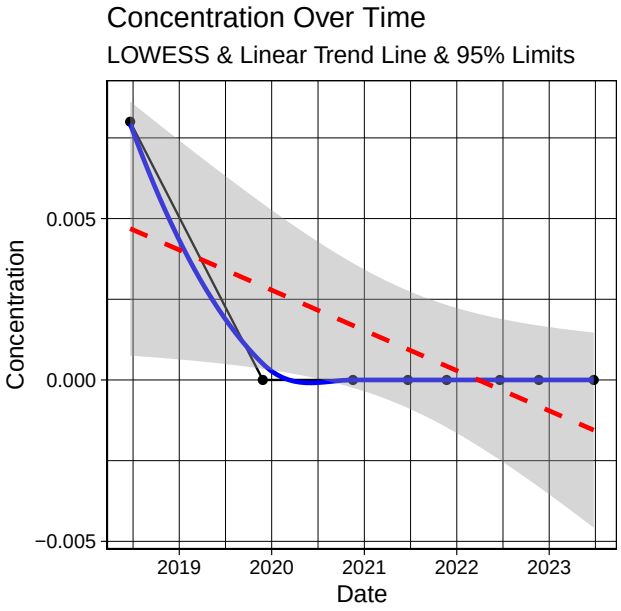
Report for ID : MW145 and Analyte : PFOS

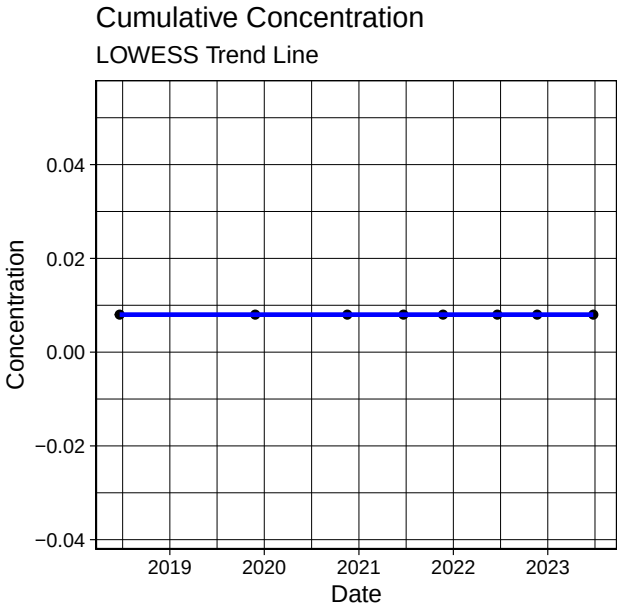




Kendall Trend Test Results Continuous	
n	8
z	-1.31
p	0.19
S	-7
varS	21
tau	-0.5
mean	0
sd	0
cov	2.83
results	NO CLEAR TREND

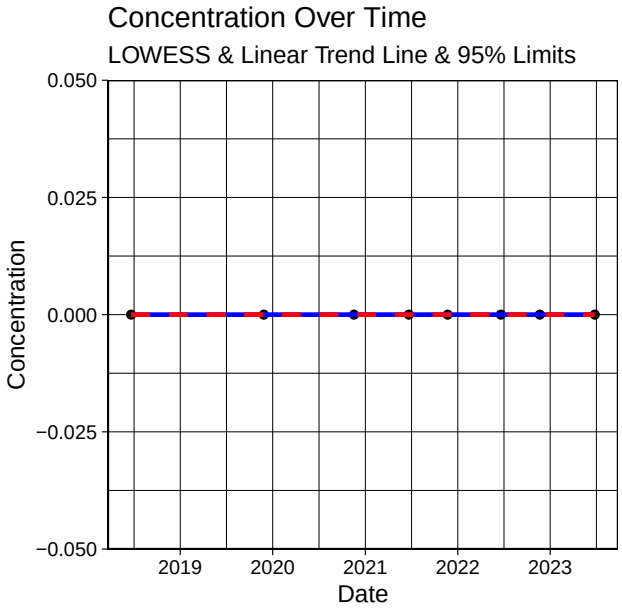
Report for ID : MW147 and Analyte : PFHxS+PFOS

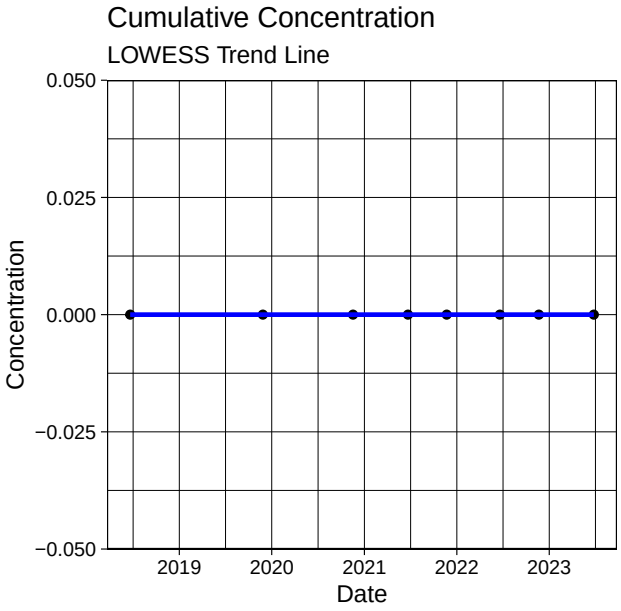




Kendall Trend Test Results Continuous	
n	8
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

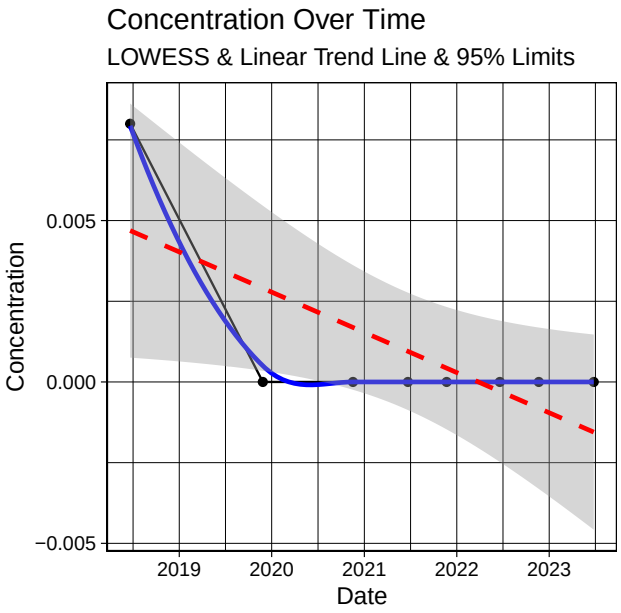
Report for ID : MW147 and Analyte : PFOA

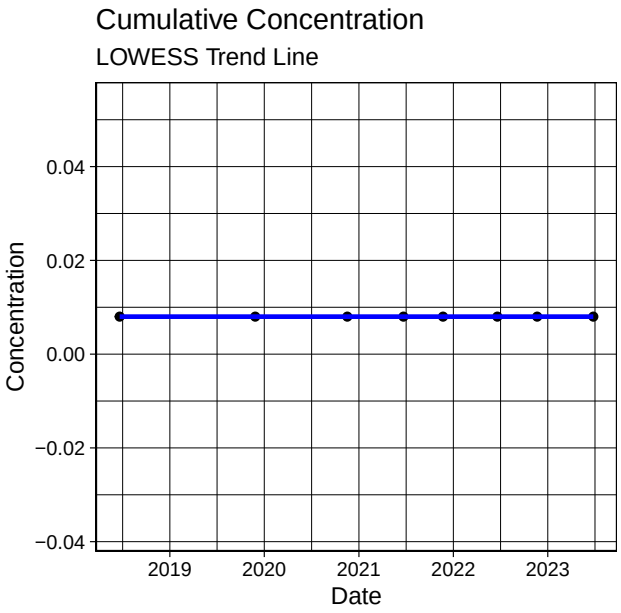




Kendall Trend Test Results Continuous	
n	8
z	-1.31
p	0.19
S	-7
varS	21
tau	-0.5
mean	0
sd	0
cov	2.83
results	NO CLEAR TREND

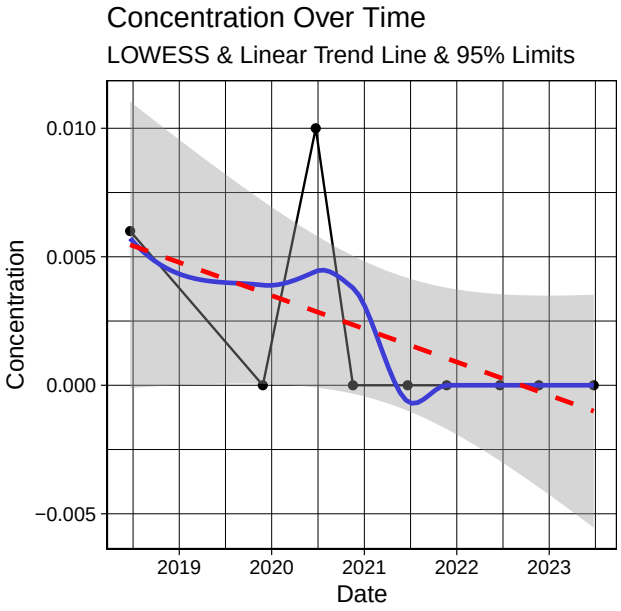
Report for ID : MW147 and Analyte : PFOS

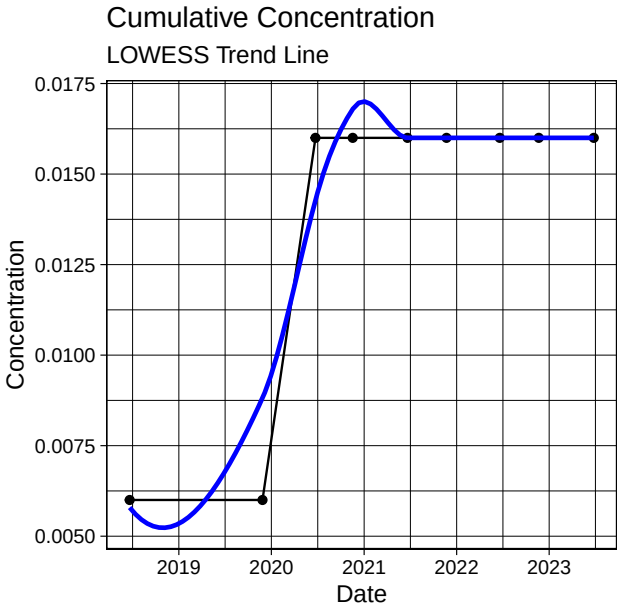




Kendall Trend Test Results Continuous	
n	9
z	-1.45
p	0.15
S	-11
varS	47.67
tau	-0.47
mean	0
sd	0
cov	2.06
results	NO CLEAR TREND

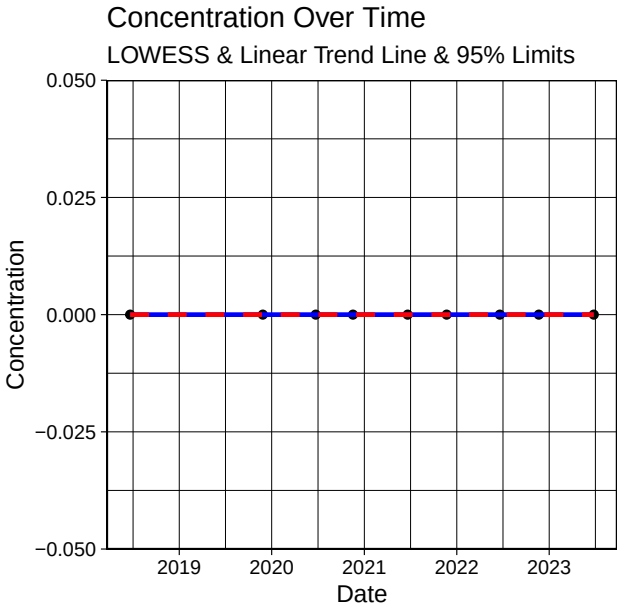
Report for ID : MW148S and Analyte : PFHxS+PFOS

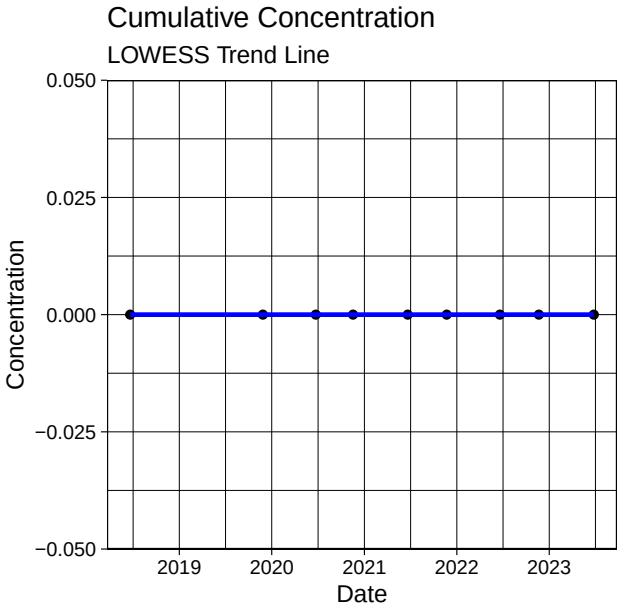




Kendall Trend Test Results Continuous	
n	9
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

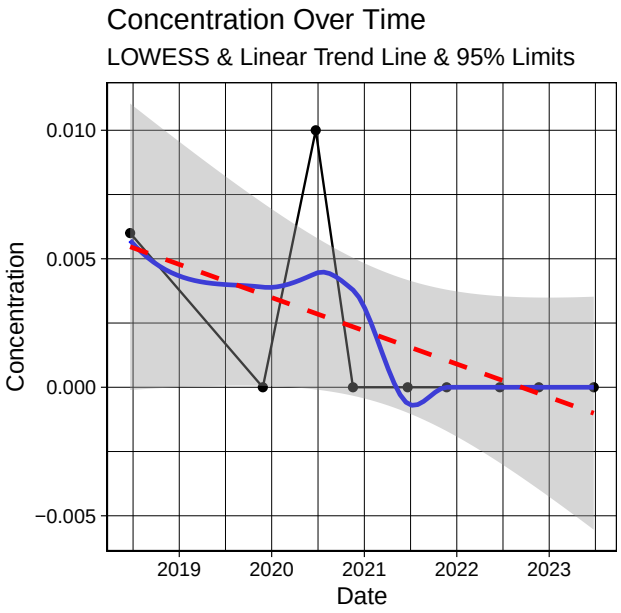
Report for ID : MW148S and Analyte : PFOA

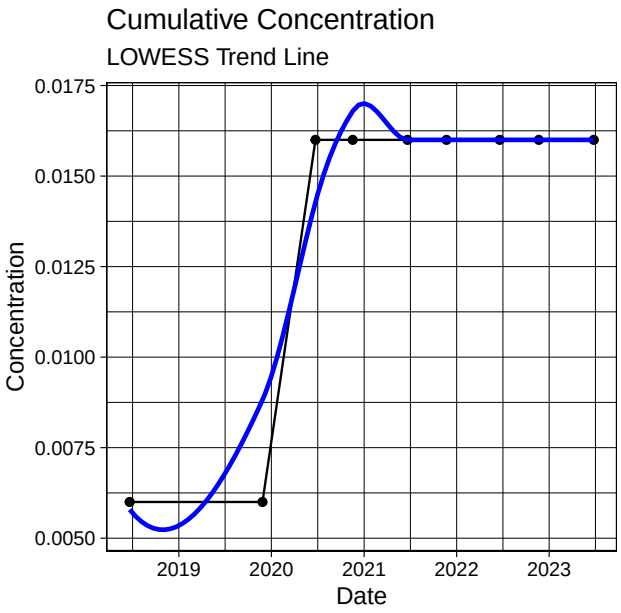




Kendall Trend Test Results Continuous	
n	9
z	-1.45
p	0.15
S	-11
varS	47.67
tau	-0.47
mean	0
sd	0
cov	2.06
results	NO CLEAR TREND

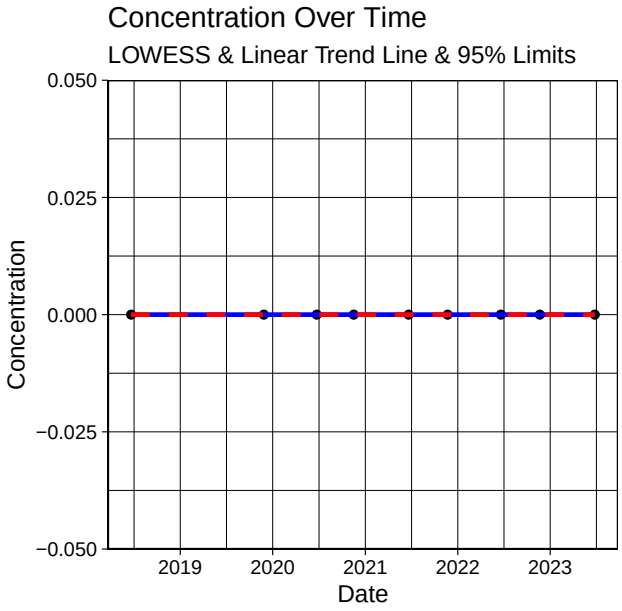
Report for ID : MW148S and Analyte : PFOS

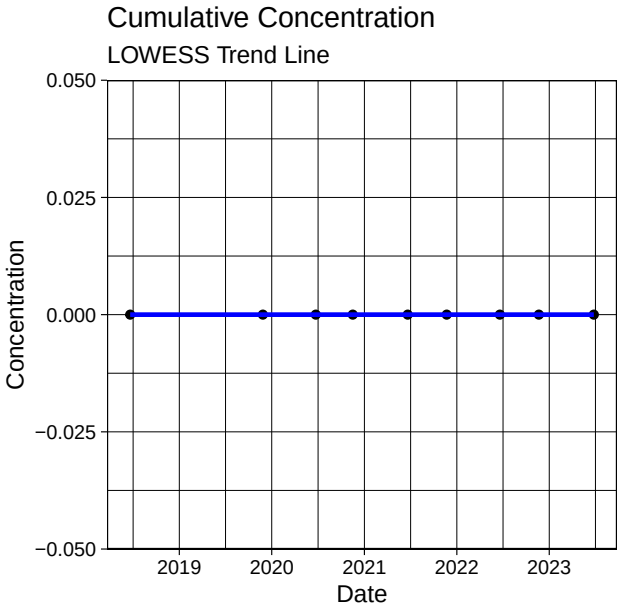




Kendall Trend Test Results Continuous	
n	9
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

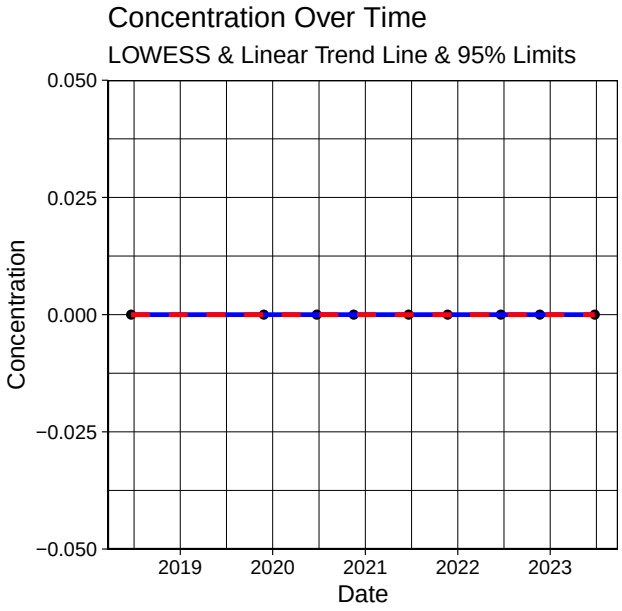
Report for ID : MW151S and Analyte : PFHxS+PFOS

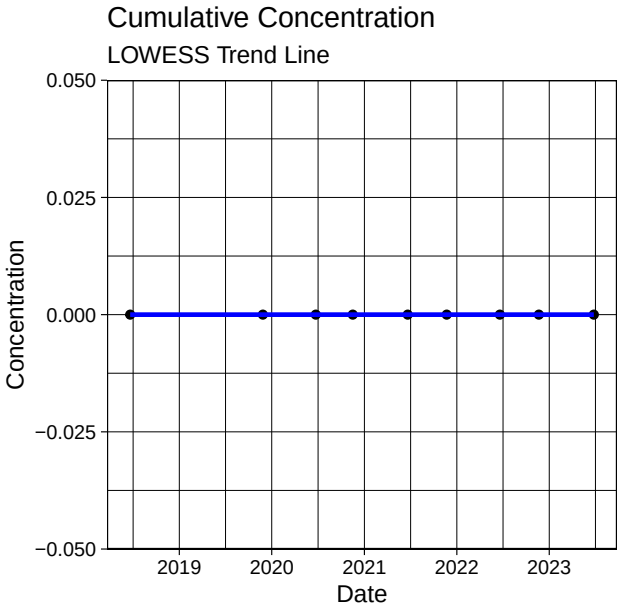




Kendall Trend Test Results Continuous	
n	9
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

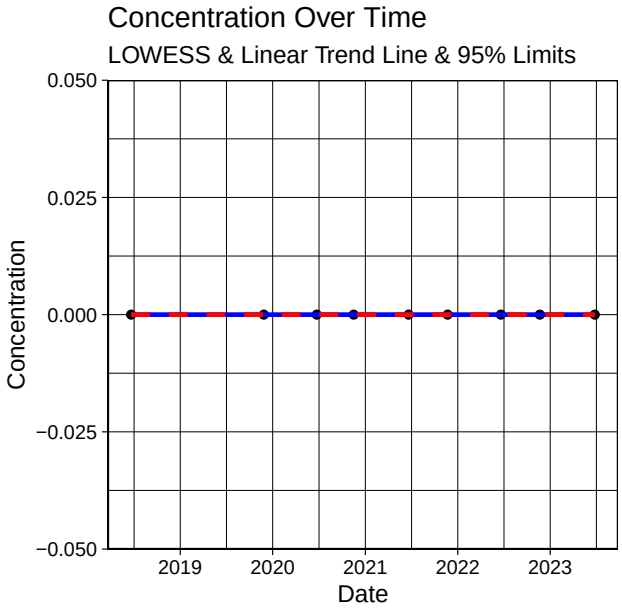
Report for ID : MW151S and Analyte : PFOA

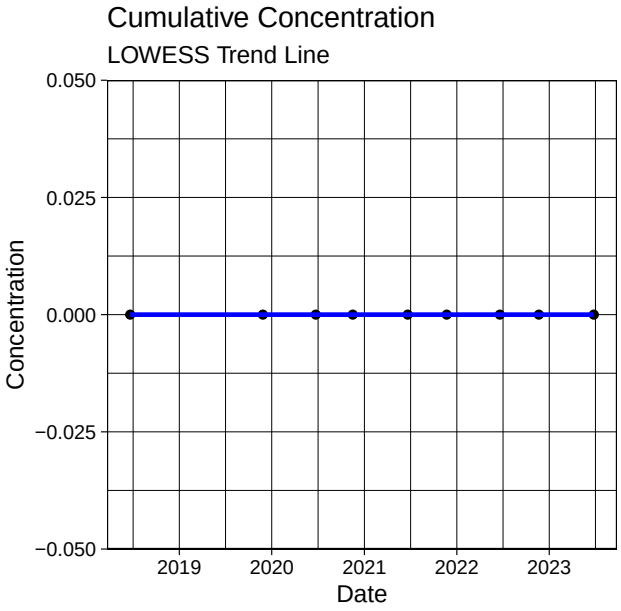




Kendall Trend Test Results Continuous	
n	9
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

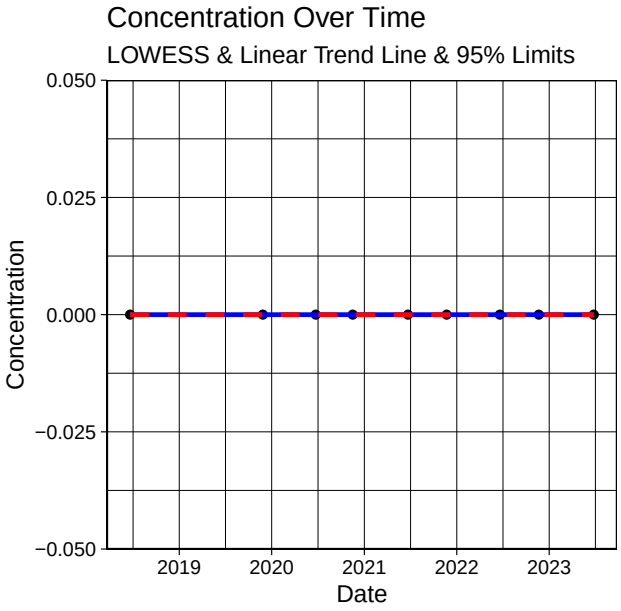
Report for ID : MW151S and Analyte : PFOS

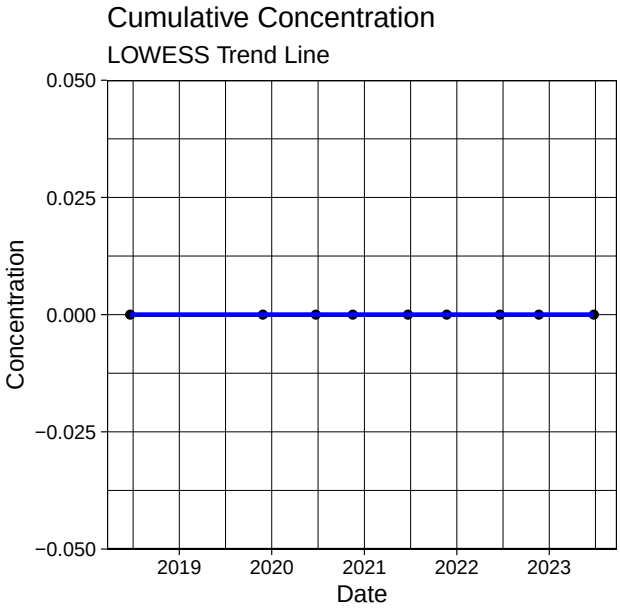




Kendall Trend Test Results Continuous	
n	9
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

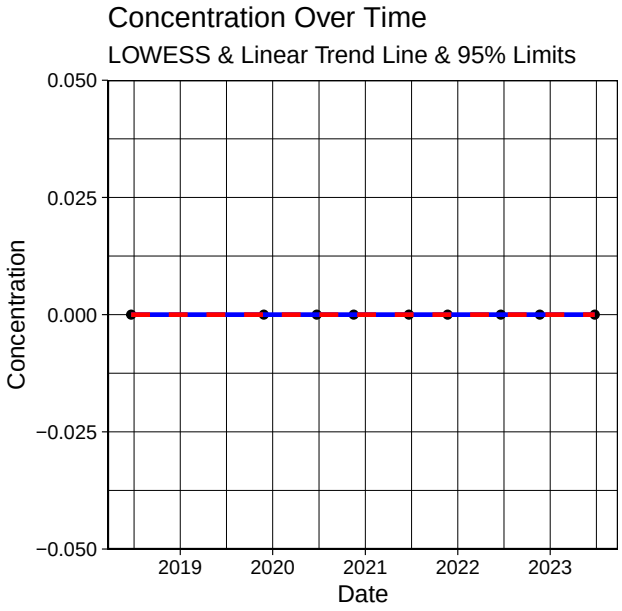
Report for ID : MW152S and Analyte : PFHxS+PFOS

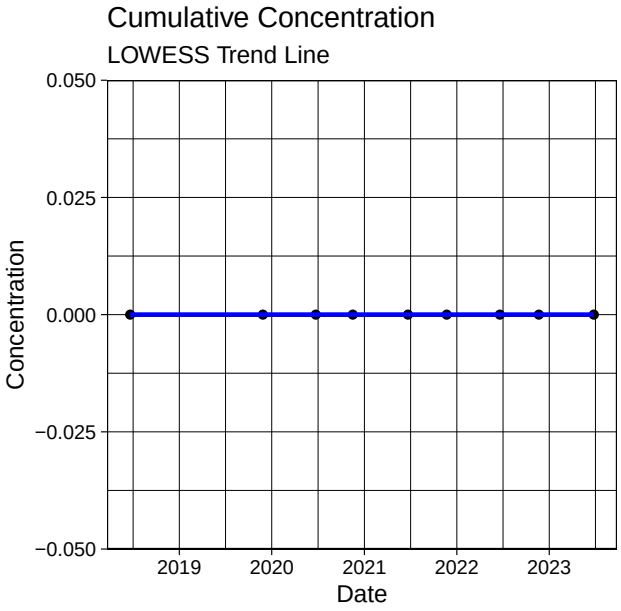




Kendall Trend Test Results Continuous	
n	9
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

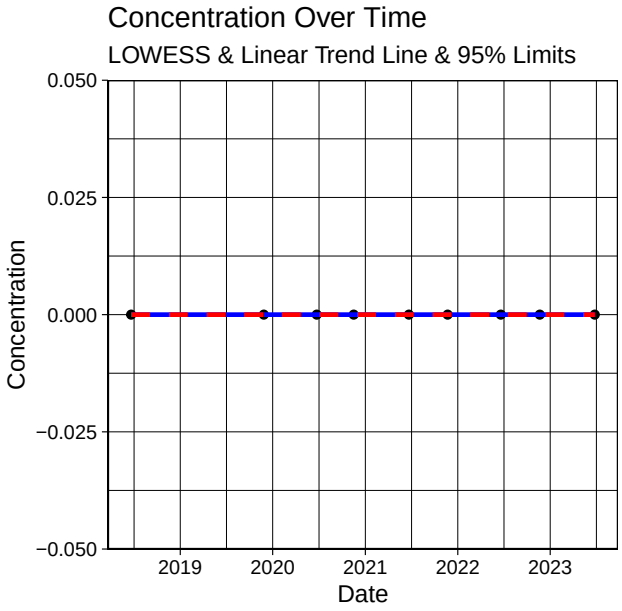
Report for ID : MW152S and Analyte : PFOA

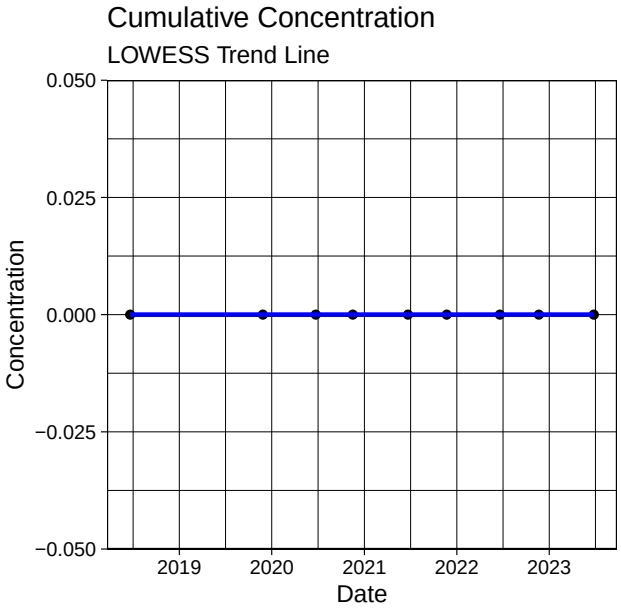




Kendall Trend Test Results Continuous	
n	9
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

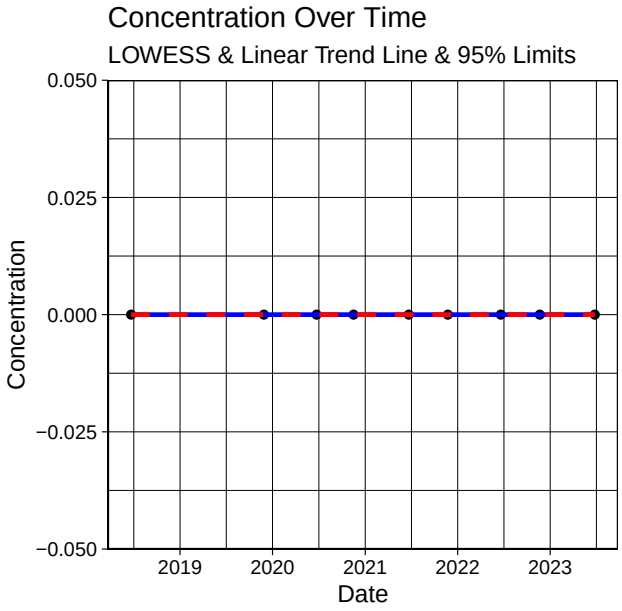
Report for ID : MW152S and Analyte : PFOS

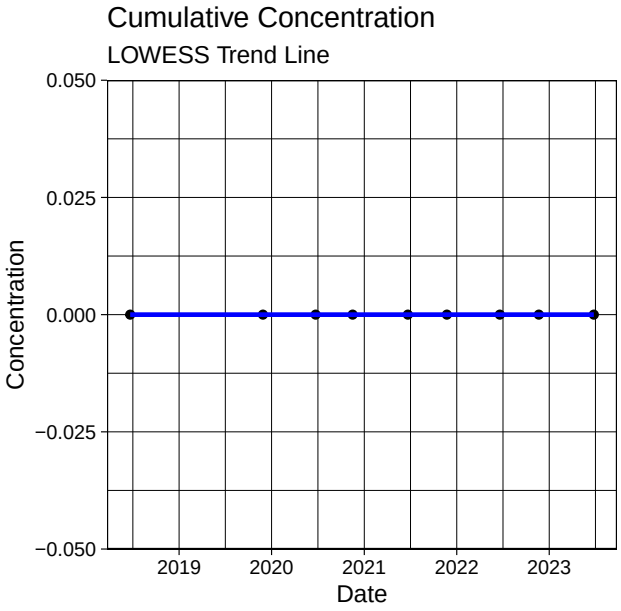




Kendall Trend Test Results Continuous	
n	9
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

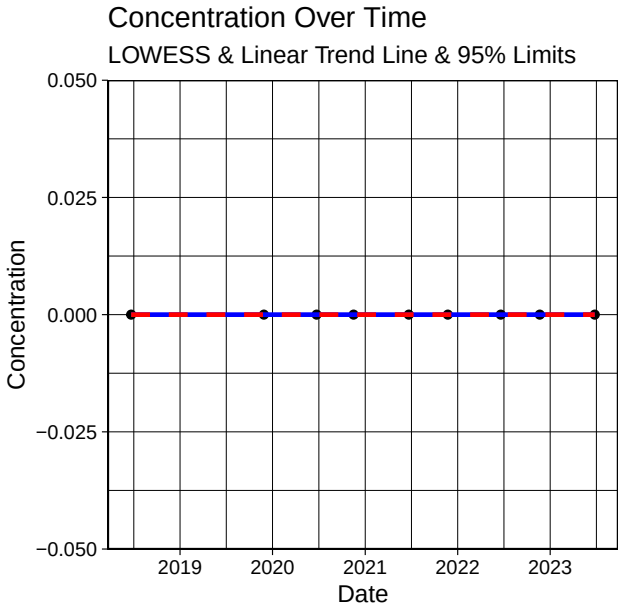
Report for ID : MW153S and Analyte : PFHxS+PFOS

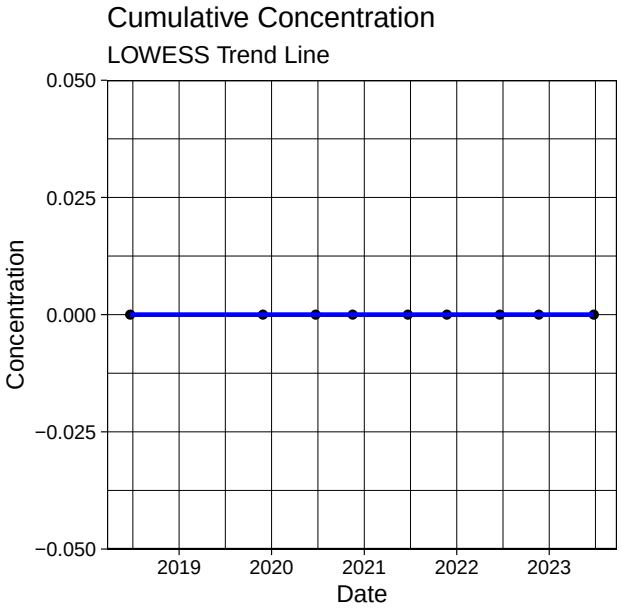




Kendall Trend Test Results Continuous	
n	9
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

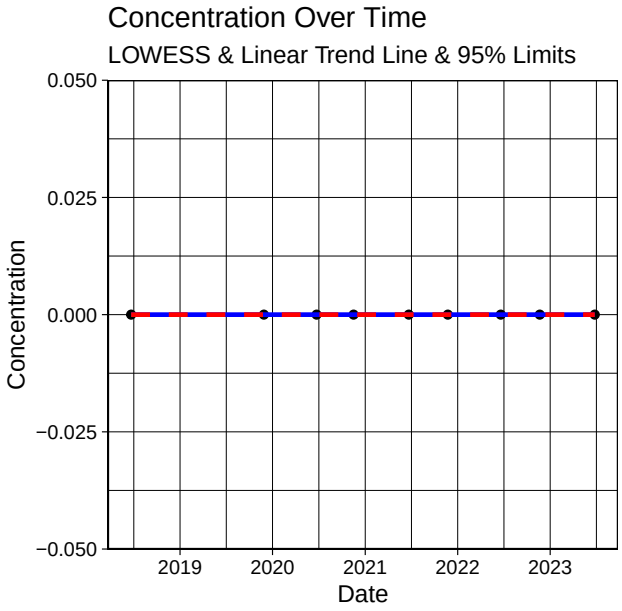
Report for ID : MW153S and Analyte : PFOA

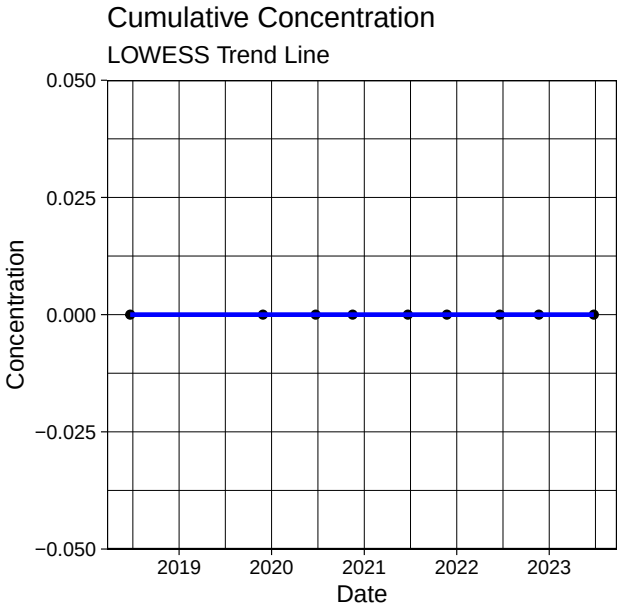




Kendall Trend Test Results Continuous	
n	9
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

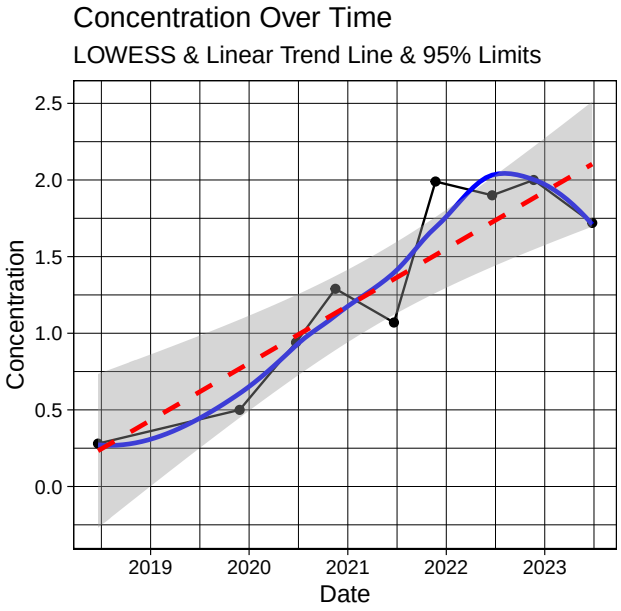
Report for ID : MW153S and Analyte : PFOS

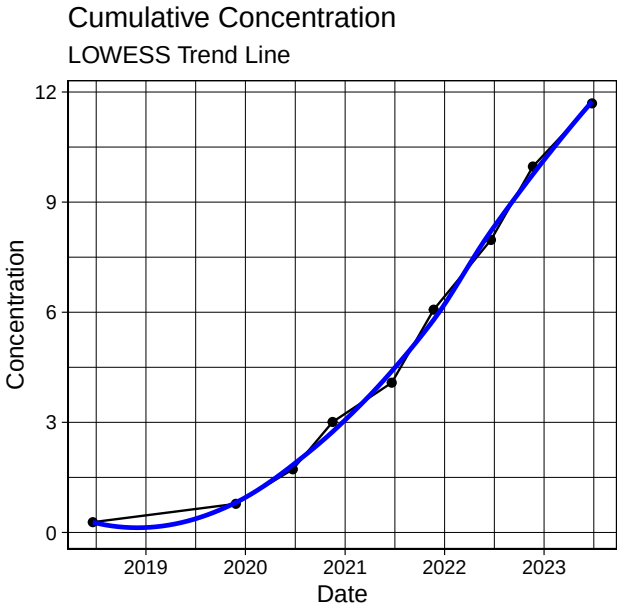




Kendall Trend Test Results Continuous	
n	9
z	2.61
p	0.01
S	26
varS	92
tau	0.72
mean	1.3
sd	0.65
cov	0.5
results	INCREASING

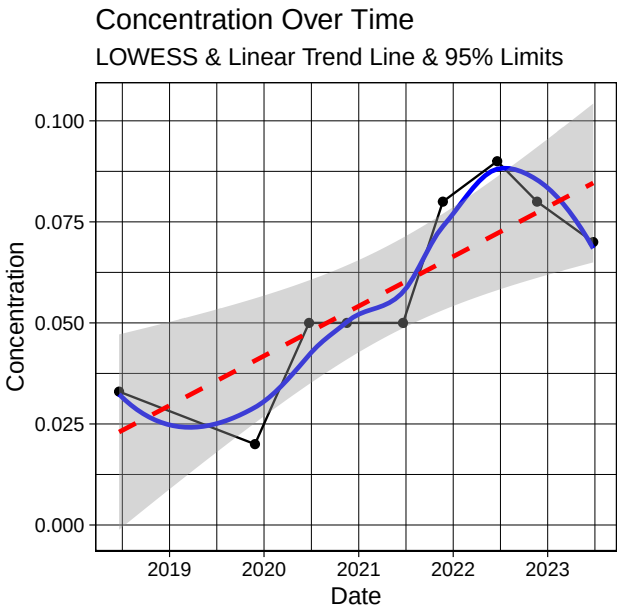
Report for ID : MW154S and Analyte : PFHxS+PFOS

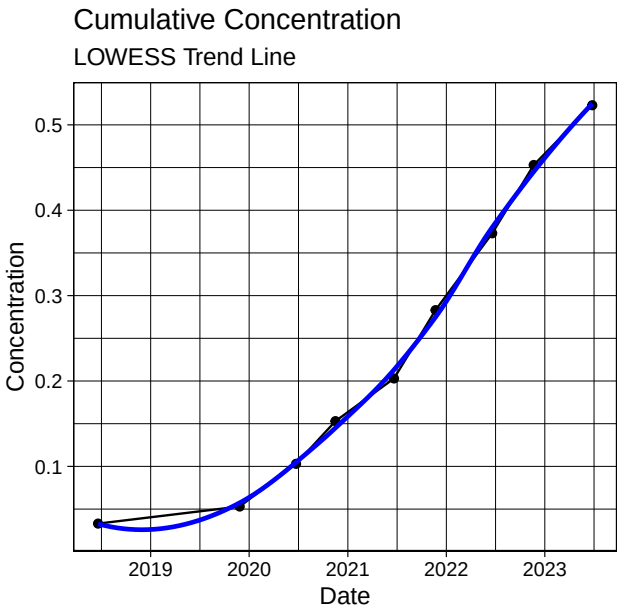




Kendall Trend Test Results Continuous	
n	9
z	2.25
p	0.02
S	22
varS	87.33
tau	0.65
mean	0.06
sd	0.02
cov	0.4
results	INCREASING

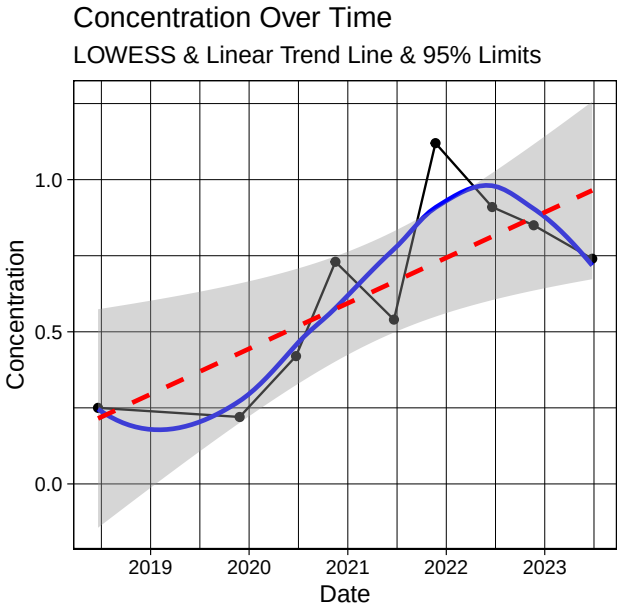
Report for ID : MW154S and Analyte : PFOA

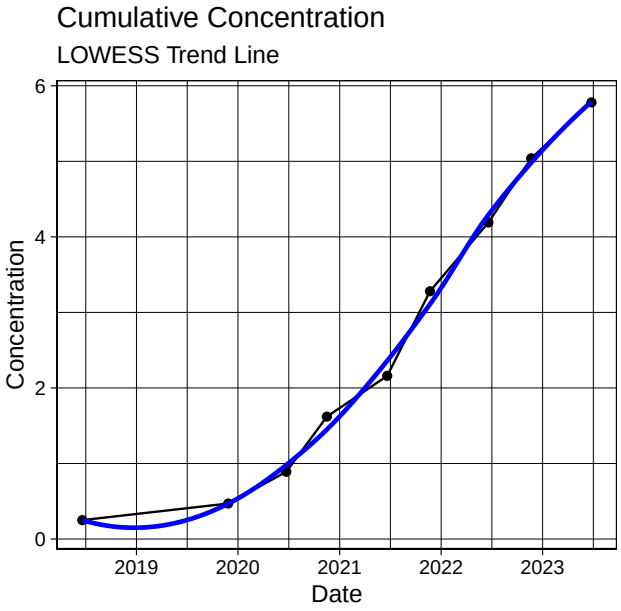




Kendall Trend Test Results Continuous	
n	9
z	1.98
p	0.05
S	20
varS	92
tau	0.56
mean	0.64
sd	0.31
cov	0.48
results	INCREASING

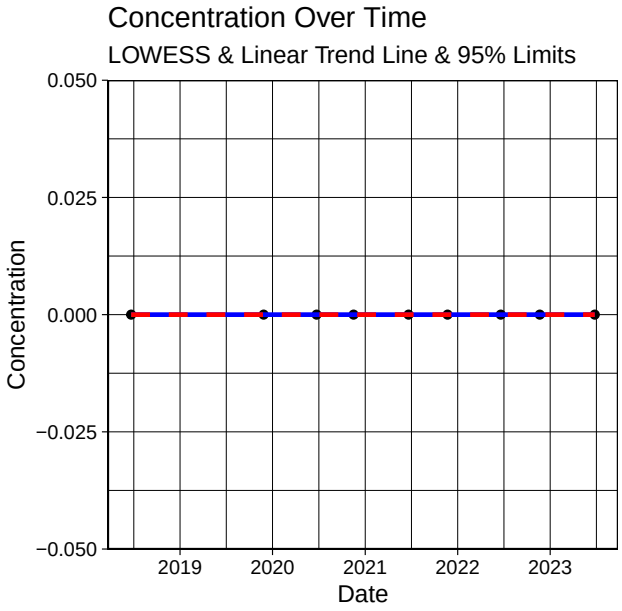
Report for ID : MW154S and Analyte : PFOS

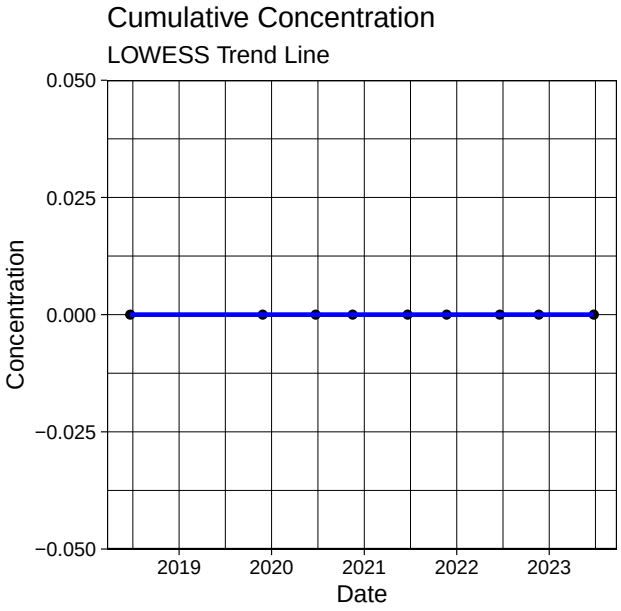




Kendall Trend Test Results Continuous	
n	9
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

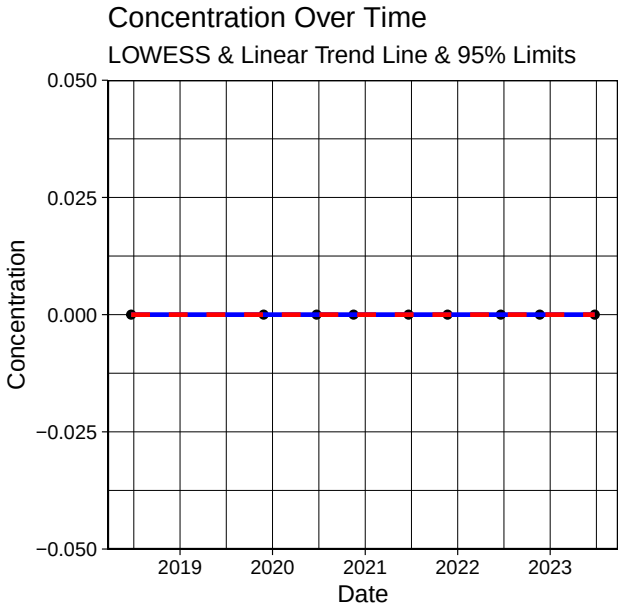
Report for ID : MW155S and Analyte : PFHxS+PFOS

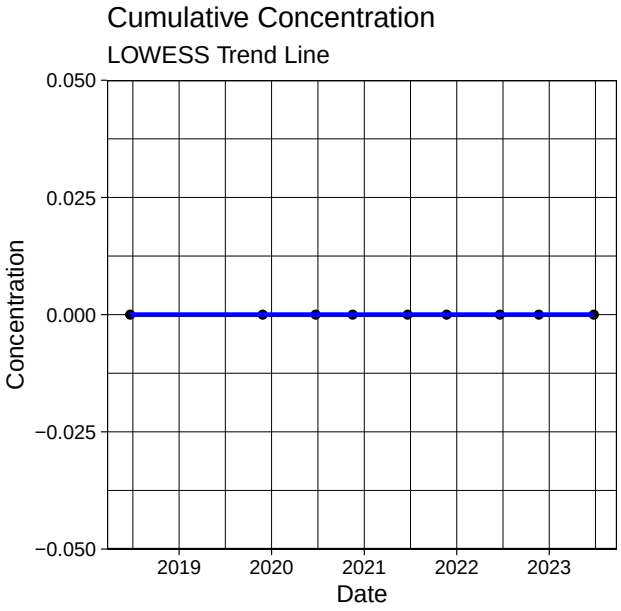




Kendall Trend Test Results Continuous	
n	9
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

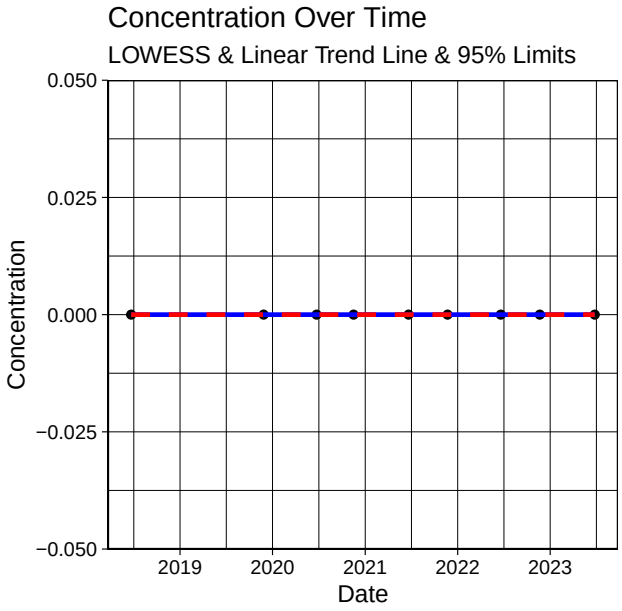
Report for ID : MW155S and Analyte : PFOA

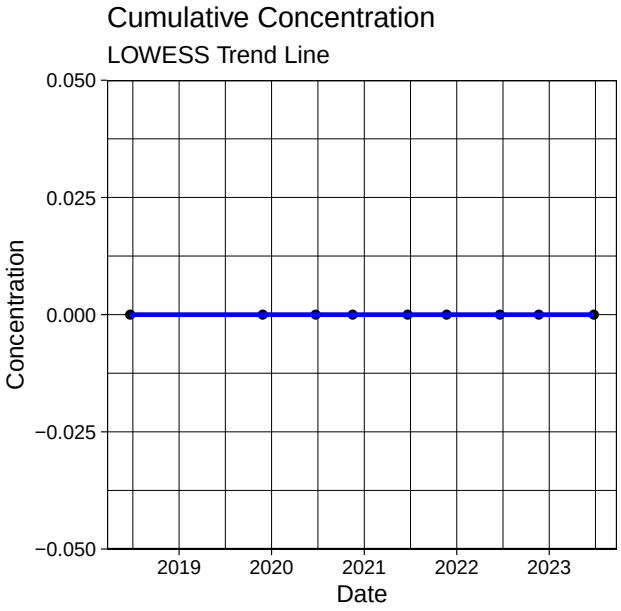




Kendall Trend Test Results Continuous	
n	9
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

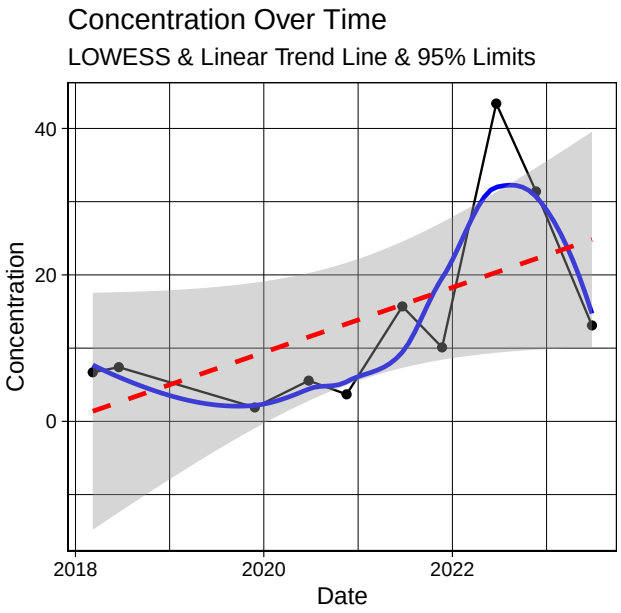
Report for ID : MW155S and Analyte : PFOS

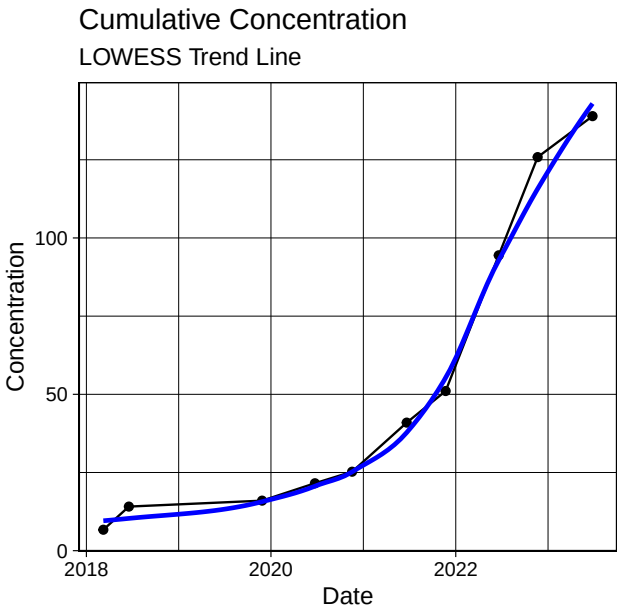




Kendall Trend Test Results Continuous	
n	10
z	1.79
p	0.07
S	21
varS	125
tau	0.47
mean	13.89
sd	13.36
cov	0.96
results	POSSIBLY INCREASING

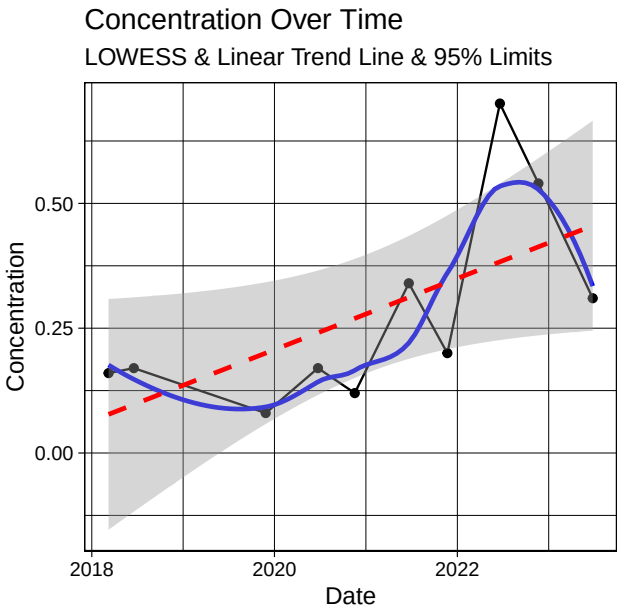
Report for ID : MW310 and Analyte : PFHxS+PFOS

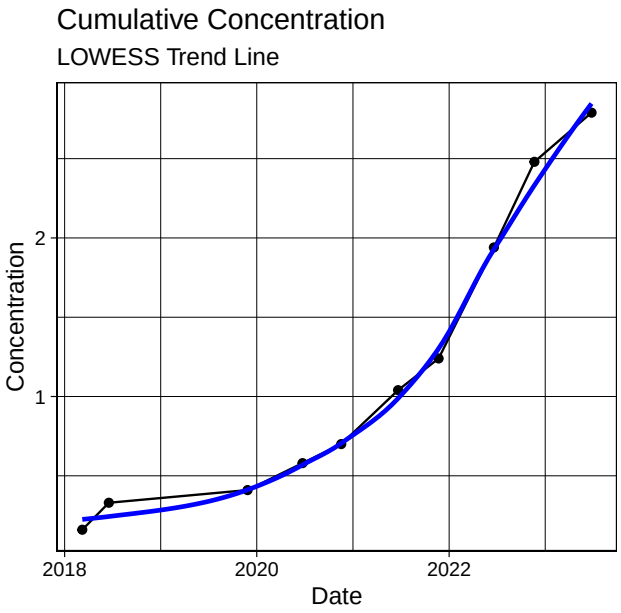




Kendall Trend Test Results Continuous	
n	10
z	2.07
p	0.04
S	24
varS	124
tau	0.54
mean	0.28
sd	0.2
cov	0.72
results	INCREASING

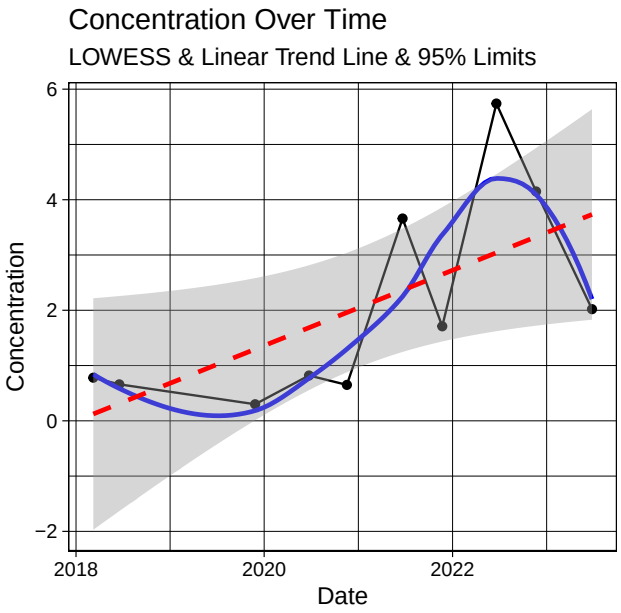
Report for ID : MW310 and Analyte : PFOA

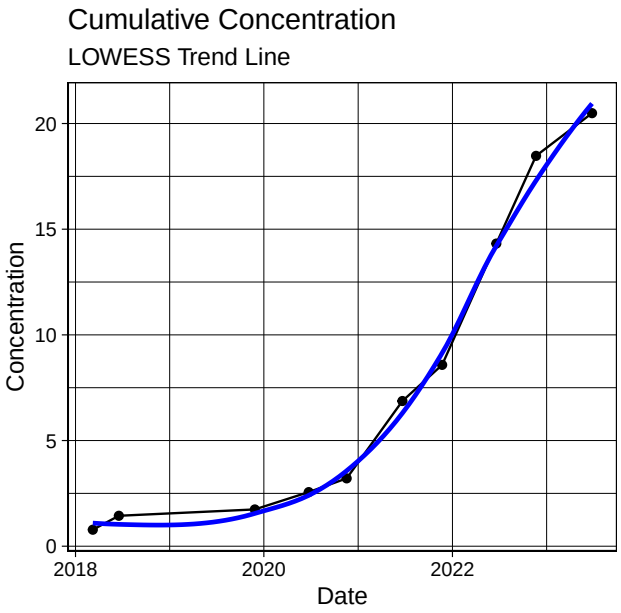




Kendall Trend Test Results Continuous	
n	10
z	1.97
p	0.05
S	23
varS	125
tau	0.51
mean	2.05
sd	1.85
cov	0.9
results	INCREASING

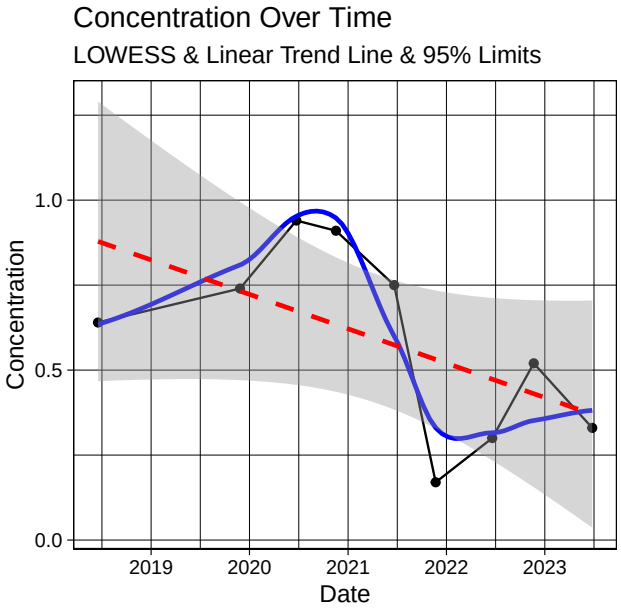
Report for ID : MW310 and Analyte : PFOS

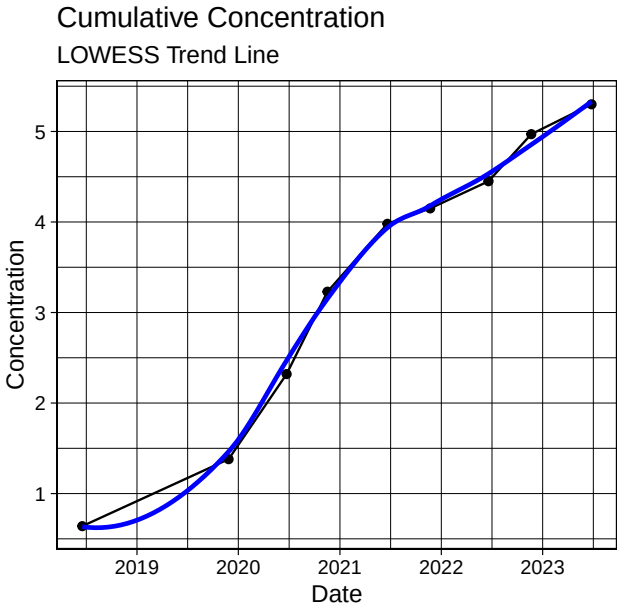




Kendall Trend Test Results Continuous	
n	9
z	-1.15
p	0.25
S	-12
varS	92
tau	-0.33
mean	0.59
sd	0.28
cov	0.47
results	STABLE

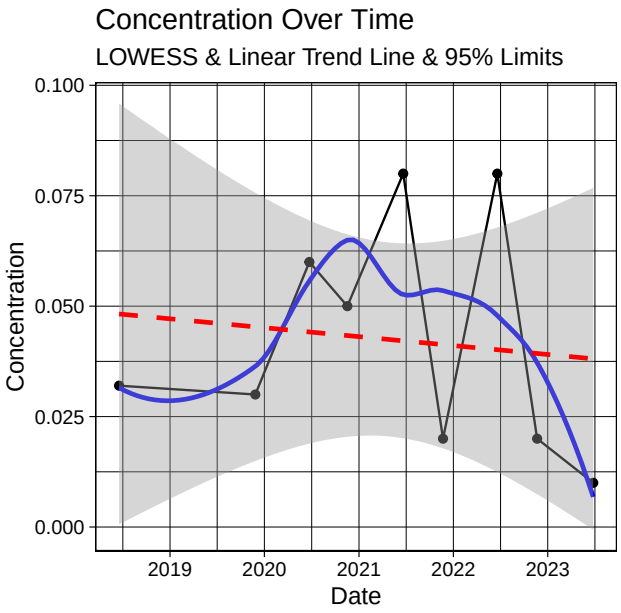
Report for ID : MW311 and Analyte : PFHxS+PFOS

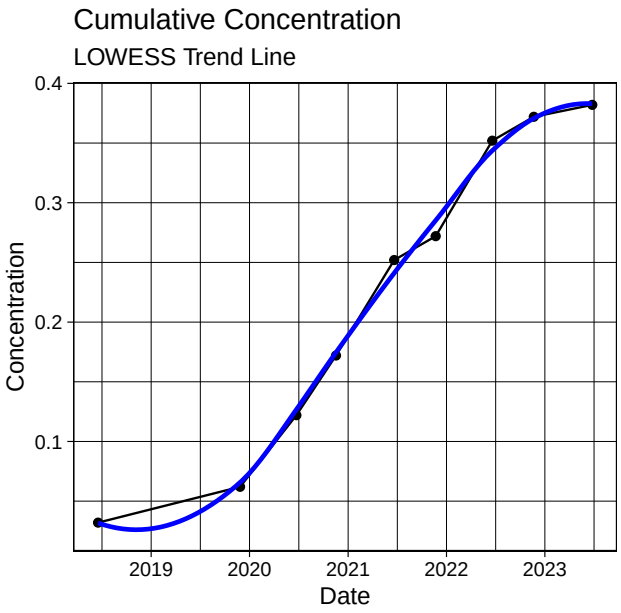




Kendall Trend Test Results Continuous	
n	9
z	-0.74
p	0.46
S	-8
varS	90
tau	-0.23
mean	0.04
sd	0.03
cov	0.62
results	STABLE

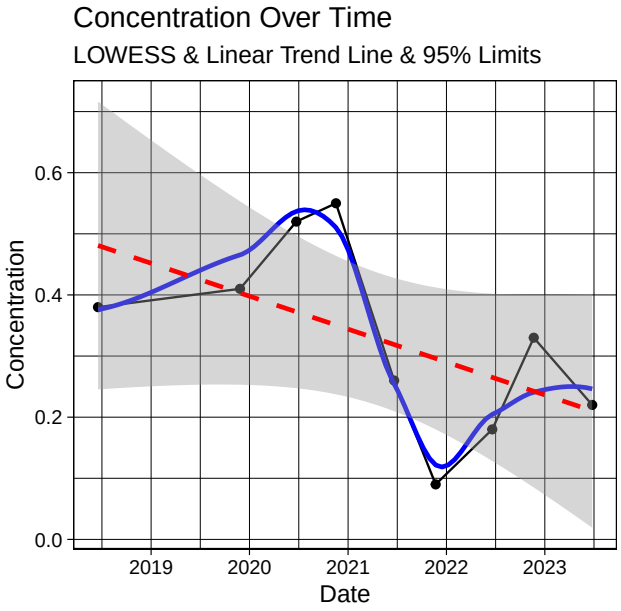
Report for ID : MW311 and Analyte : PFOA

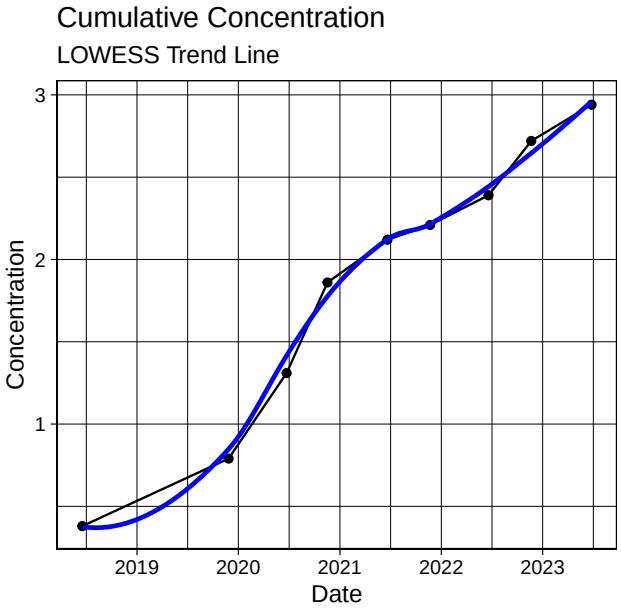




Kendall Trend Test Results Continuous	
n	9
z	-1.15
p	0.25
S	-12
varS	92
tau	-0.33
mean	0.33
sd	0.15
cov	0.47
results	STABLE

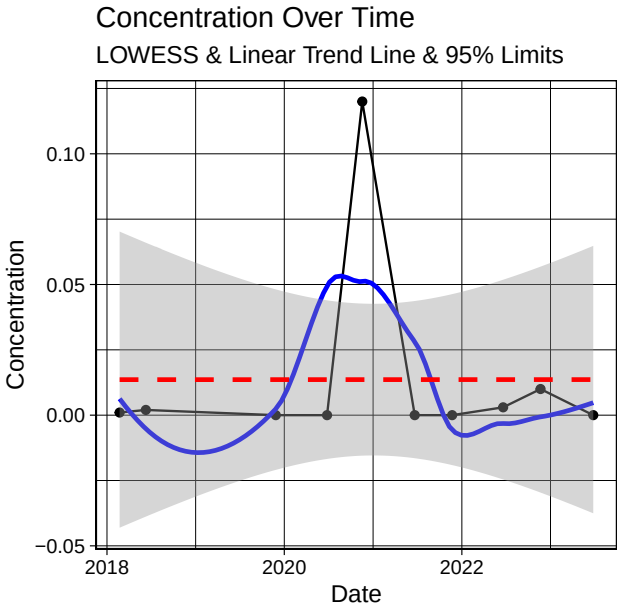
Report for ID : MW311 and Analyte : PFOS

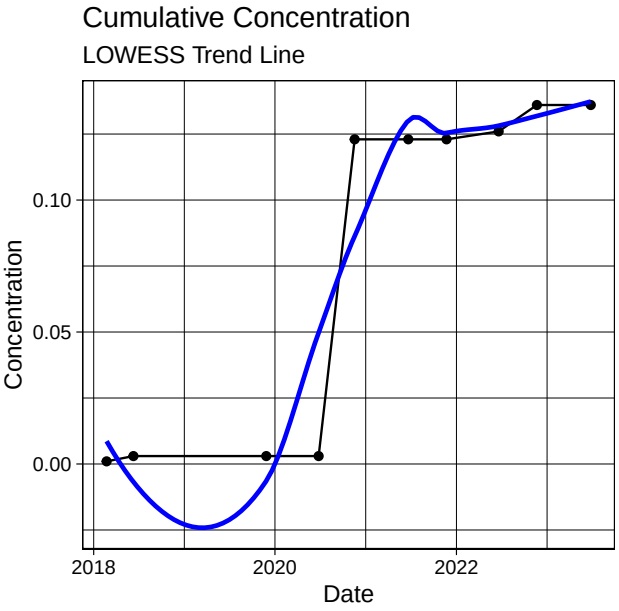




Kendall Trend Test Results Continuous	
n	10
z	0
p	1
S	1
varS	108.33
tau	0.03
mean	0.01
sd	0.04
cov	2.76
results	NO CLEAR TREND

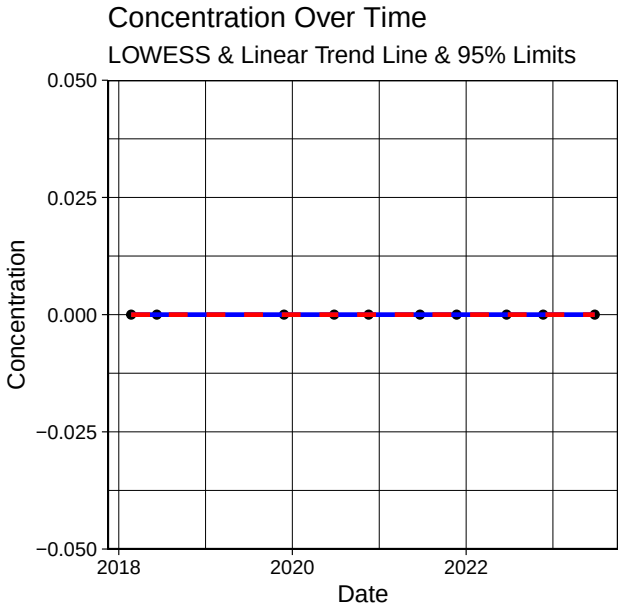
Report for ID : MW315 and Analyte : PFHxS+PFOS

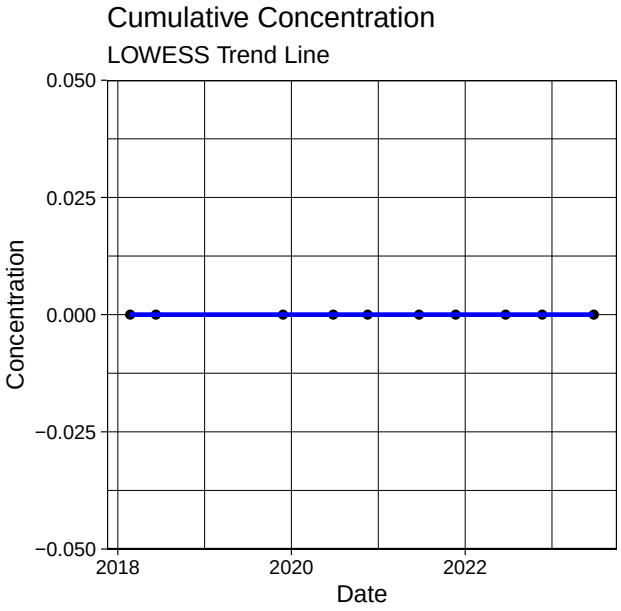




Kendall Trend Test Results Continuous	
n	10
z	NaN
p	NaN
S	0
varS	0
tau	NaN
mean	0
sd	0
cov	NaN
results	NA

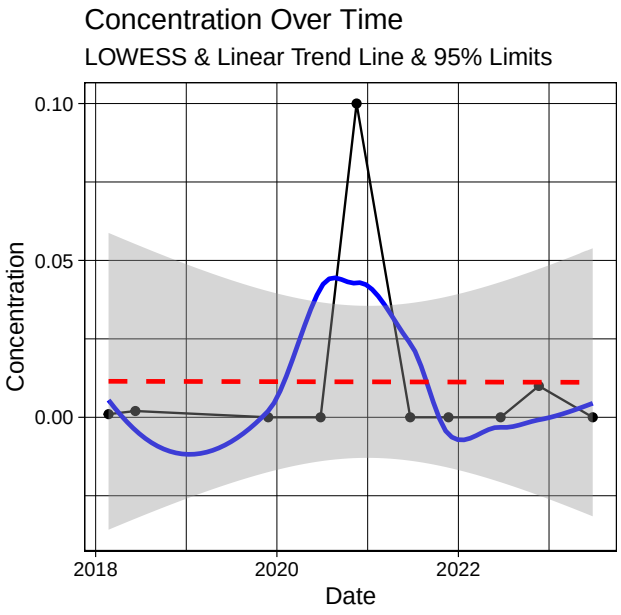
Report for ID : MW315 and Analyte : PFOA

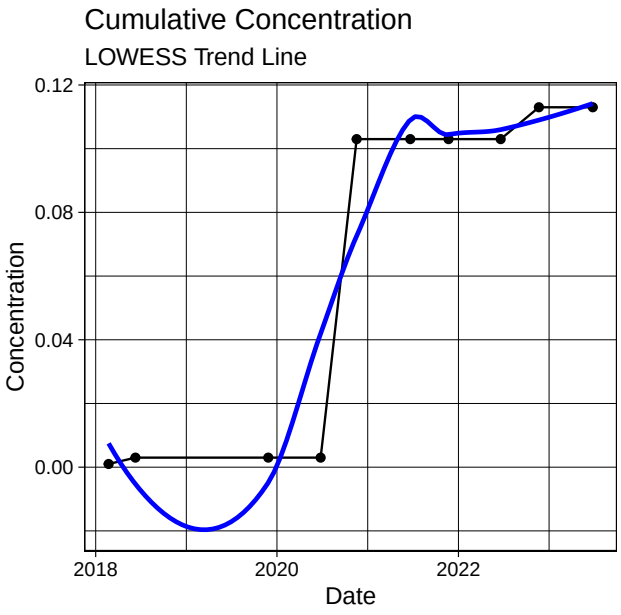




Kendall Trend Test Results Continuous	
n	10
z	-0.51
p	0.61
S	-6
varS	96.67
tau	-0.16
mean	0.01
sd	0.03
cov	2.77
results	NO CLEAR TREND

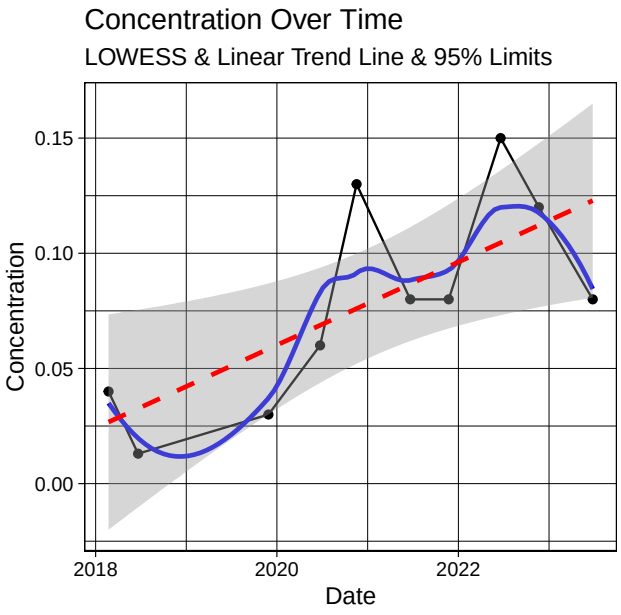
Report for ID : MW315 and Analyte : PFOS

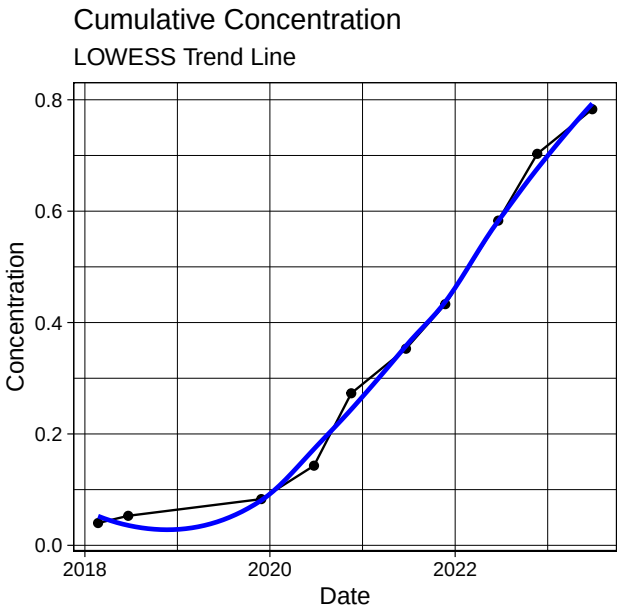




Kendall Trend Test Results Continuous	
n	10
z	2.09
p	0.04
S	24
varS	121.33
tau	0.55
mean	0.08
sd	0.04
cov	0.57
results	INCREASING

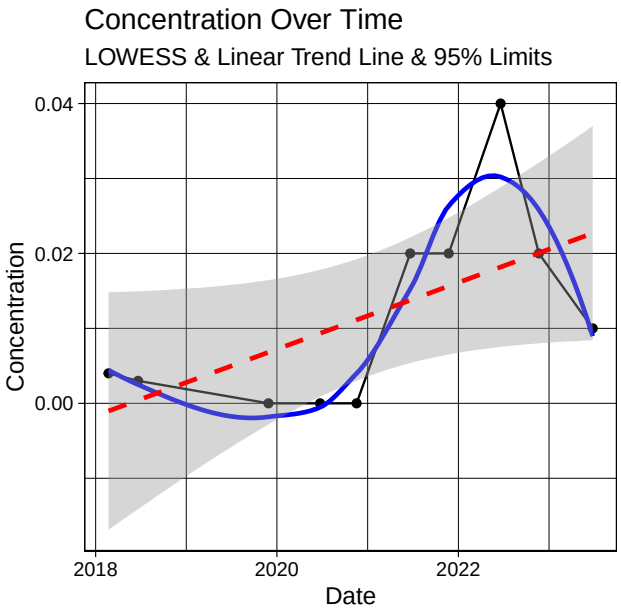
Report for ID : MW326 and Analyte : PFHxS+PFOS

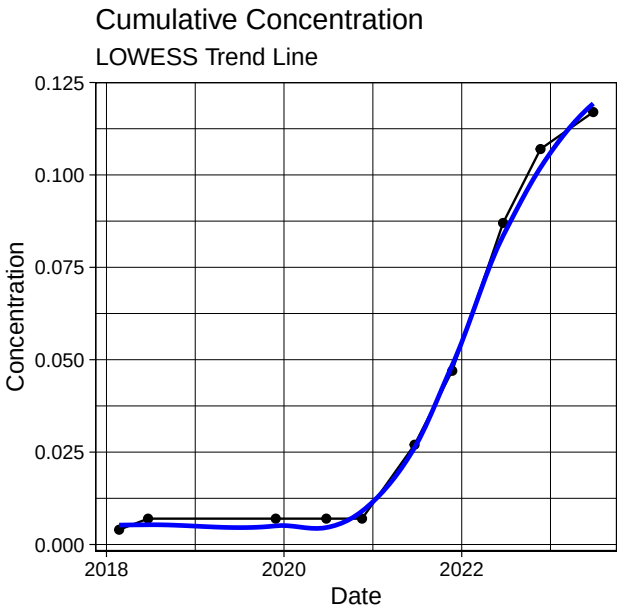




Kendall Trend Test Results Continuous	
n	10
z	1.29
p	0.2
S	15
varS	117.67
tau	0.36
mean	0.01
sd	0.01
cov	1.12
results	NO CLEAR TREND

Report for ID : MW326 and Analyte : PFOA





Kendall Trend Test Results Continuous	
n	10
z	1.64
p	0.1
S	19
varS	120.33
tau	0.44
mean	0.02
sd	0.02
cov	0.95
results	NO CLEAR TREND

Report for ID : MW326 and Analyte : PFOS

