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ABN: 68706814312

Ongoing Monitoring Interpretive Report (November 2020 - June 2023)

PFAS OMP - RAAF Base Darwin

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PFAS OMP - RAAF Base Darwin

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Executive summary

Background

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per-and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Plan (OMP) outlined in the PFAS Management Area Plan (PMAP) Department of Defence, 2019 at the Royal Australian Air Force (RAAF) Base Darwin (the base) (Site ID 1302), Northern Territory (NT).

The OMP outlines the rationale and scope for the monitoring of the concentrations and extent of PFAS in groundwater and surface water originating from the base. The monitoring program consists of multiple periodic monitoring events to capture groundwater and surface water conditions across both wet and dry seasons. Sampling under these different climatic conditions provides a better understanding of the movement and concentrations of PFAS in the environment.

The monitoring program was undertaken within the RAAF Base Darwin PFAS Management Area, as presented on **Figure F1** in **Appendix A**. The Management Area covers the entire base and selected off-base areas, including the community of Ludmilla, Darwin, and portions of the surface water systems of Rapid Creek and Ludmilla Creek.

Within the Management Area there are 11 locations identified as PFAS source areas that represent a significant source of PFAS contamination as defined in the PMAP. These areas are listed in **Section 2.3** and shown on **Figure F1**, **Appendix A** of this report.

Objective

The overarching objective of implementing the OMP is to provide information on changes in the location and concentrations of PFAS on-base and off-base within the Management Area. The data is used to assist risk management decisions by Defence to protect human health and the environment, and to inform the understanding of the effectiveness of remedial actions.

Monitoring program

AECOM completed periodic monitoring of groundwater, surface water and aquatic biota between November 2020 and June 2023 in general accordance with the sampling and analysis quality plan (SAQP) developed by AECOM. The monitoring targeted PFAS and included selected locations on-base and in surrounding off-base areas.

Interpretive analysis

Data collected during the monitoring period were compared to historical data for the included sampling locations.

PFAS concentrations within on-base and off-base groundwater were generally within the same order of magnitude of historical results and within the identified groundwater plume[1].

PFAS concentrations were generally lower at off-base locations than those observed at on-base locations, consistent with previous results.

Statistical analysis of the monitoring results for on-base groundwater locations suggests that PFAS concentrations were generally stable within the Management Area, though PFAS may continue to be mobilised from existing on-base PFAS source areas, moving from PFAS impacted soil into groundwater

What is an 'order of magnitude'?

This refers to a number 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.

[1] PFAS contaminant plumes are areas of groundwater with elevated PFAS concentrations that are slowly moving from the source areas in the same direction that the groundwater flows.

in the Darwin aquifer[2], and into on-base surface waters. Ongoing programs of work are being undertaken at the base to address on-base PFAS source areas, and remediation was carried out at two of the 11 on-base source areas during the monitoring period, including the Former fire training area (FFTA) 1 (Source Area 1) and aqueous film forming foam [AFFF] contaminated soil stockpiles (Source Area 5).

Additionally, a base wide PFAS investigation is ongoing, which will aim to define additional remedial works currently proposed for the base, and ongoing monitoring will assess changes to PFAS concentrations in groundwater following these works.

Groundwater results

Groundwater gauging data indicated that groundwater generally flows radially from the centre of the base towards the four creeks surrounding the base, with Rapid Creek to the north and Ludmilla Creek to the west functioning as the primary groundwater flow pathways. Groundwater elevations appeared to show significant differences between seasons at most monitoring locations (higher in wet season, lower in dry season). This is consistent with previous observations.

Overall, the groundwater monitoring results do not suggest a change in the understanding of contamination. The relative stability in the concentrations during the monitoring period within the Management Area suggests the plume size, particularly the lateral extent (i.e., width) is unchanged. The following was observed:

- The highest concentrations of PFAS in groundwater continue to be associated with existing on-base PFAS source areas, with increasing trends at the Former fire training area 1 (FFTA 1) and Former RAAF fire station. It is, however, noted that the reported concentrations are within an order of magnitude of historical concentrations. It is also noted that soil remediation commenced at the FFTA 1 during the monitoring period[3].
- PFAS concentrations at off-base monitoring wells were generally consistent with historical results.
- No off-base monitoring wells which have been previously sampled during the OMP, reported new exceedances during the monitoring period.
- Six on-base monitoring wells (not previously sampled under the OMP) reported exceedances of the drinking water guidelines (two exceedances of PFOA, and six exceedances of PFOS + PFHxS). These reported concentrations are consistent with historic exceedances in the monitoring wells previously sampled in the same region. As such these concentrations were not considered to represent a change in the Conceptual Site Model (CSM) or risk profile.

Surface water results

PFAS concentrations in surface water at locations on-base and off-base were generally consistent with historical results.

Reported PFAS concentrations for on-base and off-base surface water locations were within an order of magnitude of historical results. PFAS concentrations were above the recreational water guideline at five locations during the monitoring period. Three of these locations have historically exceeded recreational water guidelines, whilst monitoring of the other two locations had not been included in the OMP previously. The results at these two new locations are similar to nearby monitoring locations, and consistent with historic data.

All monitoring locations reported at least one result above the freshwater guideline value for PFOS during the monitoring period, which is consistent with historical data.

Aquatic biota results

The reported PFAS concentrations within sampled aquatic biota collected from Ludmilla Creek and Rapid Creek are consistent with historical data. Overall, PFAS concentrations in sampled aquatic biota remains consistent with the understanding presented in the PMAP (Defence, 2019).

[2] An aquifer is an underground layer of porous and permeable rock, gravel, sand or silt, which can contain or transmit groundwater that lies within the geology below the soil surface.
[3] The Former RAAF fire station has been identified for additional investigations to support remedial actions.

CSM and risk profile

The conceptual site model (CSM) was reviewed in light of the monitoring data collected during the current monitoring period between November 2020 and March 2023, and no changes were identified to sources, pathways or receptors at the base or within the Management Area that may require an update to the CSM as described in the PMAP (Defence, 2019). The findings of the interpretive analysis conducted for the monitoring period are considered consistent with the risk profile for the Management Area.

Conclusions

The following conclusions are based on the data collected during the monitoring period:

- Groundwater levels fluctuate across the Management Area over the wet and dry seasons, with higher groundwater levels recorded in the late wet season and lower groundwater levels recorded in the late dry season. The inferred groundwater flow follows the localised topography, flowing north (towards Rapid Creek) from the southern side of the main runway to the south (towards Sadgroves and Reichardt Creek) in the south of the base, and to the west (towards Ludmilla Creek) in the southwest of the base.
- The results for the monitoring period indicate that the nature and extent of PFAS in groundwater, surface water and aquatic biota are consistent with previous findings.
- Fluctuations in PFAS concentrations were reported, which were likely to have been due to seasonal variability of Darwin's wet and dry seasons. Concentrations of PFAS in groundwater are generally stable or decreasing. Where concentrations appear to have increasing trends, it is noted that these areas (namely at MW103 and MW422) are the focus of remedial activities (either proposed or ongoing).
- The CSM was reviewed, and based on the results presented within this report, no changes were identified to source, pathway or receptors at the base and within the Management Area.
- Based on the data collected during the monitoring period, no changes to the risk profile were identified.
- The monitoring conducted over the monitoring period is considered to have met the objectives of the SAQP and the OMP. The groundwater monitoring network is considered generally appropriate and sufficient for the program objectives, with the following observations:
    - There is a lack of monitoring wells northwest of Source Area 7, 8 on the base's western portion.
    - One well in monitoring Source Area 7 (MW405) has been destroyed during recent construction activities in the area. Down hydraulic gradient wells, not currently sampled under the OMP are present in this area and monitoring the areas adjacent to the two source areas would reduce uncertainty.
    - Remedial works being undertaken during the monitoring period have limited access to the well monitoring Source Area 1 (MW422). Down hydraulic gradient wells not currently sampled under the OMP are present in this area and monitoring the areas adjacent to the two source areas would reduce uncertainty.
- Ongoing monitoring of groundwater, surface water and biota as part of the OMP will continue to monitor the nature and extent of PFAS, potential migration and any associated changes to the risk profile.

Abbreviations and acronyms

Abbreviation	Term
ADWG	Australian Drinking Water Guidelines
AECOM	AECOM Australia Pty Ltd
AFFF	Aqueous Film Forming Foam
ARFF	Aviation Rescue Fire Fighting
BOM	Bureau of Meteorology
CFTA	Current fire training area
CSM	Conceptual Site Model
Defence	Department of Defence
DENR	Department of Environment and Natural Resource
DIA	Darwin International Airport
DoH	Department of Health
EC	Electrical Conductivity
FFF	Former fuel farm
FFTA	Former fire training area
FSANZ	Food Standards Australia New Zealand
GWE	Groundwater Elevation
HHRA	Human Health Risk Assessment
LOR	Limit of Reporting
MW	Monitoring Well
NATA	National Association of Testing Authorities
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
NSW	New South Wales
NT	Northern Territory
OLA	Ordnance Loading Area
OMP	Ongoing Monitoring Plan
ORP	Oxidation Reduction Potential
PFAS	Per- and poly-fluoroalkyl substances
PFHxS	Perfluorohexanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance and Quality Control
RAAF	Royal Australian Air Force
TDI	Tolerable Daily Intake

List of units

Unit	Definition
AHD	Australian Height Datum
cm	centimetre
°C	degrees Celsius
g	grams
km	Kilometre
L	litre
ML	Megalitre
m	metre
mAHD	metres Australian Height Datum
mbtoc	metres below top of casing
µg	micrograms
µS	microsiemens
mg	milligrams
mV	millivolts
NTU	Nephelometric Turbidity Unit

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Plan (OMP) at Royal Australian Air Force (RAAF) Base Darwin (the base), Northern Territory (NT) (**Figure F1** in **Appendix A**).

The monitoring targeted PFAS and included selected locations on-base and in surrounding off-base areas as defined by the NT Government (**Figure F3** in **Appendix A**).

In order to meet the objectives of the OMP, the monitoring was undertaken in accordance with the *Sampling and Analysis Quality Plan* (SAQP) (AECOM, 2023a). Note that the SAQP is generally updated prior to each monitoring event.

This report has been prepared in accordance with the Defence *PFAS OMP Annual Interpretive Report Guidance Version 4.0* (Defence, 2022) and summarises monitoring data collected between November 2020 and June 2023 (hereafter known as the monitoring period). It is acknowledged that concurrent programs of work being delivered by Defence outside of this current monitoring period was also used to further refine the understanding of the conceptual site model for the base and Management Area. A summary of these ancillary works is presented in **Section 6.0**.

1.1 Purpose and objectives

The objective of the monitoring program set out in the OMP is to provide information on changes in the location and concentrations of PFAS on-base and in surrounding off-base areas including the Management Area as defined by the NT Government. The data is required to assist risk management decisions by Defence and Territory Government agencies to protect human health and the environment and to inform the understanding of the effectiveness of remedial actions.

Assessing changes in the distribution, concentration, and transport (pathways and flow rates) of the contaminants against appropriate guideline values provides an:

- evidence-based approach for targeted and effective risk management decision making to protect human health and environmental receptors; and
- early warning that additional management of PFAS contamination may be warranted in areas not currently understood to be affected by PFAS.

The monitoring data will be evaluated to assess environmental variability and trends in PFAS concentrations. This will inform changes to the known risk profile and recommendations for triggers to review the OMP and PFAS Management Area Plans (PMAP) (Defence, 2019), if required.

1.2 Scope

The scope of works for this interpretive report included assessing changes to the nature and extent of PFAS during the monitoring period, in additional to interim monitoring data and historical OMP investigations and evaluating if these changes have implications for the understanding of the Conceptual Site Model (CSM) and the risk profile with respect to PFAS impacts at the base. This assessment included the evaluation of data reported in the following factual reports, as well as other data provided by Defence and ancillary external data sources:

- RAAF Base Darwin – Sampling Event Factual Report – 2023 Wet Season (AECOM, 2023b)
- RAAF Base Darwin – Sampling Event Factual Report – 2022 Dry Season (AECOM., 2022b)
- RAAF Base Darwin - Sampling Event Factual Report – November 2021 to March 2022 (AECOM, 2022a)
- RAAF Base Darwin - Sampling Event Factual Report - November 2021 (AECOM, 2021c)
- RAAF Base Darwin - Sampling Event Factual Report - April and May 2021 (AECOM, 2021b)
- RAAF Base Darwin - Sampling Event Factual Report - November 2020 to January 2021 (AECOM, 2021a).

In addition to the above reports pertaining to the monitoring period, the following historical documents were also evaluated:

- RAAF Base Darwin – PFAS OMP Annual Interpretive Report – November 2019 to April 2020 (AECOM, 2020)
- RAAF Base Darwin - Annual PFAS Monitoring Report - March 2019 (Coffey, 2019a)
- RAAF Base Darwin - Interim PFAS Monitoring Report December 2018 (Coffey, 2019b).

Ancillary external data sources included stream gauging and meteorological data (see **Section 6.4**)

2.0 Site setting

2.1 Site identification

The base identification and setting is summarised in **Table 1** below:

Table 1 Site setting and CSM summary

Element	Description
Site ID	RAAF Base Darwin, Site number 1302
Location	RAAF Base Darwin is located on the Stuart Highway approximately seven kilometres from the business centre of Darwin, adjacent to the suburbs of Winnellie, Ludmilla, Coconut Grove, Millner, Jingili, Moil, Anula, Malak, Karama and the North Lakes Estate (**Figure F1** in **Appendix A)**. The base encompasses an area of 1,278 hectares bounded by McMillans Road and the Northlakes Estate/Marrara Sports Complex to the north, Amy Johnson Avenue to the east, Stuart Highway to the south and Bagot Road to the west. Darwin International Airport (DIA) occupies an area within the northwest of the base (**Figure F1** in **Appendix A)**. The base is an operational joint civil-military airfield. The base has administrative, accommodation, recreational and operational support facilities as well as technical workshops, aircraft hardstands and aircraft pavements. In addition to civil aircraft operations, the airfield supports both Australian and international military aircraft operations. Aircraft movement areas (runways and taxiways) are utilised by both civilian air operations and Defence.
Regional climate	The annual climate of the surrounding Darwin region is split into two parts, being the wet season and the dry season. The wet season generally lasts from November to April and consists of periodic heavy rains in hot and humid conditions. The dry season generally lasts from May to October and consists of mild to warm rainless weather. Darwin has an annual average rainfall of 1723 mm (BOM, 2023).
Topography, geology, and hydrogeology	The base is generally flat and low-lying with some minor undulations. Elevations range between 10 m and 33 m Australian Height Datum (AHD) being highest at the main runway and sloping down to the northern and western boundaries. The geology underlying the base comprises the following lithology: • Lower Cainozoic aged unconsolidated sands, clayey sands, ferruginous clayey sands, and soil commonly containing limonite pisolites. This layer is often described as lateritic or ferricrete and may appear to be gravels. Based on field observations, this layer has variable thickness across the base, ranging from less than 1 m to more than 10 m thick in places. • Bathurst Island Formation consisting of claystone, sandy claystone, clayey sandstone, quartz sandstone, ferruginous sandstone, glauconitic sandstone, and conglomerates towards the base of the unit. • Upper Proterozoic aged Burrell Creek Formation consisting of siltstone, shale, sandstone, and quartz pebble conglomerate. The top of this unit was generally encountered at depths of 35 m below the ground. The unconfined aquifer is present in the upper lateritic sediments and within the Bathurst Island Formation. No significant confining layers are observed and the two lithologies act as a single unconfined aquifer. The upper lateritic

Element	Description
	unit has a greater porosity and yield than the lower claystone/siltstone where porosity is aided by the presence of honeycomb structures. During the wet season groundwater flows through both lithologies; however, during the dry season when water levels fall, groundwater predominantly flows in the Bathurst Formation. A deeper, regional aquifer is understood to be present within the Upper Proterozoic Burrell Creek Formation which is a confined aquifer comprising siltstone, shale and sandstone and quartz pebble conglomerate.
Groundwater depth and flow	Groundwater generally flows radially from the centre of the airfield in the vicinity of the Ordnance Loading Area (OLA), generally following the topography towards creek systems and the coastline located to the south, west and north. Groundwater elevations fluctuate by up to 10 m between wet and dry seasons to the north and west of the base and by approximately 5 m to the south of the base.
Vegetation	The area of the base is predominantly cleared and maintained as an operating facility. Areas of maintained grass and large trees are present in the southwestern portion of the base around ovals, parks, and streets. Patches of remnant Eucalyptus woodland are present in the southeastern and northern parts of the base. Forests, swamps, and woodlands occur in the Marrara Swamp, which forms a large part of the northeastern part of the base, and in the riparian zone of Rapid Creek.
Management Area drainage	The drainage system on RAAF Darwin includes large, open, unlined drains, municipal drains and underground piping that discharge surface waters into four main catchment areas, being: • Rapid Creek on the north and east sides of RAAF Darwin. The lower portion of Rapid Creek is estuarine while the upper portion is fed by groundwater discharge during the dry season. Rapid Creek discharges to Beagle Gulf • Sadgroves Creek towards the south. Sadgroves Creek is an estuarine creek and discharges to Darwin Harbour • Ludmilla Creek towards the west. Ludmilla Creek is a mixture of freshwater, estuarine water and marine water and discharges to Beagle Gulf • A small central portion of RAAF Darwin on the southern boundary discharging into Reichhardt Creek and Darwin Harbour.
Current and previous land use	The base was constructed in 1940 as an operational military airfield. The base is now a joint civil-military airfield with DIA located to the north of the airstrip. The base is bound in all directions by Stuart Highway, Bagot Road, McMillians Road, and Amy Johnson Avenue. Current surrounding land uses detailed in the PMAP are summarised as: • North: DIA, Marrara Swamp, and vegetation corridor. The residential suburb Rapid Creek is located beyond DIA • East: Nurseries, small farms, residential areas, and industrial/ commercial zones

Element	Description
	• South: Industrial suburb of Winnellie and Darwin Showgrounds. The residential suburb of The Narrows is located to the southeast of the base • West: Residential suburbs of Bagot and Ludmilla and the industrial portion of Coconut Grove • Off-base land-use is mostly unchanged during the monitoring period with exception to minor construction works (road improvements, building improvements, Defence housing demolition etc.).

2.2 Management Area

The location of the base and the Management Area as defined by the PMAP (Defence, 2019) is shown in **Figure F1** (**Appendix A**). The Management Area covers all the base (groundwater and surface water) and discrete areas off-base, which includes groundwater beneath part of Ludmilla and under DIA, and surface water systems of Rapid Creek and Ludmilla Creek.

2.3 Source areas

The PMAP (Defence, 2019) identifies the 11 areas listed in **Table 2** as PFAS source areas (**Appendix A, Figure F1**) for the base.

Table 2 Inferred PFAS source areas

Source ID	Area
1	Former fire training area (FFTA) 1
2	Former fuel farm (FFF) 5
3	FFF 4
4	FFF 6
5	Aqueous Film Forming Foam (AFFF) Contaminated Soil Stockpiles
6	Former aviation rescue firefighting (ARFF) fire station
7	Hangar 31
8	FFF 1
9	Former RAAF fire station
10	FFTA 2
11	Current fire training area (CFTA)

3.0 Sampling and analytical scope and methodology

3.1 Sampling and analysis methodology

The SAQP (AECOM, 2023a) (included in **Appendix B**) provides the sampling schedule, rationale, and methodologies. The SAQP prescribes:

- biannual on-base and off-base groundwater sampling, undertaken at the end of the wet season (Q2 2021 - 2023) and the end of dry season (Q4 2020 - 2022)
- surface water sampling (on-base and off-base), undertaken at the start of wet season (Q4/Q1 2020 - 2022) and the end of wet season (Q2 2021 – 2023)
- annual biota sampling (Q4/Q1 2020 – 2022)
- monthly wet season surface water sampling (limited to the Q4 2022 to Q2 2023 during the monitoring period) as part of the most recent SAQP revision
- first of two dry season surface water sampling events (Q3 2023).

Details of the completed scope have been provided in **Section 3.2**.

3.2 Summary of monitoring

A summary of the monitoring implemented as part of the SAQP (AECOM, 2023a) between November 2020 and June 2023 is provided in **Table 3**, below.

Table 3 Summary of monitoring

Event	Sampling matrix	Number of sample locations
Biannual end of dry season on-base/off-base (2 to 4 November 2020)	Groundwater	31 of 32 locations
Annual Aquatic Biota Sampling (3 to 12 November 2020)	Biota	6 of 6 locations
Start of wet season on-base /off-base (16 to 18 December 2020)	Surface water	19 of 22 locations
End of wet season off-base /on-base (28 to 29 April and 6 May 2021)	Groundwater	30 of 31 locations
Monthly wet season & end of wet season off-base /on-base (28 to 29 April and 6 May 2021)	Surface water	17 of 22 locations
Biannual end of dry season on-base /off-base (9 to 11 November 2021)	Groundwater	30 of 34 locations
Annual Aquatic Biota Sampling (8 November and 3 December 2021)	Biota	6 of 6 locations.
Start of wet season & monthly wet season on-base /off-base (13 to 17 January 2022)	Surface water	22 of 22 locations
Twice in wet season off-base / on-base (2 March 2022)	Surface water	2 of 3 locations
Biannual end of wet season on-base /off-base (7 to 10 March 2022)	Groundwater	30 of 31 locations
Biannual end of wet season base-wide Mass Flux (8 and 9 March 2022)	Groundwater	4 of 4 locations
Monthly wet season off-base /on-base	Surface water	19 of 22 locations

Event	Sampling matrix	Number of sample locations
(14 to 16 March 2022)		
1st monthly dry season sampling off-base (30 June 2022)	Surface water	1 of 1 location
2nd monthly dry season sampling off-base (26 August 2022)	Surface water	1 of 1 location
Biannual end of dry season on-base /off-base (28 to 29 September, and 10 and 21 October 2022)	Groundwater	29 of 34 locations
Annual Aquatic Biota off-base (25 and 31 October 2022)	Biota	6 of 6 locations
Start of wet season off-base / on base (23 to 25 November)	Surface water	21 of 22 locations
Monthly wet season off-base / on-base (22 December 2022)	Surface water	4 of 4 locations
Monthly wet season off-base / on-base (25 January 2023)	Surface water	4 of 4 locations
Monthly wet season off-base / on-base (21 February 2023)	Surface water	4 of 4 locations
Biannual end of wet season on-base / off-base (13 and 29 March 2023)	Groundwater	34 of 34 locations
Monthly wet season off-base / on-base (27 to 28 March 2023)	Surface water	24 of 24 locations
Monthly wet season off-base / on-base (14 April 2023)	Surface water	4 of 4 locations

3.3 Deviations from the SAQP

Deviations from the scope outlined in SAQP for the monitoring period are summarised in **Table 4** below.

Table 4 Summary of SAQP deviations

SAQP requirement	Sampling event deviation	Impact of deviation on data set
Start of wet season sampling event December 2020 to January 2021		
Sampling of all OMP surface water locations.	Monitoring locations SW156 and SW160 were dry and not able to be sampled.	Given that these locations were able to be sampled three times in subsequent surface water sampling events undertaken during the monitoring period, this deviation is considered not to impact on the OMP data set.
	Monitoring location SW101 inaccessible due to the installation of a security fence and has not been sampled since April 2021.	Nearest alternate location from upper Rapid Creek (downgradient of the runway areas) on the base is SW152. This location is considered to be representative for surface water conditions in this area of the base, with similar PFAS concentrations to SW101. Monitoring of SW152 was completed three times during the monitoring period since the loss of access to SW101. Therefore, this deviation is considered not to impact on the OMP data set.
End of dry season groundwater sampling event November 2020		
Sampling of all OMP groundwater locations.	Monitoring location MW405 was lost (destroyed) and not sampled.	Nearby well, MW215 (the source zone well for FFF1: Source Area 8), located down hydraulic gradient from the lost MW405 was able to be sampled. Given the proximity of MW215 to MW405, the impact of the lack of data from Source Area 7 is considered to be minimised, however there is now a lack of monitoring locations to the northwest of Source Areas 7 and 8. This is discussed further in **Section 8.3.2** and **Section 11.0**.
	Monitoring location MW292 was sampled in lieu of damaged well MW133.	MW133 was repaired in April 2021 and able to be sampled during subsequent sampling events undertaken six times during the monitoring period. Therefore, this deviation is considered not to impact on the OMP data set.
	Depth to water readings were not obtained at the following three locations:	Groundwater elevation contour was still able to be interpreted for the sampling event as adequate contingency gauging locations were gauged.

SAQP requirement	Sampling event deviation	Impact of deviation on data set
	• MW405 possibly destroyed during construction works. • MW133 has been damaged not able to be gauged or sampled. • MW240 had the HydraSleeve™ dislodged and groundwater depth not measured.	Therefore, these deviations are considered not to impact on the OMP data set.
End of wet season groundwater and surface water sampling event April – May 2021		
Sampling of groundwater and surface water in March as per SAQP.	Sampling was undertaken in April and May 2021 for the groundwater and surface water sampling events which was outside the end of wet season. Note that SAQP and the OMP identifies March as the target date for end of wet season.	The sampling period is still considered to be within the indicative wet season, which is December to May (per Appendix A of SAQP (AECOM, 2023a). Therefore, this deviation is considered not to impact on the OMP data set.
	Gauging of some of the scheduled groundwater wells within a 24-hour period was not possible due to delays related to access limitations.	Given that majority of the locations were able to be gauged within the 24-hr period, and in particular prior to precipitation occurring the data collected was able to be used to develop water level contours. Therefore, this deviation is considered not to impact on the OMP data set.
Sampling of all OMP groundwater locations.	Monitoring location MW405 was lost (destroyed) and not sampled.	Nearby well, MW215 (the source zone well for FFF1: Source Area 8), located down hydraulic gradient from the lost MW405 was able to be sampled. Given the proximity of MW215 to MW405, the impact of the lack of data from Source Area 7 is considered to be minimised, however there is now a lack of monitoring locations to the northwest of Source Areas 7 and 8. This is discussed further in **Section 8.3.2** and **Section 11.0**.
Sampling of all OMP surface water locations.	Upstream surface water locations SW125, SW156, SW160, SW178, SW181 were dry and not able to be sampled.	Given that these locations were all able to be sampled a minimum of three times during the monitoring period, and an assessment of the surface water conditions was able to be completed. Therefore, this deviation is considered not to impact on the OMP data set.
Collection of inter-laboratory duplicates at a rate of 1:10.	Inter-laboratory duplicates were not collected at a rate of 1:10.	Given that intra-laboratory duplicates were collected at the required frequency and that the reported results were within historical ranges, this deviation is considered not to impact on the OMP data set.

SAQP requirement	Sampling event deviation	Impact of deviation on data set
End of wet season groundwater sampling event March 2022		
Sampling of all OMP groundwater locations.	Samples were collected from 29 of 30 wells, with the following not sampled: • MW215, due to redevelopment construction hindering access • contingency well MW121 was unable to be located (possibly destroyed).	Note that MW215 was the alternate monitoring location for Source Area 7 since the loss of MW405. The lack of access to MW215 further impacts the assessment of potential PFAS movement in the vicinity of Source Area 7 and 8. However the down hydraulic gradient monitoring locations MW103 and MW107 to the southwest minimise the impact of the lack of data in this area, as these wells capture conditions in the direction of the receptors. Given that monitoring of MW215 was able to be completed during subsequent sampling events in September 2022 and March 2023, the impact by this deviation has been minimised.
Sampling SAQP listed groundwater locations.	Sampling of four non-OMP wells (MW451, MW452, MW453 and MW454).	Given that the data from these additional wells were for a separate project, this deviation is considered not to impact on the OMP data set.
All monitoring well gauging to be completed within a 24-hour period.	Gauging of some of the scheduled groundwater wells within a 24-hour period was not possible and was completed over four days due to access restrictions limiting when certain areas could be entered to conduct sampling.	Given that the inferred groundwater level contours generated from the March 2022 monitoring event were consistent with previous monitoring rounds, this deviation is considered not to impact on the OMP data set.
End of wet season surface water sampling event March 2022		
Sampling of all OMP surface water locations.	SW104 was unable to be sampled due to hazardous vegetation preventing access.	Given that there are monitoring locations up and down stream of SW104 and that SW104 was able to be sampled a total of five times during the monitoring period, this deviation is considered not to impact on the OMP data set.

SAQP requirement	Sampling event deviation	Impact of deviation on data set
	SW156 and SW160 were dry during the monitoring event and not sampled.	Given that these locations were able to be sampled three times in subsequent surface water sampling events, this deviation is considered not to impact on the OMP data set.
End of dry season groundwater sampling event September 2022		
Sampling SAQP listed groundwater locations.	Sampling of four non-OMP wells (MW451, MW452, MW453 and MW454).	Given that the data from these additional wells were for a separate project, this deviation is considered not to impact on the OMP data set.
Sampling of all OMP groundwater locations.	MW197, MW240, MW241 and MW453 were dry and unable to be sampled.	No alternate locations were available for these dry locations during this sampling event. Given that MW197, MW240, and MW241 were able to be sampled a minimum of three times each during the monitoring period, the deviation for these wells is considered not to impact on the OMP data set. MW453 was only able to be sampled once during the monitoring period (in March 2023), which has limited the data required for the mass flux study at this location.
	MW115 not sampled, as it was damaged.	Given that the well was repaired and subsequently sampled a total of four times during the monitoring period, this deviation is considered not to impact on the OMP data set.
Dry season 2022 surface water sampling events June, August, and September 2022		
In situ field parameter collection for surface water.	Field parameter data was collected for surface water was collected ex-situ.	Collecting surface water field parameters ex-situ provides comparable results to in situ parameter collection when conducted immediately after the water is collected. Since data collection occurred while sampling was being conducted per location the deviation is considered not to have an impact on the OMP data set.
Start of wet season surface water sampling event November 2022		
Sampling of all OMP surface water locations.	SW152 was inadvertently not sampled.	Given there are monitoring locations up and downstream from SW152 had been sampled, and SW152 was able to be sampled during the March 2023

SAQP requirement	Sampling event deviation	Impact of deviation on data set
		sampling event, this deviation is considered not to impact on the OMP data set.
Sampling of all OMP surface water locations.	An additional location (SW300) was sampled that had not at the time been included in the SAQP.	Given this location is now included in the updated SAQPs, this deviation is considered not to impact on the OMP data set.
Collection of one rinsate and field sample per day.	Rinsate blank and field blank samples not collected at the required rate of one per day.	Although the field blank and field blank samples were only collected at a rate of one per event, given that the sampling methodology and decontamination procedures were appropriate, the potential for cross contamination and impact via atmospheric contamination is low. Therefore, this deviation is considered not to impact on the OMP data set.
Inclusion of one trip blank per cooler for shipment to laboratory.	No trip blank was utilised during the sampling event.	Given that the rinsate and field blanks reported PFAS below LOR, the risk of contamination during transport and storage is considered to be low. Therefore, this deviation is considered not to impact on the OMP data set.
Mid-wet season mass flux surface water sampling event December 2022		
Sampling of all OMP surface water locations.	SW300 was dry and not sampled.	Given that the dry conditions still provide valuable information for the mass flux study, indicating no discharge at this location. Therefore, this deviation is considered not to impact on the OMP data set
Late wet season groundwater sampling event March 2023		
Sampling of all OMP groundwater locations.	MW144 was inadvertently not sampled in March 2023.	Given that the location was re-visited in April 2023 and sampled, the deviation is considered not to impact on the OMP data set. Additionally, a comparison of gauging data from both events showed limited change in groundwater elevation (~0.2 m).
	MW422 was inaccessible and not sampled.	Given that and alternate location, MW235 was sampled, the deviation is considered to have a minor impact on the OMP data set.

SAQP requirement	Sampling event deviation	Impact of deviation on data set
All monitoring well gauging to be completed within a 24-hour period.	Gauging of groundwater wells were not completed within a 24-hour period and was completed over four days due to access restrictions limiting when certain areas could be entered to conduct sampling.	Given that the inferred groundwater level contours generated from the March 2023 monitoring event were consistent with previous monitoring rounds, this deviation is considered not to impact on the OMP data set.

4.0 Quality assurance and quality control

Data validation pertaining to the data in this report has been completed and discussed within the factual reports provided in **Appendix B** and listed below:

- RAAF Base Darwin – Sampling Event Factual Report – 2023 Wet Season (AECOM, 2023b)
- RAAF Base Darwin – Sampling Event Factual Report – 2022 Dry Season (AECOM., 2022b)
- RAAF Base Darwin - Sampling Event Factual Report – November 2021 to March 2022 (AECOM, 2022a)
- RAAF Base Darwin - Sampling Event Factual Report - November 2021 (AECOM, 2021c)
- RAAF Base Darwin - Sampling Event Factual Report - April and May 2021 (AECOM, 2021b)
- RAAF Base Darwin - Sampling Event Factual Report - November 2020 to January 2021 (AECOM, 2021a).

Data validation procedure employed in the assessment of the field and laboratory QA/QC data indicated that the reported analytical results are representative of the sample locations and that the overall quality of the analytical data produced is acceptably reliable for the purpose of the factual and interpretive reports. The following amendments to reported analytical results are noted:

- Analytical results from MW191 and MW209 sampled during the November 2020 monitoring event (Biannual end of dry season) were flagged as being mislabelled following a review of data. For assessment purposes the results from MW191 and MW209 have been reassigned in the database and for assessment in this report.
- MW133 sampled in September 2022 (Biannual end of dry season) was noted to have been collected from a non-OMP well and incorrectly labelled as MW133 within the factual report (AECOM., 2022b). Resampling from the correct well was conducted in October 2022 and the September 2022 data has now been excluded from the database and from assessment.

AECOM considers the data obtained during the current monitoring period, along with the historical data assessed, to be representative of the conditions at the time of monitoring and to be suitable for the temporal assessment of the data at the base.

5.0 Assessment criteria

The adopted screening criteria references the PFAS National Environmental Management Plan 2.0 (NEMP 2.0) (HEPA, 2020), Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. At the time of preparing this report, the primary guidance document utilised is the *PFAS National Environmental Management Plan (version 2.0)* (NEMP) (HEPA, 2020).

The adopted PFAS screening criteria to assess the data collected as part of the monitoring are presented in **Table 5, Table 6** and **Table 7**

These screening criteria included values for the following analytes:

- PFOS
- PFOS+PFHxS
- PFOA.

Table 5 Summary of adopted screening criteria: PFAS water

Pathway	Compound	Criteria	Comment / Reference
Drinking water - groundwater	PFOS+PFHxS	0.07 µg/L	These values are from the PFAS NEMP 2.0 (HEPA, 2020). *All groundwater results were compared to these criteria.*
	PFOA	0.56 µg/L	
Recreational use – surface water	PFOS+PFHxS	2 µg/L	The values presented in the PFAS NEMP 2.0 (HEPA, 2020) are from the Guidance on Per and Polyfluoroalkyl (PFAS) in Recreational Water (NHMRC, 2019) guidance on the assessment of PFAS in recreational water released in August 2019. *All surface water results were compared to these criteria.*
	PFOA	10 µg/L	

Table 6 PFAS criteria summary: ecological

Media	Chemical	Criteria	Comment/Reference
Freshwater (99% species protection values) – groundwater and surface water	PFOS	0.00023 µg/L	These values are from the PFAS NEMP 2.0 (HEPA, 2020). The 99% level of protection has been applied for slightly to moderately disturbed ecosystems. This approach is generally adopted for chemicals that bioaccumulate and biomagnify in wildlife. For the purposes of preliminary screening of analytical water results, the laboratory LOR will be adopted rather than sole use of the criteria value. *All surface water and groundwater results were compared to these criteria.*
	PFOA	19 µg/L	

Table 7 PFAS criteria summary: aquatic biota

Media	Chemical	Criteria	Comment/Reference
Crustaceans	PFOS and PFOS+PFHxS	65 µg/kg	Department of Health (2019) Derivation: Children 2-6 years, median consumption Occasionally consumed food. Trigger criteria for investigation for crustaceans apply to molluscs' hue to the small number of consumers of molluscs.
	PFOA	520 µg/kg	
Finfish	PFOS and PFOS+PFHxS	5.2 µg/kg	Department of Health (2019) Derivation: Children 2-6 years, P90 consumption
	PFOA	41 µg/kg	

6.0 Contextual and ancillary information

6.1 Additional analytical data

Groundwater monitoring has been conducted on-base and surrounding areas in association with on-going PFAS characterisation sampling projects and operational monitoring. These projects include:

- Interim-OMP monitoring (December 2018 to March 2019)
- Detailed site investigation (DSI) (PFAS) (Coffey, 2018a)
- Supplementary DSI (PFAS) (Coffey, 2018b).

Data from these investigations are included in **Appendix C**. Unpublished data collected for other purposes across the base is not included for presentation in this report.

6.2 Remediation projects

The aim of remediation projects is to minimise PFAS leaving the base, by focusing on the remediation and management of source areas. Over time this is anticipated to contribute to the reduction of PFAS in the Management Area, the PMAP sets out the management measures to address soil and water contamination concerns to reduce risks.

At the base, PFAS was found to be primarily moving through surface water, whilst groundwater discharge to Rapid Creek also contributes to some of the PFAS migration off-base. Given that complete prevention of off-base migration is unlikely to be achievable, Defence aims to remediate so far as reasonably practicable (SFARP).

Current remediation projects in progress or scheduled to commence at the base include:

- PMAP Implementation: Soil management planning and systems implementation
  - Optimisation of soil management planning and systems including the development of a Site Spoil Management Plan
- Soil RAP implementation at FFTA1 (Source Area 1):
  - Removal and thermal destruction of PFAS contaminated soils (complete)
  - Excavation of PFAS contaminated soils (complete)
  - Treatment of PFAS contaminated soils and reinstatement of treated soils (commenced with expected completion in late 2023)
  - Installation of capping layer and final profiling of FFTA1 remediation area (expected completion in late 2023)
- Soil RAP implementation at AFFF Contaminated Soil Stockpiles (Source Area 5):
  - Removal and thermal destruction of PFAS contaminated soils (complete)
- Balance of base RAP in development, targeting the following source areas:
  - CFTA (Source Area 11), FFF4 (Source Area 3), FFF6 (Source Area 4), Former ARFF Fire Station (Source Area 9)
- Balance of base remediation investigations in progress
  - Additional soil and concrete samples collected from CFTA (Source Area 11), FFF4 (Source Area 3), FFF6 (Source Area 4) and Former ARFF Fire Station (Source Area 9) to further inform forthcoming RAP and remediation options assessments.
- Interim PFAS management measures implemented at CFTA (Source Area 11) to reduce mass flux from concrete pad, including:
  - Removal of large mockup (LMU) infrastructure. Liaison continuing with DIA regarding remediation planning for FFTA2 (Source Area 10) which is situated on DIA-occupied land.

- Treatment of PFAS-impacted water at an aircraft hangar that was generated by a Class B foam discharge from the foam deluge system. The on-base treatment was undertaken using a portable water treatment facility.
- Commencement of baseline mass flux monitoring of PFAS leaving the base in surface water and groundwater, to inform management efforts and monitor effectiveness of future remediation.

Following completion of the above works, it is estimated that approximately 28 kg of PFAS within soils at Former fire training area 1 and the Wrapped Stockpile Area have been managed by either disposal and destruction at an off-base facility or treated to reduce the leachability of PFAS.

It is anticipated that that overall, due to the works there has been an approximate 75% reduction in the mass of PFAS leaching from the Former fire training area 1 and leaving the base in surface water via Rapid Creek, it is noted that changes within the environment are likely to take time to be demonstrated.

6.3 Infrastructure projects

Development works at the base have included several infrastructure projects during the monitoring period that may have resulted in the disturbance and stockpiling of soil, including (but not limited to):

- ESTO2009 RAAF Darwin Mid Term Refresh
- P0009 Runway works. Including the planned remediation (excavation and stabilisation) of approximately 12,000 ton of PFAS impacted soils from the Runway 29 overshoot drain on the east of the base
- P923 – Aircraft Parking Apron
- P700 – KC-10 Operational Facility
- P941 – Maintenance Support Facility
- P949 – Aircraft Maintenance Hangar
- RAAF Base Darwin Stormwater works
- PAF-160600 – Bulk Fuel Storage Tanks
- AIR 7000 Pk4 Hardstand, Pk1 Hangar, and Fuel Line Tie in works
- Solar Farm works.

On-base infrastructure projects listed all include some movement of soils and / or changes in existing infrastructure. All works completed on-base are required to conduct works in accordance with the Defence PFAS Construction and Maintenance Framework (Defence, 2021), and therefore impacts from infrastructure projects are not anticipated. Groundwater and surface water data collected over the reporting period do not suggest that base infrastructure projects have had significant impact on PFAS concentrations in surface water or groundwater.

AECOM is not aware of any practices or recent incidents which are likely to influence the nature or extent of PFAS at the base. Assessment of Runway 29 overshoot drain remediation works will be covered in **Section 8.3.6**.

6.4 Significant weather events

The monitoring period between November 2020 and June 2023 was characterised by above average temperatures in 2021 and 2022, and an early start to the 2022-2023 wet season.

Temperatures exceeded the long-term average for majority of 2021 and 2022, returning to the long-term average in 2023 (**Figure 1** below). This is consistent with a drier first half of 2022 with below average rainfall, and consistent water levels for 2023.

Monthly rainfall during the monitoring period was generally consistent with the long-term average for the months of April to September, and well below average for March. Monthly total rainfall during the months of October to February varied across the monitoring period, whilst December greatly exceeded the long-term average (**Figure 2** below).

The water levels recorded from Rapid Creek at McMillan's Drive (Station ID G8150127) throughout the monitoring period are largely consistent with cyclical wet and dry seasons in the area (**Figure 3** below). March to May experienced average to below average rainfall throughout the monitoring period, as consistent with the Rapid Creek water levels for this period. The average water levels for these months have been slowly increasing over time (1.150 m in 2020 to 1.192 m in 2023), which varies inconsistently to the monthly rainfall recorded in the area.

Excluding the 2022-2023 wet season, where wet season rains arrived early, the wettest month during the monitoring period occurred in January 2021. This corresponded to a maximum water level measurement at Rapid Creek of 3.000 m in January 2021.

Surface water sampling (on-base and off-base) occurs twice in the wet season. The first event typically occurs in December/January targeting as soon as practicable after the start of the higher rainfall

periods, as the end of dry season / start of wet season is normally characterised by spikes in surface water concentrations (often referred to as “first-flush” sampling).

The second sampling event occurs at the end of the wet season in March. Above average rainfall was recorded from October to December 2022 (which was reflected in an early and peak water level at Rapid Creek), which would function as the first-flush event.

This period was followed by a drier than average January 2023 and a resultant below average water level (0.5 m lower than January 2022). As the first-flush rainfall events were earlier than anticipated and inconsistent with the long-term average, the targeted surface water sampling event was slightly later than intended, being undertaken in November 2022, and as a result the sampling may not have captured the first-flush concentration peak. This should be noted when reviewing concentration trends in **Section 8.5** where results do not align with the expected trend.

The cyclical nature of the wet and dry seasons at the base may result in variability to the hydrogeological system and the data collected, including changes to water levels and other characteristics associated with groundwater and surface water including flow and gradient.

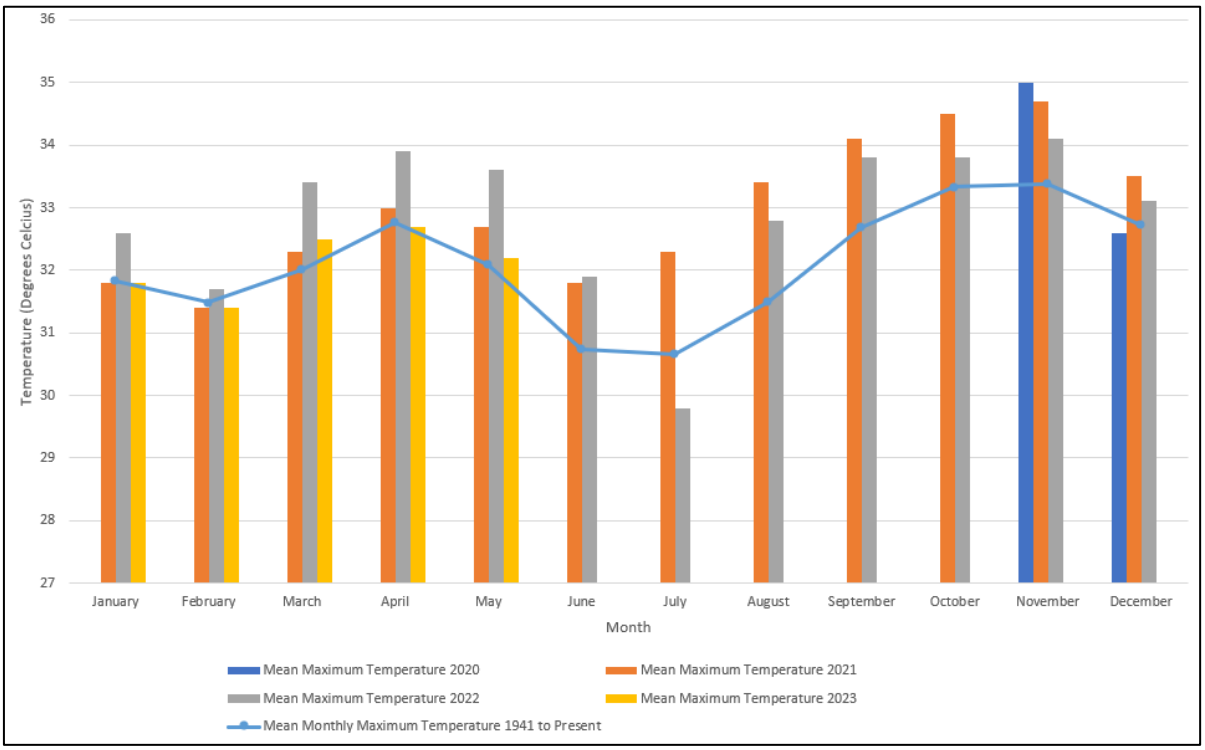


Figure 1 Mean maximum temperature (monitoring period) vs. mean maximum temperature (1941 to present)

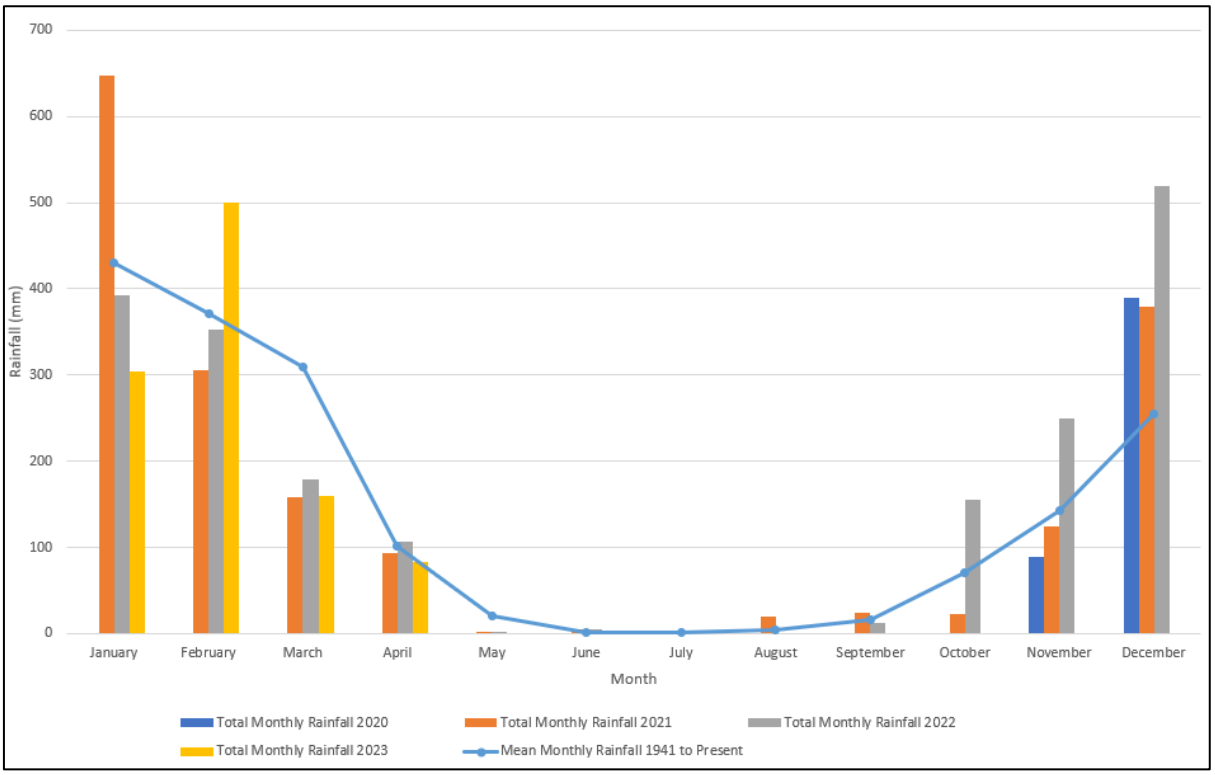


Figure 2 Total monthly rainfall (monitoring period) vs. mean monthly rainfall (1941 to present)

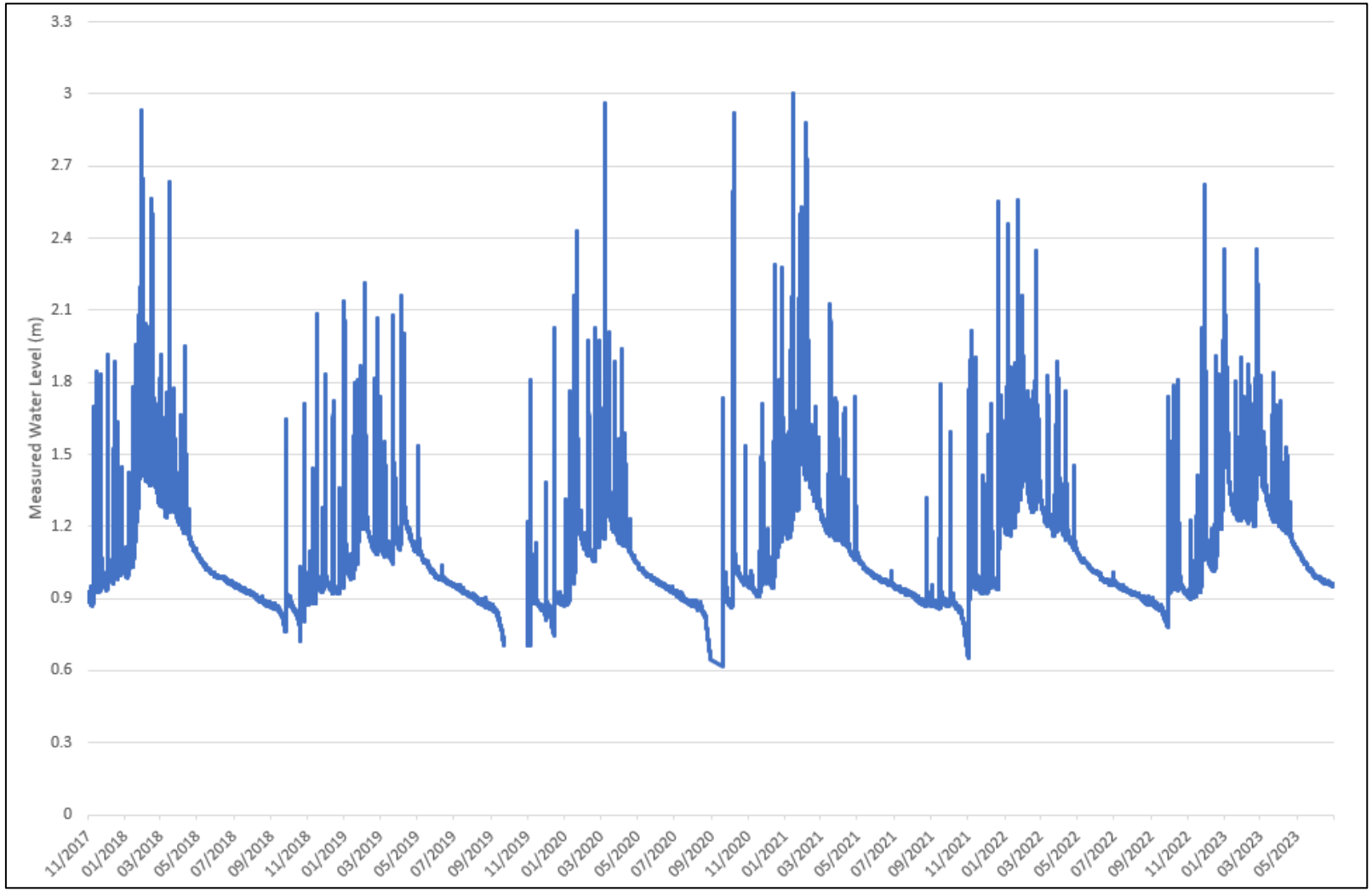


Figure 3 Rapid Creek water level (downstream at McMillan's Road - Station ID G8150127) November 2017 to June 2023

7.0 Monitoring data summary

As part of the OMP, as detailed in **Section 1.2** the following 22 sampling events were completed by AECOM across the monitoring period:

- November 2020 to January 2021 (AECOM, 2021a)
  - Groundwater sampling between 2 and 4 November 2020
  - Biota sampling between 3 and 12 November 2020
  - Surface water sampling between 16 and 18 December 2020
  - Targeted surface water sampling on 20 January 2021.
- April and May 2021 (AECOM, 2021b)
  - Groundwater sampling between 28 and 29 April 2021, and 6 May 2021
  - Surface water sampling between 28 and 29 April 2021 and 6 May 2021.
- November 2021 (AECOM, 2021c)
  - Groundwater sampling between 9 and 11 November 2021.
- November 2021 – March 2022 (AECOM, 2022a)
  - Biota sampling between 8 November and 3 December 2021
  - Surface water sampling between 13 and 17 January 2022
  - Groundwater sampling between 7 and 10 March 2022
  - Surface water sampling between 14 and 16 March 2022.
- 2022 Dry Season (AECOM., 2022b)
  - Targeted surface water sampling between 30 June and 26 August 2022
  - Groundwater sampling between 28 and 29 September, and between 10 and 21 October 2022.
- 2023 Wet Season (AECOM, 2023b)
  - Biota sampling between 25 and 31 October 2022
  - Surface water sampling between 23 and 25 November 2022
  - Targeted surface water sampling on 22 December 2022
  - Targeted surface water sampling on 25 January 2023
  - Targeted surface water sampling on 21 February 2023
  - Groundwater sampling between 13 and 29 March 2023
  - Targeted surface water sampling between 27 and 28 March 2023
  - Surface water sampling between 27 and 28 March 2023
  - Targeted surface water sampling on 14 April 2023.

The sample locations are shown on **Figure F3** (**Appendix A**). The results are summarised in following sections and on figure series **Figure F4** and **Figure F5** (**Appendix A**) and in **Table T1** to **Table T5** (**Appendix C**).

The groundwater elevations are shown on figure series **Figure F2** (**Appendix A**).

7.1 Groundwater

7.1.1 Groundwater field observations

The field observations during groundwater sampling, including groundwater elevation and parameters are provided in **Table T1** in **Appendix C.**

Note that as at the completion of the most recent groundwater monitoring event (AECOM, 2023b), all scheduled groundwater monitoring locations were able to be sampled with the exception of MW422, which was located within a restricted construction area, however the contingency well, MW235 for MW422 was able to be sampled.

Groundwater observations for the monitoring period were recorded to generally be clear to moderately turbid, colourless to light grey or brown colour, and mostly without odour or sheens with the exception of the following:

- Hydrocarbon odour at:
  - MW133, MW297, MW303, and MW210.
- Organic or hydrogen sulphide odour at:
  - MW107, MW115, MW144, MW148, MW156, MW193, MW195, MW197, MW200, MW205, MW209, MW210, and MW241.
- Sheen or measurable non-aqueous phase liquids at:
  - MW297 and MW303.

7.1.2 Groundwater elevation

The standing water level (SWL) was measured, where possible, across all scheduled wells to evaluate the groundwater elevations (GWE) in metres Australian Height Datum (mAHD) within the Management Area.

The gauging frequency varied through the monitoring period, however, was generally completed biannually during the transitional periods between dry and wet seasons and between the wet and dry seasons.

The gauging results are presented on **Table T1** (**Appendix C**) and results from the six biannual groundwater sampling events undertaken during the monitoring period are summarised in **Table 8** (for on-Site locations) and **Table 9** (for off-Site locations) below.

Table 8 Summary of groundwater elevations – on-base

Event	No. Wells	Min. SWL (mbtoc)	Max. SWL (mbtoc)	Min. GWE (mAHD)	Max. GWE (mAHD)
Biannual end of dry season 2 - 4 Nov 2020	16	2.320 (MW128)	11.969 (MW241)	9.070 (MW128)	24.100 (MW115)
End of wet season 28 - 29 Apr & 6 May 2021	17	2.220 (MW128)	8.434 (MW144)	9.170 (MW128)	27.290 (MW115)
Biannual end of dry season 9 - 11 Nov 2021	16	2.270 (MW128)	12.628 (MW303)	3.028 (MW201)	25.700 (MW115)
Biannual end of wet season 7 - 10 Mar 2022	17	1.582 (MW156)	6.555 (MW144)	9.595 (MW128)	29.092 (MW115)
Biannual end of dry season	22	2.130 (MW128)	13.151 (MW133)	8.108 (MW451)	22.167 (MW115)

Event	No. Wells	Min. SWL (mbtoc)	Max. SWL (mbtoc)	Min. GWE (mAHD)	Max. GWE (mAHD)
28 - 29 Sep, & 10 & 21 Oct 2022					
Biannual end of wet season 13 & 29 Mar 2023	22	1.510 (MW156)	6.800 (MW144)	9.390 (MW452)	28.657 (MW115)

Notes:
mbtoc = m below top of casing
mAHD = m Australian Height datum
SWL = Standing water level
GWE = Groundwater elevation

Table 9 Summary of groundwater elevations – off-base

Event	No. Wells	Min. SWL (mbtoc)	Max. SWL (mbtoc)	Min. GWE (mAHD)	Max. GWE (mAHD)
Biannual end of dry season 2 - 4 Nov 2020	12	1.657 (MW209)	11.612 (MW197)	3.436 (MW185)	20.430 (MW200)
End of wet season 28 - 29 Apr & 6 May 2021	12	1.384 (MW209)	7.097 (MW180)	3.696 (MW185)	21.963 (MW180)
Biannual end of dry season 9 - 11 Nov 2021	12	1.779 (MW190)	13.225 (MW197)	3.025 (MW185)	19.729 (MW200)
Biannual end of wet season 7 - 10 Mar 2022	12	0.885 (MW209)	4.124 (MW200)	4.632 (MW185)	25.238 (MW180)
Biannual end of dry season 28 - 29 Sep, & 10 & 21 Oct 2022	12	1.970 (MW190)	12.270 (MW180)	2.583 (MW185)	19.483 (MW200)
Biannual end of wet season 13 & 29 Mar 2023	12	1.160 (MW209)	4.340 (MW141)	4.253 (MW185)	25.206 (MW180)

Notes:
mbtoc = m below top of casing
mAHD = m Australian Height datum
SWL = Standing water level
GWE = Groundwater elevation

7.1.3 Groundwater flow directions

Groundwater elevation data are tabulated in **Table T1 (Appendix C)**. Groundwater elevations and interpreted contours for the six results from the six biannual groundwater sampling events undertaken during the monitoring period are presented in **Figure F2a to Figure F2g (Appendix A**).

The groundwater elevation and interpreted contour figures indicate that the groundwater elevated is highest at the centre of the base (south of the main runway), and the groundwater flow direction radiates from this location, flowing in an arc from north to west towards Rapid Creek and Ludmilla Creek respectively. Based on the monitoring in November 2021, it was also observed that the groundwater to the south of the base flows towards the Charles Darwin National Park and Francis Bay (**Figure F2c Appendix A**).

Note that groundwater flow directions have been generally consistent with the previous monitoring events completed since 2020.

7.1.4 Groundwater quality parameter field measurements results

During each sampling event, groundwater quality field measurements were recorded ex-situ, after collecting groundwater samples. Parameters are presented in each of the respective factual reports in **Appendix B** and tabulated in **Table T1 (Appendix C)**.

The maximum and minimum recorded field parameters for the monitoring period are provided in **Table 10** and **Table 11** below. Note that the maximum and minimum recorded field parameters for the period preceding the monitoring period have also been included for comparison purposes.

Overall, the groundwater quality field measurements for the monitoring period are generally consistent with historical data, as six of 41 monitoring locations recorded no single parameters outside of the historical observation range.

Table 10 Groundwater quality parameter ranges (min – max) – on-base

Event	No. of samples	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH	Corrected redox (mV)	Temperature (°C)
Historical (Apr 2017 to April 2020)	123	0 (MW185) – 13.4 (MW103). *Poor to well oxygenated conditions*	23.5 (MW141) – 50,600 (MW297) *Freshwater to saline conditions*	3.57 (MW240) – 6.25 (MW210) *Acidic to slightly acidic conditions*	90.6 (MW303) - 562.9 (MW112) *Oxidising conditions*	28.49 (MW205) - 35.61 (MW156
Biannual end of dry season 2 - 4 Nov 2020	17	0.22 (MW107) - 3.62 (MW141) *Poor to oxygenated conditions*	36.7 (MW112) - 388.5 (MW303) *Freshwater conditions*	3.98 (MW128) - 5.75 (MW303 *Acidic to slightly acidic conditions*	158.2 (MW303) - 482.7 (MW240 *Oxidising conditions*	29.8 (MW156) - 32.6 (MW240)
End of wet season 28 - 29 Apr & 6 May 2021	17	0.36 (MW303) - 3.71 (MW115) *Poor to oxygenated conditions*	37.5 (MW205) - 333.4 (MW303) *Freshwater conditions*	4.51 (MW205) - 7.28 (MW115) *Acidic to neutral conditions*	142.9 (MW303) - 486.5 (MW139) *Oxidising conditions*	30.1 (MW141) - 33.1 (MW148)
Biannual end of dry season 9 - 11 Nov 2021	16	0.44 (MW107) - 3.84 (MW115) *Poor to oxygenated conditions*	29.7 (MW112) - 63307 (MW201) *Freshwater to saline conditions*	3.94 (MW201) - 8.6 (MW115) *Acidic to mildly basic conditions*	189.1 (MW303) - 500 (MW139) *Oxidising conditions*	30.3 (MW176) - 33.1 (MW148)
Biannual end of wet season 7 - 10 Mar 2022	17	1.44 (MW133) - 4.65 (MW112) *Oxygenated conditions*	37.8 (MW156) -55572 (MW201) *Freshwater to saline conditions*	4.05 (MW115) - 6.4 (MW303) *Acidic to slightly acidic conditions*	211.11 (MW201) - 379.9 (MW297) *Oxidising conditions*	30.2 (MW156) - 32.7 (MW133)
Biannual end of dry season 28 - 29 Sep, & 10 & 21 Oct 2022	22	0.53 (MW176) - 2.39 (MW205) *Poor to oxygenated conditions*	35.3 (MW139) -330.4 (MW303) *Freshwater conditions*	4.09 (MW128) - 7.09 (MW133) *Acidic to neutral conditions*	171.3 (MW303) - 421 (MW454) *Oxidising conditions*	27.1 (MW133) - 32.3 (MW103)
Biannual end of wet season 13 & 29 Mar 2023	21	0.73 (MW141) - 4.21 (MW240) *Relatively poor to oxygenated conditions*	30.7 (MW240) - 544 (MW139) *Freshwater conditions*	3.87 (MW235) - 5.89 (MW112) *Acidic to neutral conditions*	130.8 (MW241) - 314 (MW215) *Oxidising conditions*	29.3 (MW107) - 33.7 (MW133)

Table 11 Groundwater field parameter ranges (min – max) – off-base

Event	No. of samples	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH	Corrected redox (mV)	Temperature (°C)
Historical (Apr 2017 to April 2020)	71	0 (MW185 - 16 (MW210) *Poor to well oxygenated conditions*	26.5 (MW194) - 1964.7 (MW211) *Freshwater to brackish conditions*	3.61 (MW197) -6.95 (MW195) *Acidic to neutral conditions*	138.9 (MW176) - 554.7 (MW211) *Oxidising conditions*	27.78 (MW195) - 35.19 (MW197)
Biannual end of dry season 2 - 4 Nov 2020	12	0.53 (MW176) - 5.16 (MW180) *Poor to oxygenated conditions*	55.6 (MW200) - 1342 (MW209) *Freshwater to brackish conditions*	4.67 (MW128) - 6.18 (MW194) *Acidic to slightly acidic conditions*	234.9 (MW210) - 446.1 (MW180) *Oxidising conditions*	30.6 (MW115) - 33.4 (MW180
End of wet season 28 - 29 Apr & 6 May 2021	12	0.49 (MW197) - 3.51 (MW180) *Poor to oxygenated conditions*	33.6 (MW211) - 1936 (MW185) *Freshwater to brackish conditions*	4.89 (MW197) - 7.77 (MW185) *Acidic to slightly basic conditions*	207.2 (MW210) - 449.8 (MW180) *Oxidising conditions*	27.6 (MW195) - 33 (MW191)
Biannual end of dry season 9 - 11 Nov 2021	12	0.81 (MW194) - 3.51 (MW180) *Relatively poor to oxygenated conditions*	23.6 (MW194) - 2206 (MW211) *Freshwater to brackish conditions*	4.04 (MW195) -6.65 (MW197) *Acidic to neutral conditions*	300.6 (MW209) - 488.8 (MW180) *Oxidising conditions*	30.8 (MW176) - 34 (MW210)
Biannual end of wet season 7 - 10 Mar 2022	12	1.5 (MW144) - 5.2 (MW180) *Relatively poor to oxygenated conditions*	42.9 (MW194) - 1450 (MW209) *Freshwater to brackish conditions*	4.66 (MW200) - 5.9 (MW210) *Acidic to slightly acidic conditions*	240 (MW197) - 364.9 (MW191) *Oxidising conditions*	29.6 (MW197) - 33.2 (MW180)
Biannual end of dry season 28 - 29 Sep, & 10 & 21 Oct 2022	12	0.94 (MW185) - 2.5 (MW210) *Relatively poor to oxygenated conditions*	33.5 (MW194) - 1451 (MW209) *Freshwater to brackish conditions*	4.4 (MW180) -6.07 (MW211) *Acidic to slightly acidic conditions*	320.1 (MW210) - 373.8 (MW185) *Oxidising conditions*	27.8 (MW211) - 32.7 (MW133)

Event	No. of samples	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH	Corrected redox (mV)	Temperature (°C)
Biannual end of wet season 13 & 29 Mar 2023	12	0.73 (MW141) - 4.38 (MW200) *Relatively poor to oxygenated conditions*	31.9 (MW211) - 298.7 (MW210) *Freshwater conditions*	4.42 (MW200) - 6.2 (MW210) *Acidic to slightly acidic conditions*	220.5 (MW195) - 314.1 (MW200) *Oxidising conditions*	29.1 (MW197) - 31.7 (MW128)

7.1.5 Groundwater PFAS analytical results

All groundwater analytical results for each sampling event conducted in monitoring period are presented in historical groundwater analytical results **Table T2 (Appendix C**). The monitoring locations are presented in **Figure F3** (**Appendix A**).

Groundwater monitoring analytical results for both on- and off-base wells for PFOS, PFOA and PFOS+PFHxS are summarised in **Table 12** and **Table 13** below and presented on concentration maps in figure series **Figure F4 (Appendix A)**.

The groundwater analytical results for the monitoring of source areas and downgradient and cross gradient plume monitoring are summarised in **Section 8.1**.

Deviations from historical groundwater dataset are summarised in **Table 14**.

Table 12 Summary of PFOS, PFOA and PFOS+PFHxS concentrations in groundwater – on-base

Sampling Event	No. of Samples[1]	Compound	Concentration Range in Sampling Event	No. of Samples[1] with Concentration > LOR	No. of Exceedances of Human Health Criteria	No. of Exceedances of Ecological Criteria*
On-base monitoring locations						
Biannual end of dry season 2 - 4 Nov 2020	18	PFOA	0.02 µg/L (MW205) to 8.4 µg/L (MW240)	16	7	0
		PFOS	0.26 µg/L (MW141) to 269 µg/L (MW115)	18	NA	18
		PFOS+PFHxS	0.45 µg/L (MW141) to 309 µg/L (MW115)	18	18	NA
End of wet season 28 - 29 Apr & 6 May 2021	18	PFOA	0.01 µg/L (MW139) to 4.41 µg/L (MW240)	16	5	0
		PFOS	0.11 µg/L (MW141) to 80.5 µg/L (MW115)	18	NA	18
		PFOS+PFHxS	0.3 µg/L (MW141) to 110 µg/L (MW115)	18	18	NA
Biannual end of dry season 9 - 11 Nov 2021	20	PFOA	0.03 µg/L (MW139) to 3.34 µg/L (MW303)	18	6	0
		PFOS	0.07 µg/L (MW201) to 62.2 µg/L (MW115)	20	NA	20
		PFOS+PFHxS	0.08 µg/L (MW201) to 95.6 µg/L (MW303)	20	20	NA
Biannual end of wet season 7 - 10 Mar 2022	23	PFOA	0.02 µg/L (MW297) to 12.5 µg/L (MW422)	19	8	0
		PFOS	0.01 µg/L (MW201) to 93.3 µg/L (MW422)	23	NA	23
		PFOS+PFHxS	0.02 µg/L (MW201) to 328 µg/L (MW422)	23	22	NA
Biannual end of dry season 28 - 29 Sep, & 10 & 21 Oct 2022	18	PFOA	0.01 µg/L (MW205) to 3 µg/L (MW303)	16	5	0
		PFOS	0.02 ug/l (MW451) to 49.9 ug/l (MW303)	18	NA	18
		PFOS+PFHxS	0.02 ug/l (MW451) to 81.3 ug/l (MW303)	18	17	NA
	25	PFOA	0.04 µg/L (MW451) to 3.42 µg/L (MW453)	23	10	0

Sampling Event	No. of Samples[1]	Compound	Concentration Range in Sampling Event	No. of Samples[1] with Concentration > LOR	No. of Exceedances of Human Health Criteria	No. of Exceedances of Ecological Criteria*
On-base monitoring locations						
Biannual end of wet season 13 & 29 Mar 2023		PFOS	1.54 µg/L (MW451) to 47.3 µg/L (MW115)	25	NA	25
		PFOS+PFHxS	2.38 µg/L (MW451) to 63.6 µg/L (MW115)	25	25	NA

***** Denotes that some samples may exceed the Freshwater 99% Species Protection Guideline (HEPA 2020) due to the Limit of Reporting being greater than the Guideline Criteria.
NA = Not applicable (no applicable guideline)
1 Denotes that count of all samples (primary and duplicates).
Human health criteria for groundwater denotes drinking water – groundwater (PFAS NEMP 2.0 (HEPA, 2020)).
Ecological criteria for groundwater denotes Freshwater (99% species protection values) (PFAS NEMP 2.0 (HEPA, 2020)).

Table 13 Summary of PFOS, PFOA and PFOS+PFHxS concentrations in groundwater – off-base

Sampling Event	No. of Samples[1]	Compound	Concentration Range in Sampling Event	No. of Samples[1] with Concentration > LOR	No. of Exceedances of Human Health Criteria	No. of Exceedances of Ecological Criteria
Off-base monitoring locations						
Biannual end of dry season 2 - 4 Nov 2020	12	PFOA	0.01 µg/L (MW193) to 0.3 µg/L (MW197)	7	0	0
		PFOS	0.08 µg/L (MW176) to 18.3 µg/L (MW197)	10	NA	12
		PFOS+PFHxS	0.05 µg/L (MW180) to 23.2 µg/L (MW197)	11	10	NA
End of wet season 28 - 29 Apr & 6 May 2021	12	PFOA	0.01 µg/L (MW209) to 0.15 µg/L (MW197)	6	0	0
		PFOS	0.02 µg/L (MW209) to 5.66 µg/L (MW197)	11	NA	12
		PFOS+PFHxS	0.02 µg/L (MW209) to 8.84 µg/L (MW197)	12	9	NA
Biannual end of dry season 9 - 11 Nov 2021	14	PFOA	0.01 µg/L (MW185) to 0.16 µg/L (MW197)	8	0	0
		PFOS	0.01 µg/L (MW180) to 6.68 µg/L (MW197)	13	NA	14
		PFOS+PFHxS	0.08 µg/L (MW180) to 9.61 µg/L (MW197)	13	13	NA
Biannual end of wet season 7 - 10 Mar 2022	12	PFOA	0.02 µg/L (MW210) to 0.12 µg/L (MW197)	4	0	0
		PFOS	0.02 µg/L (MW190) to 4.9 µg/L (MW197)	9	NA	12
		PFOS+PFHxS	0.02 µg/L (MW185) to 7.48 µg/L (MW197)	11	9	NA
Biannual end of dry season 28 - 29 Sep, & 10 & 21 Oct 2022	11	PFOA	0.01 µg/L (multiple) to 0.08 µg/L (multiple)	8	0	0
		PFOS	0.02 µg/L (MW211) to 2.78 µg/L (MW190)	10	NA	11
		PFOS+PFHxS	0.03 µg/L (MW211) to 4.39 µg/L (MW190)	10	9	NA
Biannual end of wet season 13 & 29 Mar 2023	16	PFOA	0.01 µg/L (MW190) to 0.12 µg/L (MW197)	6	0	0
		PFOS	0.01 µg/L (MW180) to 4.89 µg/L (MW197)	14	NA	16
		PFOS+PFHxS	0.04 µg/L (MW211) to 7.2 µg/L (MW197)	15	12	NA

***** Denotes that some samples may exceed the Freshwater 99% Species Protection Guideline (HEPA 2020) due to the Limit of Reporting being greater than the Guideline Criteria.
NA = Not applicable (no applicable guideline)
1 Denotes that count of all samples (primary and duplicates).
Human health criteria for groundwater denotes drinking water – groundwater (PFAS NEMP 2.0 (HEPA, 2020)).
Ecological criteria for groundwater denotes Freshwater (99% species protection values) (PFAS NEMP 2.0 (HEPA, 2020)).

Table 14 Deviations from historical groundwater dataset

Compounds	First-time detections	New exceedances of ecological criteria[1]	New exceedances of human health criteria	New minimums	New maximums
PFOS	MW201 (0.07 ug/L in Nov 2021) MW235 (16.5 ug/L in Sep 2022) MW451 (0.02 ug/L in Sep 2022) MW452 (2.72 ug/L in Sep 2022) MW453 (5.26 ug/L in Mar 2023) MW454 (28 ug/L in Sep 2022)	MW201 (0.07 ug/L in Nov 2021) MW235 (16.5 ug/L in Sep 2022) MW451 (0.02 ug/L in Sep 2022) MW452 (2.72 ug/L in Sep 2022) MW453 (5.26 ug/L in Mar 2023) MW454 (28 ug/L in Sep 2022)	No criteria available	MW107 (5.4 ug/L in Mar 2022 from 6.1 ug/L in Mar 2018) MW112 (6.42 ug/L in Mar 2023 from 6.6 ug/L in Mar 2019) MW115 (47.6 ug/L in Mar 2023 from 52 ug/L in Mar 2018) MW128 (3.56 ug/L in May 2021 from 5.2 ug/L in Mar 2019) MW133 (11.5 ug/L in May 2021 from 34 ug/L in Mar 2019) MW139 (*0.27 ug/L in Mar 2022 from 0.42 ug/L in Mar 2019) MW144 (1.16 ug/L in Mar 2022 from 1.6 ug/L in Mar 2018) MW148 (3.57 ug/L in May 2021 from 4.5 ug/L in Aug 2017) MW156 (0.35 ug/L in Nov 2020 from 0.48 ug/L in Apr 2020) MW176 (0.05 ug/L in Apr 2021from 0.07 ug/L in Mar 2019) MW190 (0.02 ug/L in Mar 2022 from 0.74 ug/L in Mar 2018) MW191 (1.13 µg/L in Apr 2021 from 1.17 ug/L in Apr 2020) MW193 (0.1 ug/L in May 2021 from 0.71 ug/L in Mar 2018) MW194 (1.83 ug/L in May 2021 from 2.09 ug/L in Dec 2019) MW195 (0.06 ug/L in May 2021 from 0.07 ug/L in Dec 2019) MW200 (0.36 ug/L Mar 2022 from 0.4 ug/L Mar 2018)	MW103 (33.2 ug/L in Nov 2021 from 17.5 ug/L in Dec 2019) MW141 (0.26 ug/L in Nov 2020 from 0.19 ug/L in Dec 2018) MW185 (0.26 ug/L in Nov 2020 from 0.23 ug/L in Dec 2018) MW197 (18.3 ug/L in Nov 2020 from 9.2 ug/L in Dec 2018) MW201 (0.07 ug/L in Nov 2021, not sampled prior to monitoring period) MW235 (25.6 ug/L in Mar 2023, not sampled prior to monitoring period) MW422 (93.3 ug/L in Mar 2022 from 51.6 ug/L in Apr 2020) MW451 (1.54 ug/L in Mar 2023, not sampled prior to monitoring period) MW452 (2.91 ug/L, not sampled prior to monitoring period) MW453 (5.26 ug/L in Mar 2023, not sampled prior to monitoring period)

Compounds	First-time detections	New exceedances of ecological criteria[1]	New exceedances of human health criteria	New minimums	New maximums
				MW201 (0.01 ug/L in Mar 2022, not sampled prior to monitoring period) MW210 (0.82 ug/L in Mar 2022 from 1.1 ug/L in Mar 2022) MW235 (16.5 ug/L in Sep 2022, not sampled prior to monitoring period) MW240 (17.8 ug/L in Mar 2023 from 18 ug/L in Mar 2019) MW241 (6.26 ug/L in Apr 2021 from 8.44 ug/L in Apr 2020) MW297 (1.07 ug/L in Mar 2022 from 4.7 ug/L in Mar 2019) MW451 (0.02 ug/L in Sep 2022, not sampled prior to monitoring period) MW452 (2.72 ug/L in Sep 2022, not sampled prior to monitoring period) MW453 (5.26 ug/L in Mar 2023, not sampled prior to monitoring period) MW454 (28.0 ug/L in Sep 2022, not sampled prior to monitoring period)	MW454 (28.2 ug/L in Mar 2023, not sampled prior to monitoring period)
PFOA	MW176 (0.01 ug/L in Sep 2022) MW209 (0.01 ug/L in Apr 2021) MW235 (0.48 ug/L in Sep 2022) MW451 (0.04 ug/L in Mar 2023)	N/A	MW453 (3.42 ug/L in Mar 2023) MW454 (0.81 ug/L in Sep 2022)	MW115 (1.14 ug/L in Mar 2023 from 1.3 ug/L in Mar 2018) MW128 (0.1 ug/L in Mar 2022 from 0.12 ug/L in Dec 2018) MW133 (0.27 ug/L in May 2021 from 0.53 ug/L in Mar 2019) MW190 (LOR** in Mar 2022 from 0.01 ug/L in Mar 2018) MW 193 (LOR** in May 2021 from 0.01 ug/L in Mar 2018) MW201 (LOR** in Nov 2021, not sampled prior to monitoring period) MW235 (0.48 ug/L in Sep 2022, not sampled prior to monitoring period)	MW103 (1.11 ug/L in Sep 2022 from 0.31 ug/L in Aug 2017) MW176 (0.01 ug/L in Sep 2022 from LOR** in Sep 2017) MW197 (0.3 ug/L in Nov 2020 from 0.18 ug/L in Apr 2020) MW201 (LOR** in November 2021, not sampled prior to monitoring period)

Compounds	First-time detections	New exceedances of ecological criteria[1]	New exceedances of human health criteria	New minimums	New maximums
	MW452 (0.04 ug/L in Sep 2022) MW453 (3.42 ug/L in Mar 2023) MW454 (0.81 ug/L in Sep 2022)			MW240 (2.85 ug/L in Mar 2023 from 3.1 ug/L in Mar 2019) MW292 (0.87 ug/L in Nov 2020 from 0.89 ug/L in Apr 2020) MW297 (0.02 ug/L in Mar 2022 from 0.11 ug/L in Mar 2019) MW303 (0.84 ug/L in Mar 2022 from 0.87 ug/L in Mar 2019) MW451 (LOR** in Sep 2022, not sampled prior to monitoring period) MW452 (0.04 ug/L in Sep 2022, not sampled prior to monitoring period) MW453 (3.42 ug/L in Mar 2023, not sampled prior to monitoring period) MW454 (0.59 ug/L in Mar 2023, not sampled prior to monitoring period)	MW209 (0.01 ug/L in Apr 2021 from LOR** since Nov 2017) MW235 (0.48 ug/L in Sep 2022, not sampled prior to monitoring period) MW422 (12.5 ug/L in Mar 2022 from 1.51 ug/L in Apr 2020) MW451 (LOR** in Sep 2022, not sampled prior to monitoring period) MW452 (0.09 ug/L in Mar 2023, not sampled prior to monitoring period) MW453 (3.42 ug/L in Mar 2023, not sampled prior to monitoring period) MW454 (0.81 ug/L in Sep 2022, not sampled prior to monitoring period)
PFOS+PFHxS	MW201 (0.08 ug/L in Nov 2021) MW235 (22.7 ug/L in Sep 2022) MW451 (0.02 ug/L in Sep 2022)	No criteria available	MW201 (0.08 ug/L in Nov 2021) MW235 (22.7 ug/L in Sep 2022) MW451 (2.38 ug/L in Mar 2023) MW452 (4.33 ug/L in Sep 2022) MW453 (12.6 ug/L in Mar 2023)	MW107 (8.46 ug/L in Mar 2022 from 8.8 ug/L in Mar 2018) MW112 (8.23 ug/L in Mar 2023 from 8.5 ug/L in Mar 2019) MW115 (64.5 ug/L in Mar 2023 from 68 ug/L in Mar 2018) MW128 (5.52 ug/L in Mar 2023 from 7.9 ug/L in Mar 2018) MW133 (14.8 ug/L in May 2021 from 39.8 ug/L in Mar 2019)	MW103 (48.6 ug/L in Sep 2022 from 21.7 ug/L in Dec 2019) MW141 (0.45 ug/L in Nov 2020 from 0.4 ug/L in Dec 2018) MW197 (23.2 ug/L in Nov 2020 from 12.4 ug/L in Dec 2018)

Compounds	First-time detections	New exceedances of ecological criteria[1]	New exceedances of human health criteria	New minimums	New maximums
	MW452 (4.33 ug/L in Sep 2022) MW453 (12.6 ug/L in Mar 2023) MW454 (43.2 ug/L in Sep 2022)		MW454 (43.2 ug/L in Sep 2022)	MW139 (0.41 ug/L in Mar 2022 from 0.56 ug/L in Mar 2019) MW144 (2.15 ug/L in Mar 2022 from 2.55 ug/L in Mar 2018) MW148 (6.45 ug/L in May 2021 from 6.94 ug/L in Dec 2019) MW156 (0.47 ug/L in Nov 2020 from 0.58 ug/L in Apr 2020) MW176 (0.08 ug/L in Apr 2021 from 0.1 ug/L in Mar 2019) MW190 (0.03 ug/L in Mar 2022 from 0.99 ug/L in Mar 2018) MW193 (0.13 ug/L in May 2021 from 0.94 ug/L in Mar 2018) MW194 (2.6 ug/L in May 2021 from 2.96 ug/L in Dec 2019) MW195 (0.09 ug/L in May 2021 from 0.11 ug/L in Dec 2019) MW200 (0.61 ug/L in Mar 2022 from 0.62 ug/L in Mar 2018) MW201 (0.02 ug/L in Mar 2022, not sampled prior to monitoring period) MW210 (1.32 ug/L in Mar 2022 from 1.52 ug/L in Mar 2018) MW235 (22.7 ug/L in Sep 2022, not sampled prior to monitoring period) MW241 (9.2 ug/L in Apr 2021 from 11.1 ug/L in Apr 2020) MW297 (1.44 ug/L in Mar 2022 from 5.8 ug/L in Mar 2019) MW451 (0.02 ug/L in Sep 2022, not sampled prior to monitoring period) MW452 (4.33 ug/L in Sep 2022, not sampled prior to monitoring period)	MW201 (0.08 ug/L in Mar 2023, not sampled prior to monitoring period) MW235 (32.7 ug/L in Nov 2023, not sampled prior to monitoring period) MW422 (328 ug/L in Mar 2022 from 81.6 ug/L in Apr 2020) MW451 (2.38 ug/L in Mar 2023, not sampled prior to monitoring period) MW452 (4.74 ug/L in Mar 2023, not sampled prior to monitoring period) MW453 (12.6 ug/L in Mar 2023, not sampled prior to monitoring period) MW454 (43.2 ug/L in Sep 2022, not sampled prior to monitoring period)

Compounds	First-time detections	New exceedances of ecological criteria[1]	New exceedances of human health criteria	New minimums	New maximums
				MW453 (12.6 ug/L in Mar 2023, not sampled prior to monitoring period) MW454 (40.9 ug/L in Mar 2023, not sampled prior to monitoring period)	

***** MW201, MW235 and MW451-MW454 are new wells installed in the November 2020 – March 2023 period. No historical results are available.

** LOR = <0.01 ug/L

Human health criteria for groundwater denotes drinking water – groundwater (PFAS NEMP 2.0 (HEPA, 2020)).

Ecological criteria for groundwater denotes Freshwater (99% species protection values) (PFAS NEMP 2.0 (HEPA, 2020)).

1 Denotes that some samples may exceed the Freshwater 99% Species Protection Guideline (HEPA 2020) due to the Limit of Reporting being greater than the Guideline Criteria.

7.1.6 Groundwater non-PFAS analytical results

In addition to PFAS, selected groundwater samples were analysed for the following geochemical properties:

- Major ions (sodium, calcium, magnesium, and potassium) and anions (chlorine, sulphate, bicarbonate, carbonate)
- Total Suspended Solids (TSS)
- Dissolved Organic Carbon (DOC).

The geochemical results are presented in **Table T2, Appendix C**.

It should be noted that non-PFAS sampling parameters were removed from the OMP program by direction from Defence as of 27 January 2021 and therefore analysis after this date has not been undertaken.

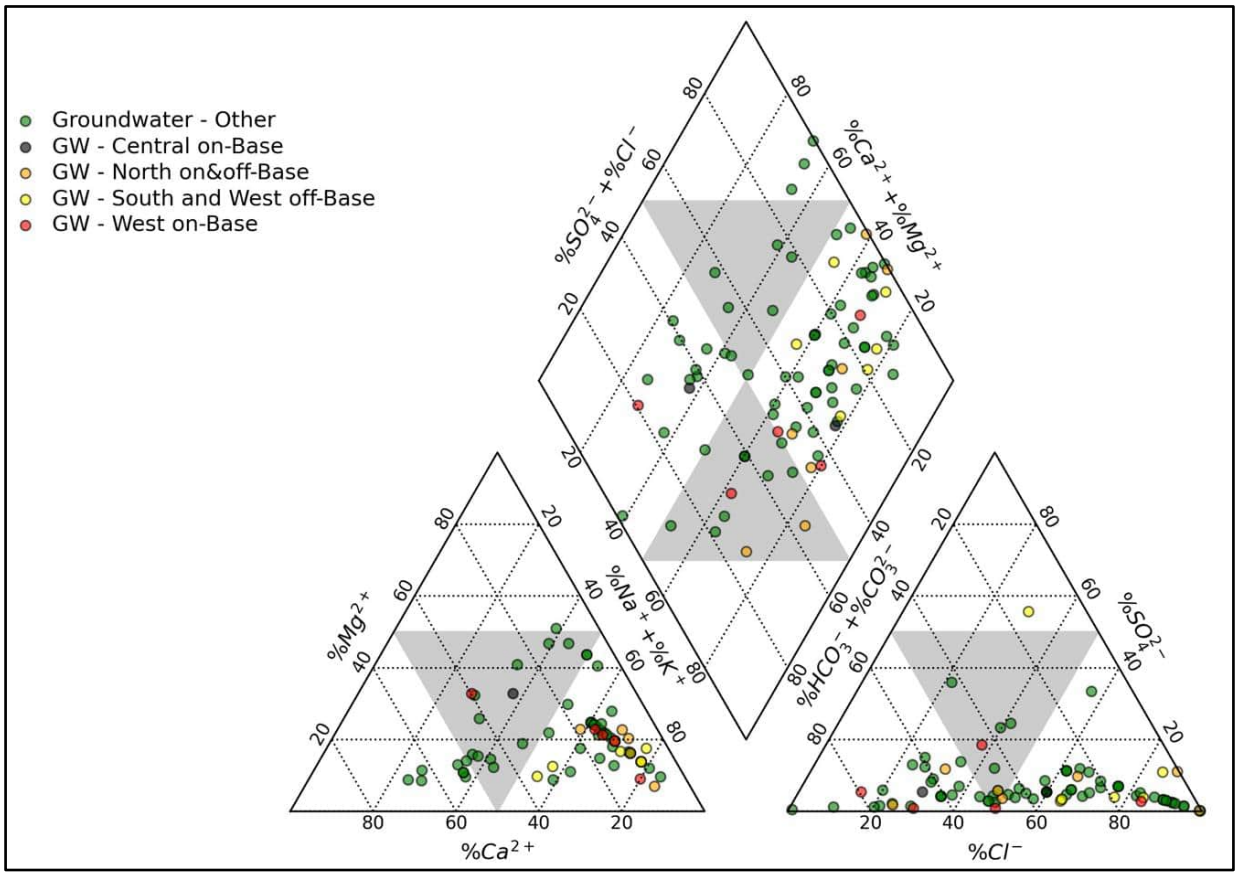
Results for major ions for monitoring events in November 2020 indicate that the cation composition is dominated by sodium and the anion composition is dominated by chloride and bicarbonate in both on-base and off-base groundwater monitoring locations.

Sampling for major ion composition have previously been conducted at groundwater and surface water locations since 2019 to assess major groundwater flow paths and identify potential surface water to groundwater interactions. During this reporting period major ions were only collected during the November 2020 monitoring event.

Piper plots provide an effective graphical method to segregate relevant analytical data to better understand the sources of dissolved constituents in water. The Piper plots were generated utilising python package for the Visualisation of Aqueous Geochemical Data Using Python (NGWA, 2022). One plot was created for the entire historical groundwater dataset, and another plot for the entire historical surface water dataset. Both piper plots have been included as **Figure 4** and **Figure 5,** below. The data indicates:

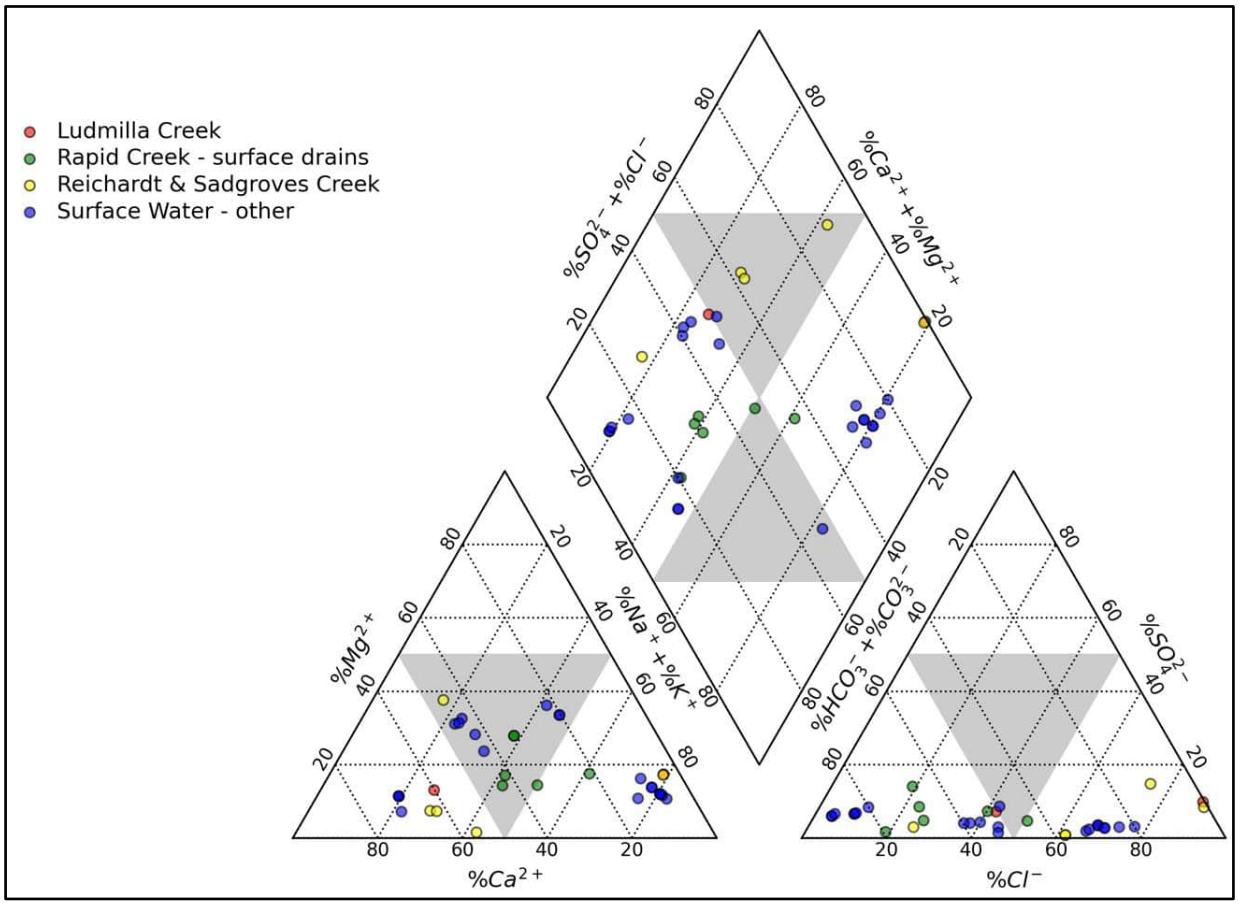
- Groundwater is dominantly sodium-chloride type, indicating influence from marine waters to the north, west, and south of the base. However, groundwater sampled from MW103, MW292, and MW303 contained higher calcium and bicarbonate concentrations relative to sodium and chloride when compared to other groundwater wells sampled. As such, groundwater from these two bores trend toward magnesium-bicarbonate and mixed type, respectively, suggesting proximity to a freshwater source (i.e., zone of recharge).
- Co-located groundwater and surface water samples MW191 and SW168 (base drain outlet to Rapid Creek near Charles Eaton Drive) exhibit similar chemistry (i.e., sodium-chloride type), suggesting possible groundwater to surface water interaction at this location.

Figure 4 Piper plot – groundwater locations – 2019 - 2021



*Groundwater – Other locations are locations not sampled as part of the current OMP program.

Figure 5 Piper plot – surface water locations – 2019 - 2021



*Surface water – Other locations are locations not sampled as part of the current OMP program.

From the generated plots, the following assessment was determined:

- Groundwater in wells centrally located on-base and western portions of the base typically varied between magnesium bicarbonate type (end of wet / start of dry) and sodium chloride type (end of dry / start of wet).
- Groundwater in off-base wells to the south and west were sodium chloride type.
- Groundwater in wells in northern portions of the base and off-base to the north were typically sodium chloride type with the exception of one location (MW185) which was mixed type.
- Surface waters within Ludmilla Creek were magnesium bicarbonate type.
- Surface waters within Rapid Creek and Reichardt and Sadgroves Creek ranged from magnesium bicarbonate type to mixed type with one outlier for Rapid Creek being sodium bicarbonate type. This is likely to be attributed to seasonal or tidal influx at the time of sampling.

7.2 Surface water

7.2.1 Surface water field observations

The field observations during surface water sampling are provided in **Table T3** in **Appendix C**, and key observations are summarised below.

Surface water observations during the monitoring period were recorded to be generally clear to moderately turbid, colourless to light brown colour, and mostly without odour or sheens with the exception of the following:

- Brackish or saline odour at:

  - SW112, SW113, SW120, and SW124.
- Organic odour at:
  - SW109, SW114, SW115, SW120, and SW181.
- Presence of sheen at:
  - SW113, SW109, SW170, and SW312.

7.2.2 Water quality parameter - field measurements

Surface water quality parameter field measurements were recorded at the time of collecting samples.

The recorded water quality parameters are presented in each of the respective factual reports in **Appendix B** and results are provided in full as **Table T3 Appendix C**.

The readings for the monitoring period are provided below in **Table 15** and **Table 16**. These results are considered consistent with previous investigations (AECOM, 2020).

Table 15 Surface water field parameter ranges (min – max) – on-base

Event	No. of samples	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH	Corrected redox (mV)	Temperature (°C)
Historical	3	3.60 (SW104) - 5.10 (SW160) *Oxygenated conditions*	15.6 (SW160) - 59.6 (SW106) *Freshwater conditions*	6.26 (SW106) - 7.40 (SW160) *Approx. neutral conditions*	393.9 (SW160) – 412.3 (SW104) *Oxidising conditions*	25.1 (SW160) - 29.8 (SW104)
Dec 2020 (start of wet season)	3	3.41 (SW106) – 4.98 (SW181) *Oxygenated conditions*	23.3 (SW104) -97.8 (SW181) *Freshwater conditions*	7.18 (SW106) – 8.46 (SW181) *Neutral to mildly basic conditions*	355.5 (SW104) – 369.6 (SW106) *Oxidising conditions*	28.6 (SW108) – 31.7 (SW181)
Apr & May 2021 (end of wet season)	4	2.22 (SW104) – 3.30 (SW106) *Oxygenated conditions*	48.6 (SW162) – 69.5 (SW104) *Freshwater conditions*	5.57 (SW170) – 6.81 (SW104) *Slightly acidic to neutral conditions*	332.4 (SW162) – 464.4 (SW104) *Oxidising conditions*	29 (SW170) – 32.8 (SW162
Jan 2022 (monthly wet season & end of wet season	9	3.27 (SW152) – 4.50 (SW124) *Oxygenated conditions*	42.0 (SW160) – 285.1 (SW106) *Freshwater conditions*	6.67 (SW170) – 8.00 (SW104) *Neutral to mildly basic conditions*	296.3 (SW170) - 380.1 (SW104) *Oxidising conditions*	27.5 (SW112) - 31.6 (SW170)
Mar 2022 (monthly wet season)	6	3.34 (SW106) - 6.17 (SW152) *Oxygenated conditions*	48.2 (SW106) - 154.4 (SW170) *Freshwater conditions*	5.53 (SW170)- 6.75 (SW178) *Slightly acidic to neutral conditions*	277.6 (SW181) - 300.2 (SW170) *Oxidising conditions*	29.3 (SW104) - 33.1 (SW152)
Nov 2022 (start of wet season)	8	0.94 (SW162) - 1.87 (SW181) *Relatively poor to oxygenated conditions*	13.1 (SW181) - 78.5 (SW156) *Freshwater conditions*	5.22 (SW108) – 7.00 (SW170) *Slightly acidic to neutral conditions*	125.0 (SW160) - 272.4 (SW106) *Oxidising conditions*	27.8 (SW108) - 34.3 (SW156)
Mar 2023 (monthly wet season)	12	2.30 (SW104) - 4.79 (SW312) *Oxygenated conditions*	22.9 (SW312) - 51.8 (SW152) *Freshwater conditions*	5.37 (SW104) - 6.65 (SW178) *Slightly acidic to neutral conditions*	253.3 (SW106) - 306.6 (SW178) *Oxidising conditions*	24.9 (SW170) - 31.6 (SW170)

Table 16 Surface water field parameter ranges (min – max) – off-base

Event	No. of samples	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH	Corrected redox (mV)	Temperature (°C)
Historical	14	2.21 (SW115) - 5.60 (SW113) *Oxygenated conditions*	32.9 (SW114) – 5,0147 (SW124) *Freshwater to saline conditions*	5.56 (SW168) - 7.88 (SW124) *Slightly acidic to slightly basic conditions*	289.6 (SW133) - 407.6 (SW115) *Oxidising conditions*	26.1 (SW113) - 31.3 (SW133)
Dec 2020 (start of wet season)	13	2.51 (SW112) - 5.71 (SW124) *Oxygenated conditions*	19.5 (SW115) – 44,573.0 (SW124) *Freshwater to saline conditions*	6.37 (SW168) - 9.55 (SW133) *Slightly acidic to basic conditions*	298.4 (SW133) - 395.1 (SW113) *Oxidising conditions*	27.2 (SW132) - 27.2 (SW132))
Apr & May 2021 (end of wet season)	12	1.13 (SW115) - 5.36 (SW114) *Oxygenated conditions*	28.4 (SW133) – 71,652.0 (SW120) *Freshwater to saline conditions*	5.63 (SW132) - 8.09 (SW120) *Slightly acidic to slightly basic conditions*	252.8 (SW112) - 422.8 (SW108) *Oxidising conditions*	27.7 (SW112) - 32.2 (SW168)
Jan 2022 (monthly wet season & end of wet season	13	2.34 (SW114) - 4.31 (SW133) *Oxygenated conditions*	51.3 (SW168) - 24913 (SW124) *Freshwater to saline conditions*	5.61 (SW168) - 8.25 (SW115) *Slightly acidic to slightly basic conditions*	255.5 (SW132) - 406.5 (SW168) *Oxidising conditions*	28.8 (SW114) - 32.3 (SW133)
Mar 2022 (monthly wet season)	13	3.01 (SW120) - 7.50 (SW112) *Oxygenated conditions*	45.0 (SW114) – 38,563.0 (SW124) *Freshwater to saline conditions*	4.98 (SW114) - 8.25 (SW115) *Acidic to slightly basic conditions*	259.9 (SW143) - 322.1 (SW113) *Oxidising conditions*	28.9 (SW12)4 - 33.8 (SW125)
Nov 2022 (start of wet season)	14	0.10 (SW124) - 1.21 (SW125) *Poor to relatively poorly oxygenated conditions*	15.9 (SW114) - 58105 (SW124) *Freshwater to saline conditions*	5.22 (SW108) - 8.72 (SW125) *Acidic to basic conditions*	102.4 (SW300) - 300.6 (SW125) *Oxidising conditions*	28.4 (SW120) - 32 (SW115)
Mar 2023 (monthly wet season)	16	3.04 (SW120) - 4.76 (SW125) *Oxygenated conditions*	22.4 (SW133) – 8,889.0 (SW113) *Freshwater to saline conditions*	5.15 (SW168) - 7.71 (SW124) Acidic to slightly basic conditions	233.1 (SW132) - 327.1 (SW113) *Oxidising conditions*	27.9 (SW109) - 33.9 (SW168)

7.2.3 Surface water PFAS analytical results

Historical surface water analytical results for the monitoring period are presented in **Table T4** (**Appendix C**) and monitoring activities are summarised in the factual reports provided in **Appendix B**.

Surface water results for all sampling events within the monitoring period are presented in figure series **Figure F5 (Appendix A)**, summarised in **Table 17** and **Table 18** and further discussed in **Section 8.4**.

Deviations from historical surface water dataset are summarised in **Table 19**.

Table 17 Summary of PFOS, PFOA and PFOS+PFHxS concentrations in surface water – on-base

Sampling Event	No. of Samples[1]	Compound	Concentration Range (µg/L) in Sampling Event	No. of Samples[1] with Concentration > LOR	No. of Exceedances of Human Health Criteria	No. of Exceedances of Ecological Criteria*
On-base monitoring locations						
Dec 2020	2	PFOA	N/A	0	0	0
		PFOS	0.05 µg/L (SW162) to 0.35 µg/L (SW181)	2	NA	2
		PFOS+PFHxS	0.05 µg/L (SW162) to 0.38 µg/L (SW181)	2	0	NA
Apr and May 2021	3	PFOA	N/A	0	0	0
		PFOS	0.01 µg/L (SW178) to 0.24 µg/L (SW170)	3	NA	3
		PFOS+PFHxS	0.01 µg/L (SW178) to 0.33 µg/L (SW170)	3	0	NA
Jan 2022	7	PFOA	0.02 µg/L (SW156) to 0.02 µg/L (SW156)	1	0	0
		PFOS	0.02 µg/L (SW162) to 0.42 µg/L (SW170)	7	NA	7
		PFOS+PFHxS	0.02 µg/L (SW162) to 0.57 µg/L (SW170)	7	0	NA
Mar 2022	5	PFOA	0.02 µg/L (SW156) to 0.02 µg/L (SW156)	0	0	0
		PFOS	0.02 µg/L (SW162) to 0.42 µg/L (SW170)	4	NA	4
		PFOS+PFHxS	0.02 µg/L (SW162) to 0.57 µg/L (SW170)	5	0	NA
Nov 2022	6	PFOA	0.01 µg/L (multiple) to 0.01 µg/L (multiple)	6	0	0
		PFOS	0.03 µg/L (SW181) to 0.85 µg/L (SW170)	6	NA	6
		PFOS+PFHxS	0.03 µg/L (SW181) to 0.9 µg/L (SW170)	6	0	NA
Mar 2023	8	PFOA	0.01 µg/L (multiple) to 0.06 µg/L (SW312)	8	0	0
		PFOS	0.01 µg/L (SW162) to 1.63 µg/L (SW312)	8	NA	8
		PFOS+PFHxS	0.01 µg/L (SW162) to 2.52 µg/L (SW312)	8	1	NA

***** Denotes that some samples may exceed the Freshwater 99% Species Protection Guideline (HEPA 2020) due to the Limit of Reporting being greater than the Guideline Criteria.
NA = Not applicable (no applicable guideline)
1 Denotes that count of all samples (primary and duplicates).
Human health criteria for surface water denotes recreational water – surface water (PFAS NEMP 2.0 (HEPA, 2020)).
Ecological criteria for surface water denotes Freshwater (99% species protection values) (PFAS NEMP 2.0 (HEPA, 2020)).

Table 18 Summary of PFOS, PFOA and PFOS+PFHxS concentrations in surface water – off-base

Sampling Event	No. of Samples[1]	Compound	Concentration Range (µg/L) in Sampling Event	No. of Samples[1] with Concentration > LOR	No. of Exceedances of Human Health Criteria	No. of Exceedances of Ecological Criteria*
Off-base monitoring locations						
Dec 2020	15	PFOA	0.01 µg/L (multiple) to 0.06 µg/L (SW125)	4	0	0
		PFOS	0.02 µg/L (SW104) to 2.82 µg/L (SW125)	13	NA	13
		PFOS+PFHxS	0.01 µg/L (multiple) to 4.21 µg/L (SW125)	15	1	NA
Apr and May 2021	14	PFOA	0.01 µg/L (SW108) to 0.05 µg/L (SW168)	6	0	0
		PFOS	0.02 µg/L (multiple) to 1.26 µg/L (SW114)	10	NA	10
		PFOS+PFHxS	0.01 µg/L (multiple) to 1.71 µg/L (SW114)	13	0	NA
Jan 2022	15	PFOA	0.01 µg/L (SW108) to 0.05 µg/L (SW168)	9	0	0
		PFOS	0.02 µg/L (multiple) to 1.26 µg/L (SW114)	15	NA	15
		PFOS+PFHxS	0.01 µg/L (multiple) to 1.71 µg/L (SW114)	15	2	NA
Mar 2022	14	PFOA	0.01 µg/L (multiple) to 0.06 µg/L (multiple)	11	0	0
		PFOS	0.06 µg/L (SW133) to 3.24 µg/L (SW114)	14	NA	14
		PFOS+PFHxS	0.13 µg/L (SW133) to 4.79 µg/L (SW114)	14	2	NA
Nov 2022	16	PFOA	0.01 µg/L (multiple) to 0.06 µg/L (SW125)	16	0	0
		PFOS	0.01 µg/L (multiple) to 2.27 µg/L (SW125)	16	NA	16
		PFOS+PFHxS	0.01 µg/L (multiple) to 3.45 µg/L (SW125)	16	1	NA
Mar 2023	26	PFOA	0.01 µg/L (multiple) to 0.35 µg/L (SW300)	16	0	0
		PFOS	0.01 µg/L (SW115) to 3.79 µg/L (SW114)	16	NA	16
		PFOS+PFHxS	0.01 µg/L (SW115) to 5.37 µg/L (SW114)	16	4	NA

***** Denotes that some samples may exceed the Freshwater 99% Species Protection Guideline (HEPA 2020) due to the Limit of Reporting being greater than the Guideline Criteria.
NA = Not applicable (no applicable guideline)
1 Denotes that count of all samples (primary and duplicates).
Human health criteria for surface water denotes recreational water – surface water (PFAS NEMP 2.0 (HEPA, 2020)).
Ecological criteria for surface water denotes Freshwater (99% species protection values) (PFAS NEMP 2.0 (HEPA, 2020)).

Table 19 Deviations from historical surface water dataset

Compounds	First-time detections	New exceedances of ecological criteria	New exceedances of human health criteria	New minimums	New maximums
PFOS	SW152 (0.18 ug/L in Jan 2022) SW300 (0.77 ug/L in Jan 2023) SW312 (0.65 ug/L in Dec 2022)	SW152 (0.18 ug/L in Jan 2022) SW300 (0.77 ug/L in Jan 2023) SW312 (0.65 ug/L in Dec 2022)	No criteria available	SW104 (0.02 ug/L in Dec 2020 from 0.07 ug/L in Mar 2019) SW109 (0.26 ug/L in Feb 2023 from 0.35 ug/L in Jan 2020) SW114 (LOR** in Dec 2020 from 0.04 ug/L in Oct 2017) SW133 (LOR** in Apr 2021 from 0.04 ug/L in Jan 2020) SW152 (0.16 ug/L in Mar 2022, not sampled prior to monitoring period) SW168 (0.27 ug/L in Dec 2020 from 0.69 ug/L in Jan 2020) SW170 (0.09 ug/L in Feb 2023 from 0.12 ug/L in Jan 2020) SW300 (LOR** in Nov 2022, not sampled prior to monitoring period) SW312 (0.65 ug/L in Dec 2022, not sampled prior to monitoring period)	SW104 (2.46 ug/L in Mar 2023 from 2.08 ug/L in Apr 2020) SW113 (0.39 ug/L in Jan 2022 from 0.38 ug/L in Mar 2018) SW124 (0.59 ug/L in Jan 2022 from 0.07 ug/L in Mar 2019) SW152 (0.23 ug/L in Mar 2023, not sampled prior to monitoring period) SW156 (0.56 ug/L in Mar 2023 from 0.38 ug/L in Mar 2018) SW178 (0.34 ug/L in Jan 2022 from 0.04 ug/L in Mar 2019) SW181 (0.96 ug/L in Mar 2023 from 0.57 ug/L in Mar 2018) SW300 (1.24 ug/L in Apr 2023, not sampled prior to monitoring period) SW312 (1.71 ug/L in Feb 2023, not sampled prior to monitoring period)
PFOA	SW156 (0.02 ug/L in Jan 2022) SW300 (0.26 ug/L in Jan 2023)	N/A	N/A	SW152 (LOR** in Jan 2022, not sampled prior to monitoring period) SW168 (LOR** in Dec 2020 from 0.01 ug/L in Feb 2018)	SW152 (LOR** in Jan 2022, not sampled prior to monitoring period)

Compounds	First-time detections	New exceedances of ecological criteria	New exceedances of human health criteria	New minimums	New maximums
	SW312 (0.02 ug/L in Jan 2023)			SW300 (LOR** in Nov 2022, not sampled prior to monitoring period) SW312 (LOR** in Dec 2022, not sampled prior to monitoring period)	SW156 (0.04 ug/L in Mar 2023 from LOR** in Jan 2018) SW300 (0.36 ug/L in Apr 2023, not sampled prior to monitoring period) SW312 (0.06 ug/L in Mar 2023, not sampled prior to monitoring period)
PFOS+PFHxS	SW152 (0.22 ug/L in Jan 2022) SW300 (1.72 ug/L in Jan 2023) SW312 (0.73 ug/L in Dec 2022)	No criteria available	SW300 (2.14 ug/L in Mar 2023) SW312 (2.23 ug/L in Feb 2023)	SW104 (0.02 ug/L in Dec 2020 from 0.12 ug/L in Mar 2019) SW109 (0.36 ug/L in Feb 2023 from 0.54 ug/L in Jan 2020) SW114 (LOR** in Dec 2020 from 0.05 ug/L in Oct 2017) SW133 (0.01 ug/L in Apr 2021 from 0.09 ug/L in Jan 2020) SW152 (0.22 ug/L in Jan 2022, not sampled prior to monitoring period) SW168 (0.34 ug/L in Dec 2020 from 1.11 ug/L in Mar 2018) SW300 (0.01 ug/L in Nov 2022, not sampled prior to monitoring period) SW312 (0.73 ug/L in Dec 2022, not sampled prior to monitoring period)	SW104 (3.7 ug/L in Mar 2023 from 3.57 ug/L in Apr 2020) SW113 (0.59 ug/L in Jan 2022 from 0.54 ug/L in Mar 2018) SW124 (0.76 ug/L in Jan 2022 from 0.13 ug/L in Mar 2019) SW152 (0.29 ug/L in Mar 2023, not sampled prior to monitoring period) SW178 (0.38 ug/L in Jan 2022 from 0.04 ug/L in Mar 2019) SW181 (1.04 ug/L in Mar 2023 from 0.64 ug/L in Mar 2018) SW300 (2.2 ug/L in Apr 2023, not sampled prior to monitoring period)

Compounds	First-time detections	New exceedances of ecological criteria	New exceedances of human health criteria	New minimums	New maximums
					SW312 (2.52 ug/L in Mar 2023, not sampled prior to monitoring period)

***** SW152, SW300 and SW312 are new surface water sampling locations included as part of the November 2020 – March 2023 sampling period.

** LOR = <0.01 ug/L

7.3 Aquatic biota

Aquatic biota (edible fish, crustaceans, and molluscs) monitoring is conducted once per year at the end of the wet and dry seasons within the Management Area in Ludmilla Creek and Rapid Creek. The monitoring data is used to assess changes in PFAS concentrations in aquatic biota over time and confirm ongoing relevance of data used to inform the Northern Territory Department of Health (NT Health).

As of the most recent biota monitoring event (AECOM, 2023b), all locations were accessed and sampled.

The aquatic biota results for the monitoring period are presented in **Table T5** (**Appendix C**) and the locations are presented in **Figure F3** (**Appendix A**).

The PFOS, PFOA and PFOS+PFHxS concentrations for the monitoring period are summarised in **Table 20** below.

An assessment of the results is provided in **Section 8.6**.

Table 20 Summary of PFOS, PFOA and PFOS+PFHxS - biota

Sampling event	No. of samples	Compound	Sample concentration range (>LOR) (mg/kg)	No. of samples with concentrations above LOR	No. of samples exceeding 2-6 years finfish (all species) (Department of Health 2019)	No. of samples exceeding 2-6 years crustaceans (all species) (Department of Health 2019)
BIOFA007 – Rapid Creek Mouth						
November 2020	16 finfish samples	PFOS	<0.001 to 0.004	6	0	NA
		PFOA	<0.001	0	0	NA
		PFOS+PFHxS	<0.001 to 0.004	6	0	NA
BIOFA016 - Ludmilla Creek (Estuarine Area)						
November 2020	5 invertebrate samples	PFOS	<0.001 to 0.002	4	NA	0
		PFOA	<0.001 to 0.008	3	NA	0
		PFOS+PFHxS	<0.001 to 0.004	4	NA	0
BIOFA018 - Ludmilla Creek (Boat Ramp)						
November 2020	17 finfish samples	PFOS	<0.001 to 0.001	3	0	NA
		PFOA	<0.001 (all samples below LOR)	0	0	NA
		PFOS+PFHxS	<0.001 to 0.001	3	0	NA
BIOFA024 – Rapid Creek (Freshwater)						
November 2020	2 crustacean samples	PFOS	<0.001 to 0.001	2	NA	0
		PFOA	<0.001 (all samples below LOR)	0	NA	0
		PFOS+PFHxS	<0.001 to 0.003	2	NA	0

Sampling event	No. of samples	Compound	Sample concentration range (>LOR) (mg/kg)	No. of samples with concentrations above LOR	No. of samples exceeding 2-6 years finfish (all species) (Department of Health 2019)	No. of samples exceeding 2-6 years crustaceans (all species) (Department of Health 2019)
BIOFA026 - Rapid Creek (Freshwater)						
November 2020	1 crustacean sample	PFOS	0.001	1	NA	0
		PFOA	<0.001 (all samples below LOR)	0	NA	0
		PFOS+PFHxS	0.009	1	NA	0
BIOFA028 - Rapid Creek (Freshwater)						
November 2020	2 crustacean samples	PFOS	0.002 to 0.003	2	NA	0
		PFOA	<0.001 (all samples below LOR)	0	NA	0
		PFOS+PFHxS	0.008 to 0.011	2	NA	0
BIOFA007 – Rapid Creek Mouth						
November 2021	19 finfish samples	PFOS	<0.001 to 0.009	13	2	NA
		PFOA	<0.001	0	0	NA
		PFOS+PFHxS	<0.001 to 0.009	13	2	NA
BIOFA016 - Ludmilla Creek (Estuarine Area)						
November 2021	5 invertebrate samples	PFOS	0.007 to 0.012	5	NA	0
		PFOA	<0.001 to 0.004	3	NA	0
		PFOS+PFHxS	0.007 to 0.012	5	NA	0
BIOFA018 - Ludmilla Creek (Boat Ramp)						
November 2021	21 Fin-fish samples	PFOS	<0.001 to 0.009	15	4	NA
		PFOA	<0.001 (all samples below LOR)	0	0	NA

Sampling event	No. of samples	Compound	Sample concentration range (>LOR) (mg/kg)	No. of samples with concentrations above LOR	No. of samples exceeding 2-6 years finfish (all species) (Department of Health 2019)	No. of samples exceeding 2-6 years crustaceans (all species) (Department of Health 2019)
		PFOS+PFHxS	<0.001 to 0.01	15	5	NA
BIOFA024 – Rapid Creek (Freshwater)						
November 2021	3 crustacean sample	PFOS	0.011 to 0.043	3	NA	0
		PFOA	<0.001 (all samples below LOR)	0	NA	0
		PFOS+PFHxS	0.016 to 0.058	3	NA	0
BIOFA026 - Rapid Creek (Freshwater)						
November 2021	3 crustacean samples	PFOS	0.021 to 0.022	3	NA	0
		PFOA	<0.001 (all samples below LOR)	0	NA	0
		PFOS+PFHxS	0.03 to 0.034	3	NA	0
BIOFA028 - Rapid Creek (Freshwater)						
November 2021	3 crustacean samples	PFOS	0.022 to 0.047	3	NA	0
		PFOA	<0.001 (all samples below LOR)	0	NA	0
		PFOS+PFHxS	0.038 to 0.068	3	NA	1
BIOFA007 – Rapid Creek Mouth						
November 2022	20 finfish samples and 1 crustacean sample	PFOS	<0.001 to 0.03	14	5	0
		PFOA	<0.001	0	0	0
		PFOS+PFHxS	<0.001 to 0.03	14	5	0
BIOFA016 - Ludmilla Creek (Estuarine Area)						
November 2022		PFOS	0.006 to 0.018	5	NA	0

Sampling event	No. of samples	Compound	Sample concentration range (>LOR) (mg/kg)	No. of samples with concentrations above LOR	No. of samples exceeding 2-6 years finfish (all species) (Department of Health 2019)	No. of samples exceeding 2-6 years crustaceans (all species) (Department of Health 2019)
	5 invertebrate samples	PFOA	0.001 to 0.003	3	NA	0
		PFOS+PFHxS	0.006 to 0.018	5	NA	0
BIOFA018 - Ludmilla Creek (Boat Ramp)						
November 2022	27 finfish and 3 crustacean samples	PFOS	<0.001 to 0.047	9	2	0
		PFOA	<0.001 to 0.001	1	0	0
		PFOS+PFHxS	<0.001 to 0.047	9	2	0
BIOFA024 – Rapid Creek (Freshwater)						
November 2022	3 crustacean sample	PFOS	<0.001 to 0.006	2	NA	0
		PFOA	<0.001 (all samples below LOR)	0	NA	0
		PFOS+PFHxS	<0.001 to 0.011	2	NA	0
BIOFA026 - Rapid Creek (Freshwater)						
November 2022	3 crustacean samples	PFOS	0.026 to 0.066	3	NA	1
		PFOA	<0.001 (all samples below LOR)	0	NA	0
		PFOS+PFHxS	0.033 to 0.078	3	NA	1
BIOFA028 - Rapid Creek (Freshwater)						
November 2022	3 crustacean samples	PFOS	0.01 to 0.115	3	NA	1
		PFOA	<0.001 to 0.002	1	NA	0
		PFOS+PFHxS	0.049 to 0.139	3	NA	1

NA = Not applicable (no applicable guideline)

8.0 Interpretive analysis

In addition to monitoring period data, historical data from 2018, 2019, and 2020 was included in the assessment to analyse temporal trends, and the Site setting as outlined in **Section 2.0** was considered with regards to interpretation of the results. The historical data was obtained from the following reports:

- *Detailed Site Investigation - Per - and Poly-fluoroalkyl Substances (PFAS) RAAF Base Darwin* (Coffey, 2018a)
- *Supplementary Detailed Site Investigation - Per- and Poly-fluoroalkyl Substances (PFAS) - RAAF Base Darwin* (Coffey, 2018b)
- *RAAF Base Darwin PFAS Health Risk Assessment* (Coffey, 2018c)
- *PFAS Management Area Plan - RAAF Base Darwin* (Defence, 2019)
- *RAAF Base Darwin - Interpretive Report 2020* (AECOM, 2020).

For groundwater, where sufficient data is available, nominally eight or more like data points, Mann-Kendall statistical analysis has been utilised to determine the presence or non-presence of trends within individual monitoring locations. The smaller the sample set size available for statistical analysis the lower the potential accuracy of the statistical analysis results. As such, Mann-Kendall statistical analysis has only been applied to locations with a minimum of seven available data points. Additionally, where a location appears to be seasonally influenced with higher or lower concentrations reported during dry or wet seasons, the application of Mann-Kendall statistical analysis has been assessed to have limited benefit. In these instances, the assessment of results has been guided by temporal trend review instead. For surface water, temporal trend assessment of scatter plots presenting concentrations against daily rainfall averages were carried out.

8.1 Hydrogeology

The SWLs were measured in groundwater monitoring wells and corrected to groundwater elevations (in m AHD). Depth to groundwater measurements are presented in **Table T1**, **Appendix C** and the inferred potentiometric contours for the monitoring wells for the November 2020 through March 2023 monitoring events are presented on **Figure F2a – Figure F2f** (**Appendix A**).

Groundwater levels fluctuate across the Management Area over the wet and dry seasons, with higher groundwater levels recorded in the late wet season and lower groundwater levels recorded in the late dry season. Groundwater levels show between an approximate 1-metre and a 7-metre difference between late wet and late dry season well gauge readings.

The inferred groundwater flow during the monitoring period at the base is consistent with the DSI (Coffey, 2018a), with inferred groundwater flow following the localised topography, flowing north (towards Rapid Creek) from the southern side of the main runway, to the south (towards Sadgroves and Reichardt Creek) in the south of the base, and to the west (towards Ludmilla Creek) in the southwest of the base.

8.2 Groundwater results

8.2.1 Overview

The highest PFAS concentrations reported for the monitoring period (between November 2020 and June 2023) were detected on-base within source areas, in line with the CSM. The maximum concentrations of PFOS+PFHxS reported during the monitoring period were as follows:

- Source Area 1, FFTA 1: 328 µg/L at MW422 (March 2022)
- Source Area 4, FFF 6: 131 µg/L at MW303 (November 2020)
- Source Area 6, ARFF fire station: 309 µg/L at MW115 (November 2020)
- Source Area 11, CFTA: 102 µg/L at MW240 (November 2020).

PFOS, PFOA or PFHxS concentrations were detected in monitoring wells down-hydraulic gradient from the identified PFAS source areas and suggest that the groundwater impacts are likely to be associated with these source areas.

The maximum off-base PFOS+PFHxS concentration was 23.2 µg/L at MW197 on the northern base boundary (in November 2021). Other than MW197, the maximum off-base PFOS+PFHxS concentration in groundwater was 4.75 µg/L at MW194 (in March 2023) also on the northern base boundary. These suggest that the PFAS impact in groundwater is attributable to on-base PFAS source areas.

Reported concentrations of PFOS and PFHxS and/or PFOA exceeded previous maximum concentrations at seven locations during the monitoring period, as follows:

- **On-base**: MW103 (Source Area 9), MW141 (boundary well down hydraulic gradient of Source Area 2), and MW422 (Source Area 1)
- **Off-base**: MW176 (south of the base), MW185 (north of the base), MW197 (north of the base), and MW209 (southwest of the base).

These results indicate that there is variability in concentrations of PFAS in groundwater. Note that the significance of this variation is discussed based on regions of interest in **Section 8.3** below.

In addition to the seven locations above, six on-base locations (MW201, MW235, MW451, MW452, MW453, MW454) were included in OMP monitoring for the first time during the monitoring period. These locations recorded concentrations of PFAS greater than the LOR, and exceedances of both ecological criteria and human health criteria (details in **Section 7.1.5**). These monitoring wells are located within the existing Management Area, and groundwater monitoring has been completed as part of the OMP historically in the vicinity of these locations. Specifically, MW201, MW451, and MW452 are located in the western on-base region, MW235 and MW454 are located in the southeast on-base region, whilst MW453 is located in the north on-base region. The results obtained from the six locations during the monitoring period are within the historic concentration range for each of their respective regions. As such these results are not considered to represent a change in the groundwater conditions for these regions, nor a subsequent change in risk profile.

The PFAS concentrations in the remaining groundwater monitoring locations were also within historical ranges. The reported concentrations from each sampling event included in this monitoring period are further discussed in the sections below.

The nature and extent of groundwater PFAS are generally consistent with the understanding presented in the 2020 AIR (AECOM, 2020), with the exception of the following changes identified during this monitoring period:

- Review of the concentration trend in MW422 (Source Area 1) was recommended in the previous report (AECOM, 2020) following its use as replacement for MW255, and subsequent new maximum concentration reported for PFAS. During the current monitoring period, MW422 became inaccessible due to construction works (last sampled in March 2022, discussed in **Table 4**) and ongoing monitoring in this area was moved to alternate well MW235 (Sampled from September 2022). From the available data the concentration trend at MW422 appeared to be increasing (discussed in **Section 8.3.6** below). As discussed in **Section 6.2** there has been PFAS soil remediation activities completed in this source area. The concentrations here will continue to be monitored for changes as part of the OMP.
- Further monitoring at MW103 located at the former RAAF Fire Station (Source Area 9) during the monitoring period has confirmed an increasing concentration trend for both PFOA and PFOS+PFHxS. Concentrations are noted to remain within an order of magnitude of historical ranges.
- Off-base well MW195 reported concentrations above recreational human health criteria (NHMRC, 2019) during the 2019-2020 monitoring period. During the current monitoring period concentrations were below recreational human health criteria, reported a stable trend, and remained within historical ranges.

8.3 Groundwater PFAS temporal trends

8.3.1 Overview

Temporal graphs and Mann-Kendall analysis are presented in **Appendix D** and **Appendix E**, respectively, for PFOS+PFHxS and PFOA concentrations in groundwater at the following selected locations indicative of regions of interest within the on-base and off-base areas:

- Western (on-base)
- South and west (off-base)
- North (on-base and off-base)
- Central (on-base)
- Southeast (on-base).

A summary of the temporal trend graphs (included as **Appendix D**) which present historical groundwater concentrations of PFOA and PFOS+PFHxS for the regions of interest are outlined in **Table 21** below.

Table 21 Summary of groundwater monitoring areas – temporal trend graphs

Graph ID	Regions of interest	Groundwater locations
G1 and G2	Western (on-base)	**On-base** MW103, MW107, MW128, MW148, MW201, MW215, MW405, MW451, MW452
G3 and G4	South and west (off-base)	**Off-base** MW176, MW180, MW200, MW209, MW210, MW211
G5 and G6	North (on-base and off-base)	**On-base** MW156, MW240, MW241, MW453 **Off-base** MW185, MW189, MW190, MW191, MW193, MW194, MW195, MW197
G7 and G8	Central (on-base)	**On-base** MW115, MW133, MW144, MW205, MW292, MW303
G9 and G10	Southeast (on-base)	**On-base** MW112, MW139, MW141, MW235, MW297, MW422, MW454

The Mann-Kendall analysis was used to assess the trends in the concentrations in groundwater and whether they have a monotonic upward or downward trend. The significance of these trends is determined by the confidence factor, or p value, of the analysis, as follows:

- A confidence factor over 95% indicates that there is an increasing or decreasing trend.
- A confidence factor over 90% indicates the there is a ‘probably increasing’ or ‘probably decreasing’ trend.
- A confidence factor less than 90% indicates ‘Stable’ or ‘No trend’.

Trend analysis was undertaken for locations which were sampled in the current monitoring period and for locations which were consistently greater than the LOR. Where sample results were less than the LOR, half the LOR was adopted for the Mann-Kendall analysis. A summary of the completed Mann-Kendall analysis for PFOA and PFOS+PFHxS (included as **Appendix E**) are outlined in **Table 22** below.

Table 22 Summary of groundwater monitoring areas Mann-Kendall assessment

Summary Table ID	Region of interest	Groundwater Locations
Table 23	Western (on-base)	**On-base** MW103, MW107, MW128, MW148, MW215, MW405
Table 24	South and west (off-base)	**Off-base** MW176, MW180, MW200, MW209, MW210, MW211
Table 25	North (on-base and off-base)	**On-base** MW156, MW240, MW241 **Off-base** MW185, MW190, MW191, MW193, MW194, MW195, MW197
Table 26	Central (on-base)	**On-base** MW115, MW133, MW144, MW205, MW303
Table 28	Southeast (on-base)	**On-base** MW112, MW139, MW141, MW297, MW422

An interpretation of both the temporal trend graphs and Mann-Kendall assessments of PFOS+PFHxS and PFOA concentrations for the regions of interest is presented in the following sub-sections.

8.3.2 Western (on-base) monitoring wells

Monitoring wells in the western portion of the base target Source Areas 7 (Hangar 31), 8 (Former Fuel Farm 1) and 9 (Former RAAF Fire Station) and the movement of groundwater from these areas to the west. A summary of the well locations are as follows:

- MW103: located at the Former RAAF Fire Station (Source Area 9)
- MW107: located between FFF 1 & Former RAAF Fire Station
- MW215: located at the FFF 1 (Source Area 8)
- MW405 (destroyed): located at Hangar 31 (Source Area 7)
- MW128, MW148, MW201, MW451, MW452: located to the southwest and west, down the inferred hydraulic groundwater gradient of the source areas.

Historical concentrations of PFOA and PFOS and PFHxS in the western (on-base) monitoring wells are presented in **Table T2** (**Appendix C**) and graphically in **Graph G1 & Graph G2** (**Appendix D**).

Monitoring well MW405 (adjacent Source Area 7) was destroyed during the AIR 7000 construction project and has not been sampled since April 2020.

As discussed in **Section 3.3** (**Table 4**), this deviation from the SAQP has resulted in a loss of coverage in the area adjacent Hangar 31, though groundwater conditions in this general area are still able to be monitored through the monitoring well network. Monitoring of MW215 located adjacent Source Area 8 (and in the vicinity of Source Area 7) continued during the monitoring period (with one exception, the end of wet season event in March 2022, discussed in **Table 4**). Additionally various monitoring locations have been included in the OMP to the down hydraulic gradient south and southwest.

In the absence of MW405, sampling of these nearby locations has facilitated the continued monitoring of PFAS within the western portion of the base, though it is noted that assessment of potential changes at Source Zone 7 are limited. It is also noted that there are limited groundwater monitoring wells currently sampled under the OMP in the western portion of the base, to the northwest of Source Area 7, 8, and 9. Monitoring additional available wells in this area would reduce uncertainty.

The temporal trend analysis graphs (**Appendix D**) show that PFAS concentrations in MW103 and MW405 (locations adjacent to the sources) experience seasonal fluctuations, notably:

- At MW103 these fluctuations resulted in an increase in PFAS concentrations during the dry season, indicating a dilution effect from the wet season rainfall.
- At MW405 (for the available data) concentrations were generally seen to increase following the wet season, indicating that there might be vertical migration of contamination driven by the increased rainfall.

The Mann-Kendall statistical trends analysis indicates that monitoring location MW103 (Source Area 9) exhibits an increasing trend, whilst probably decreasing and decreasing trends are seen at MW107 (PFOS+PFHxS only) and MW148 respectively. It is noted that due to observed seasonal variability in MW103, Mann-Kendall statistical trend analysis may provide reduced benefit for trend assessment.

Reviewing beyond these results, the increases in PFAS at MW103 are noted to have occurred in Q4 2020, and concentrations have remained within an order of magnitude of the historical maximum. The reason for this increase is not known, though it is noted that this increasing trend at the source area does not define the dominant trend for the region of interest, and down hydraulic gradient monitoring results are generally decreasing or stable.

As noted in **Section 6.2**, further works are being undertaken to assess the nature and extent of PFAS contamination in source areas which includes Source Area 9. The Site RAP (in development) and remediation investigations (in progress) also include Source Area 9. The completion of these works will further inform the assessment of contamination in this region of interest.

Statistical analysis results are summarised in **Table 23** below. Note that locations MW201, MW451, and MW452 (all down hydraulic gradient) were excluded from statistical assessment as they did not have sufficient historical results (two results each).

From the temporal trend graphs **G1** and **G2** (**Appendix D**) there is evidence that MW451 and MW452 are likely to be seasonally variable, with concentrations increasing through the wet season, similar to MW405.

Table 23 Western (on-base) Mann-Kendall summary

Location ID	Analyte	Historical range	Current monitoring period	Mann-Kendall trend	
		Min – Max (µg/L)	Min – Max (µg/L)	Trend	Confidence factor
MW103[%]	PFOA	0.02-0.31	0.23-1.11	Increasing	96.9%
	PFOS+PFHxS	1.96-21.7	14.10-48.6	Increasing	96.9%
MW107	PFOA	0.15-0.26	0.16-0.27	Stable	82.3%
	PFOS+PFHxS	8.80-14.8	8.46-13.2	Probably decreasing	93.7%
MW128	PFOA	0.12-0.65	0.10-0.21	Stable	87.7%
	PFOS+PFHxS	7.90-35.2	5.52-12.00	Decreasing	99.0%
MW148	PFOA	0.10-0.45	0.10-0.13	Decreasing	99.6%
	PFOS+PFHxS	6.94-27.40	6.45-9.62	Stable	87.0%
MW215	PFOA	0.05-0.26	0.09-0.15	Stable	62.2%
	PFOS+PFHxS	3.84-14.70	5.97-9.32	Stable	58.8%
MW405[%]	PFOA	0.06-0.77	No sample	No trend	54.0%
	PFOS+PFHxS	2.03-48.90	No sample	Stable	46.0%

[%] denotes observation of seasonal variability

8.3.3 South and west (off-base) monitoring wells

The wells located to the south and west of the base monitor PFAS concentrations in groundwater migrating from on-base Source Areas towards creek and estuarine systems. The locations are summarised as:

- MW176, MW180, MW200 and MW211: located in the Winnellie industrial area which is down the inferred groundwater gradient of six Source Areas south of the main runway (Source Area 1 to 6)
- MW210: located in Coconut Grove, down the inferred groundwater gradient of Hangar 31, Former Fuel Farm 1 and the Former RAAF Fire Station (Source Area 7 to 9)
- MW209: located in the residential suburb, The Narrows.

Historical concentrations of PFOA and PFOS and PFHxS in the south and west (off-base) monitoring wells are presented in **Table T2** (**Appendix C**) and graphically in **Graph G3 and G4** (**Appendix D**).

Based on a review of the graphs, a consistent seasonal variability mechanism is not observed at these locations.

Increases in concentrations following dry season were observed at MW176, MW180, MW200, MW210, and MW211. These observations included: MW180 and MW200 in Q4 2018, MW200 in Q4 2021, and at MW176, MW180 and MW210 in Q4 2022, but these trends were not observed on an annual basis with the change of each season. The variability in the data set at these locations will likely impact the ability of Mann-Kendall assessments to determine statistical trends. It is noted that as the variability was not observed with each season, no additional seasonal variations of Mann-Kendall assessment were completed for this region.

At least one of PFOA, PFOS, or PFHxS concentrations were reported above laboratory LORs in all south and west (off-base) monitoring locations at least once during the reporting period. Analytical results are summarised in **Table 24** below.

PFOA concentrations are generally stable, at or near LOR for all locations. PFOS+PFHxS concentrations generally presented a stable trend, or no trend, though did remain within an order of magnitude of historical observations.

As noted in **Section 6.2**, further works are being undertaken to assess the nature and extent of PFAS contamination in source areas upgradient of these off-base monitoring wells (including MW209 and MW211), with remediation works having been undertaken at Source Area 1 during this monitoring period. Additionally, Site RAP (in development) and remediation investigations (in progress) will include Source Areas 3, 4, and 9. The completion of these works will further inform the assessment of this region of interest.

Table 24 South and west (off-base) Mann-Kendall summary

Location ID	Analyte	Historical range	Current monitoring period	Mann-Kendall trend	
		Min – Max (µg/L)	Min – Max (µg/L)	Trend	Confidence factor
MW176	PFOA	<LOR	<LOR – 0.01	No trend	69.4%
	PFOS+PFHxS	0.10-0.21	0.08-0.17	No trend	54.0%
MW180	PFOA	<LOR – 0.01	<LOR	Stable	65.6%
	PFOS+PFHxS	0.05-0.47	0.05-0.27	No trend	70.4%
MW200	PFOA	<LOR-0.06	<LOR-0.04	Stable	84.8%
	PFOS+PFHxS	0.62-4.1	0.61-2.49	Stable	82.1%
MW209	PFOA	<LOR	<LOR-0.01	No trend	57.1%
	PFOS+PFHxS	<LOR-0.05	<LOR-0.02	Stable	88.6%
MW210	PFOA	0.02-0.06	0.02-0.06	Stable	54.8%

Location ID	Analyte	Historical range	Current monitoring period	Mann-Kendall trend	
		Min – Max (µg/L)	Min – Max (µg/L)	Trend	Confidence factor
	PFOS+PFHxS	1.52-4.31	1.32-4.28	Stable	74.5%
MW211	PFOA	<LOR	<LOR	Stable	47.6%
	PFOS+PFHxS	0.24-0.58	0.03-0.43	Probably decreasing	94.3%

8.3.4 North (on- and off-base) monitoring wells

Monitoring wells to the north of the base include on and off-base locations are as follows:

- MW156, MW191, MW193 (and alternate well MW190), MW194 and MW195: located on DIA lease area adjacent to Rapid Creek on the base's northern boundary.
- MW185: located off-base, to the north of McMillians Rd adjacent to Rapid Creek
- MW197: located off-base at the FFTA 2 (Source Areas 10)
- MW240, MW241, and MW453: located on-base at CFTA (Source Areas 11).

Historical concentrations of PFOA and PFOS and PFHxS in the north on-base are presented in **Table T2 (Appendix C**) and graphically in **Graph G5** and **G6** (**Appendix D**).

From the graphs a consistent seasonal variability mechanism (e.g. dilution or a first flush) is not noted for any locations. It is noted that concentrations of PFAS are seen to fluctuate by one to two orders of magnitude in locations along Rapid Creek (MW156, MW185, MW191, MW195), though these fluctuations are not in line with a particular season, as concentrations are sometimes seen to peak in the dry season sampling event, whilst other times seen to peak in the wet season sampling event.

The unstable nature of concentrations in groundwater adjacent Rapid Creek is likely linked to the variable nature of PFAS within surface water in Rapid Creek, which is discussed in **Section 8.5.** As set out in **Table 1** (**Section 2.1**)**,** surface water / groundwater interactions are present within the unconfined aquifer along Rapid Creek, and significant changes in standing water levels are observed in groundwater monitoring wells in this area.

The variability in the data set at these locations will likely impact the ability of Mann-Kendall assessments to determine a statistical trend, and potentially the applicability of a result.

All north on-base and off-base monitoring locations reported at least one of PFOA, PFOS or PFHxS concentrations above laboratory detection limits during the reporting period. Analytical results are summarised in **Table 25**.

Monitoring locations generally presented a stable or decreasing trend. On-base locations adjacent to Source Area 11 (MW240, MW241, and MW453) presented the highest concentrations of PFAS of this area. These locations presented stable to potentially decreasing concentrations trends.

As noted in **Section 6.2**, interim PFAS management measures have been implemented at the CFTA to reduce mass flux from the concrete pad. These works may have contributed to these stable to potentially decreasing concentration trend observations. Further works examining the nature and extent of PFAS contamination are being undertaken into Source Area 11 as part of the balance of Site RAP (in development) and remediation investigations (in progress). The completion of these works will further inform the assessment of this source area.

Monitoring locations adjacent to Rapid Creek presented a generally stable or decreasing Mann-Kendall trends. MW156 in this area was noted to have concentrations of PFAS increasing since the historical low concentration was reported in November 2020. Concentrations at MW156 since the November 2020 rebound have been within the range of historical observations for both MW156 and other Rapid Creek groundwater monitoring wells (MW185, MW190, MW191, MW193, MW194, and MW195).

It is noted from **Section 6.3** that work is planned to remediate PFAS impacted soils from the Runway 29 overshoot drain as part of P0009 runway works. Given the overshoot drain feeds into Rapid Creek, and the observed interaction between surface water in Rapid Creek, and groundwater in this area, the completion of these works should have a downward influence on PFAS concentrations in this area.

Table 25 North on-base and off-base Mann-Kendall summary

Location ID	Analyte	Historical range	Current monitoring period	Mann-Kendall trend	
		Min – Max (µg/L)	Min – Max (µg/L)	Trend	Confidence factor
Monitoring locations adjacent to rapid creek					
MW156[%]	PFOA	<LOR-0.52	<LOR-0.16	Decreasing	96.6%
	PFOS+PFHxS	0.58-28.20	0.47-8.72	Decreasing	98.0%
MW185[%]	PFOA	<LOR-0.02	<LOR-0.02	No trend	80.6%
	PFOS+PFHxS	0.01-0.70	0.02-0.38	No trend	84.8%
MW190	PFOA	0.05-0.15	<LOR-0.08	Stable	87.3%
	PFOS+PFHxS	0.99-9.96	0.03-4.39	Probably decreasing	92.2%
MW191[%]	PFOA	0.03-0.15	<LOR-0.05	Probably decreasing	91.6%
	PFOS+PFHxS	1.91-9.8	0.01-3.18	Decreasing	95.9%
MW193	PFOA	0.01-0.08	<LOR-0.01	Decreasing	98.4%
	PFOS+PFHxS	0.94-5	0.13-0.95	Decreasing	99.7%
MW194	PFOA	0.04-0.18	0.04-0.08	Stable	79.1%
	PFOS+PFHxS	2.96-10.63	2.60-4.75	Probably decreasing	91.3%
MW195[%]	PFOA	<LOR-0.03	<LOR-0.02	Stable	62.6%
	PFOS+PFHxS	0.11-4.02	0.09-1.77	Stable	62.6%
Source Area 10					
MW197	PFOA	0.11-0.18	0.12-0.3	No trend	59.0%
	PFOS+PFHxS	6.3-12.00	7.2-23.2	Stable	82.1%
Source Area 11					
MW240	PFOA	3.10-56.00	2.85-8.40	Probably decreasing	92.4%
	PFOS+PFHxS	22.30-360.00	24.70-102.00	No trend	87.5%
MW241	PFOA	1.55-3.60	1.62-3.10	Stable	76.2%
	PFOS+PFHxS	11.10-28.50	9.20-27.00	Stable	54.0%

[%] denotes observation of seasonal variability

8.3.5 Central (on-base) monitoring wells

Monitoring wells in the central base area includes source and down hydraulic gradient monitoring locations. The monitoring locations are summarised as:

- MW115: located at the Former ARFF Fire Station (Source Area 9), where the highest PFAS concentrations are found at the base (Source Area 6)

- MW205: located to the north of FFF 4 (cross hydraulic gradient) and FFF 6 (down hydraulic gradient)
- MW303 and MW133 (and replacement well MW292): located at FFF 4 and FFF 6 (Source Areas 3 and 4)
- MW144: located at the southern base boundary and down hydraulic gradient from the Former ARFF Fire Station, AFFF contaminated soil stockpiles, FFF 4 and FFF 6 (Source Areas 9, 5, 3 and 4 respectively).

Historical concentrations of PFOA and PFOS and PFHxS in the central on-base monitoring wells are presented in **Table T2** (**Appendix C**) and graphically in **Graph G7 and G8** (**Appendix D**).

All central on-base monitoring locations reported PFAS concentrations above laboratory detection limits during the reporting period.

Locations MW115 (Source Area 6) and MW133 (Source Area 4), two of the more heavily impacted groundwater monitoring locations on the base, reported decreasing, probably decreasing, and stable trends for PFAS. Other locations were generally stable. Statistical analysis results are summarised in **Table 26** below.

Given that there may be seasonal influence at monitoring locations MW144, MW205, and MW303, additional Mann-Kendall analysis was completed by separating the data for dry and wet seasons. It is noted that this assessment only considered data which conformed to the accepted end of wet and end of dry monitoring periods. With these data set limitations, between four and six sampling points were considered by each of these six Mann-Kendall assessments.

The results of these assessments are presented in **Table 27** below. Based on the analysis it was observed that both dry and wet seasons were holding a generally stable trend. Due to the limitations of the data set, the results obtained from seasonally filtered testing should be considered to be of low reliability until additional sampling data from future sampling events is collected.

It is noted that Source Area 5 was remediated during the monitoring period which might have contributed to the stable trend noted in MW144, whilst Source Area 3, 4, and 9 within this region of interest are included in a program of further works looking into the nature and extent of PFAS contamination at the base (as detailed in **Section 6.2)**. A Balance of base RAP (in development) and remediation investigations (in progress) will further inform the nature and extent of impacts within this area of the base.

Table 26 Central on-base Mann-Kendall summary

Location ID	Analyte	Historical range	Current monitoring period	Mann-Kendall trend	
		Min – Max (µg/L)	Min – Max (µg/L)	Trend	Confidence factor
MW115	PFOA	68.00-386.00	64.50-309.00	Decreasing	98.2%
	PFOS+PFHxS	1.30-9.50	1.14-3.15	Decreasing	95.4%
MW133	PFOA	39.80-143.90	14.8-56.00	Probably decreasing	93.6%
	PFOS+PFHxS	0.53-1.69	0.27-0.80	Stable	88.6%
MW144[%]	PFOA	2.75-15.90	2.15-6.87	Probably decreasing	90.8%
	PFOS+PFHxS	0.05-0.26	0.03-0.10	Stable	82.3%
MW205[%]	PFOA	0.65-9.00	0.91-6.88	Stable	70.5%
	PFOS+PFHxS	<LOR-0.14	<LOR-0.12	Stable	68.4%
MW303[%]	PFOA	32.00-173.00	32.90-131.00	Stable	82.1%
	PFOS+PFHxS	0.87-4.5	0.84-3.34	Stable	89.1%

[%] denotes observation of seasonal variability

Table 27 Central on-base Mann-Kendall summary – seasonally filtered

Location ID	Analyte	Historical range	Current monitoring period	Mann-Kendall trend	
		Min – Max (µg/L)	Min – Max (µg/L)	Trend	Confidence factor
MW144 dry season	PFOA	4.80–7.90	4.55-6.87	Stable	76.5%
	PFOS+PFHxS	0.06-0.12	0.08-0.10	Stable	50%
MW144 wet season	PFOA	2.55-2.80	2.15-3.69	No trend	40.8%
	PFOS+PFHxS	0.03-0.05	0.03-0.05	Stable	40.8%
MW205 dry season	PFOA	0.99-9.00	1.45-6.88	Stable	50%
	PFOS+PFHxS	<LOR-0.14	<LOR-0.12	Stable	39.3%
MW205 wet season	PFOA	0.65-5	0.91-4.01	Stable	64%
	PFOS+PFHxS	<LOR-0.09	<LOR-0.09	Stable	64%
MW303 dry season	PFOA	129.00	81.30-131.00	Stable	83.3%
	PFOS+PFHxS	3.30	3.00-3.34	Stable	62.5%
MW303 wet season	PFOA	32.00-46.70	32.90-54.90	Stable	88.3%
	PFOS+PFHxS	0.87-1.22	0.84-1.80	No trend	75.8%

8.3.6 Southeast (on-base) monitoring wells

Monitoring wells in the southeast base area include source, and down and cross hydraulic gradient monitoring locations. The monitoring locations are summarised as:

- MW112: located to the north (down hydraulic gradient) of FFF 5
- MW422 and MW235: located at the FFTA 1 (Source Area 1)
- MW139: located directly south (cross hydraulic gradient) of FFTA 1, at the base boundary
- MW141: located at the southern base boundary and is down the inferred hydraulic groundwater gradient from the FFTA 1 and FFF 5
- MW297: located at the FFF 5 (Source Area 2).

Monitoring location MW235 has been sampled since September 2022 as an alternative monitoring location to MW422 after it became inaccessible in September 2022. MW422 monitors Source Area 1 which is being remediated during the monitoring period (discussed in **Section 6.2**). MW422 historically reported higher concentrations than observed at MW235. This is expected as MW422 is located immediately adjacent to Source Area 1. The completion of these remediation works and their associated validation works will further inform the nature and extent of PFAS concentrations in this source area.

It is noted that concentrations trends at MW422 had been increasing up until the well's last available sampling event in March 2022. Following the completion of remedial works, ongoing monitoring of MW422 (or a suitable replacement well if this well has not been preserved during the remedial works program) will allow for the assessment of the effect of the remediation on PFAS concentrations in groundwater. In the absence of MW422 data, ongoing monitoring of MW235, as well of monitoring locations down hydraulic gradient from MW422 (MW141 and MW180 [presented in **Section 8.3.3**]) would reduce uncertainty in the vicinity of the source area.

Historical concentrations of PFOA and PFOS and PFHxS in the southeast on-base monitoring wells are presented in **Table T2** (**Appendix C**) and graphically in **Graph G9** and **G10** (**Appendix D**). All southeast on-base monitoring locations reported concentrations of at least one compound of PFOS,

PFOA or PFHxS above laboratory detection limits during the reporting period. The observed trends indicate that wells MW139 and MW297 are seasonally influenced, with concentrations increasing through the dry season, and decreasing in the wet season possibly indicating a dilution mechanism. For these locations, an additional pair of Mann-Kendall assessments were completed, filtering dry and wet season observations separately.

From the full data set Mann-Kendall assessment (summarised in **Table 28)**, whilst PFOA concentrations at MW141 remain below the LOR, PFOS+PFHxS was assessed to be probably increasing. The concentration increases observed at MW141 during the monitoring period only constitute a minor (0.05 µg/L of PFOS+PFHxS) increase against historical observations at MW141, and remain below the historical ranges of groundwater concentrations of PFOA, and PFOS and PFHxS compared against MW180 (located nearby, down / cross hydraulic gradient of MW141, off-base, and within a residential setting, discussed above in **Section 8.3.3**). As such this probably increasing trend does not constitute a change in CSM for this area.

MW112 and MW139 reported decreasing PFOA, and PFOS + PFHxS concentration trends. From the seasonally filtered dataset monitoring locations generally held a stable trend, with MW139 dry season concentrations recording a decreasing trend for PFOS+PFHxS. It is noted that this assessment only considered data which conformed to the accepted end of wet and end of dry monitoring periods.

With these dataset limitations, between four and six sampling points were considered by each of these six Mann-Kendall assessments. This is less than the ideal minimum of seven observations (and in some cases just above the absolute minimum of four observations) required by the Mann-Kendall statistical assessment method. As such the results obtained from seasonally filtered testing should be considered to be of lower reliability until additional sampling data from future sampling events is collected. Seasonally filtered Mann-Kendall summary is summarised in **Table 29** below.

Table 28 Southeast on-base Mann-Kendall summary

Location ID	Analyte	Historical range	Current monitoring period	Mann-Kendall trend	
		Min – Max (µg/L)	Min – Max (µg/L)	Trend	Confidence factor
MW112	PFOA	0.13-0.34	0.15-0.32	Probably decreasing	90.8%
	PFOS+PFHxS	8.50-28.50	8.23-21.80	Decreasing	97.1%
MW139[%]	PFOA	<LOR-0.07	<LOR-0.04	Decreasing	95.4%
	PFOS+PFHxS	0.56-6.40	0.41-2.26	Decreasing	98.8%
MW141	PFOA	<LOR	<LOR	Stable	47.6%
	PFOS+PFHxS	0.21-0.40	0.30-0.45	Probably increasing	94.3%
MW297[%]	PFOA	0.11-1.31	0.02-1.04	No trend	78.4%
	PFOS+PFHxS	5.80-76.30	1.44-41.80	No trend	70.0%
MW422	PFOA	1.04-1.51	1.31-12.50	Increasing	97.2%
	PFOS+PFHxS	59.20-81.60	73.00-328.00	No trend	64.0%

[%] denotes observation of seasonal variability

Table 29 Southeast on-base Mann-Kendall summary – seasonally filtered

Location ID	Analyte	Historical range	Current monitoring period	Mann-Kendall trend	
		Min – Max (µg/L)	Min – Max (µg/L)	Trend	Confidence factor
MW139	PFOA	0.02-0.06	0.03-0.04	Stable	64%

Location ID	Analyte	Historical range	Current monitoring period	Mann-Kendall trend	
		Min – Max (µg/L)	Min – Max (µg/L)	Trend	Confidence factor
dry season	PFOS+PFHxS	2.31-5.7	2-2.26	Decreasing	99.9%
MW139 wet season	PFOA	<LOR-0.01	<LOR-0.01	Stable	39.3%
	PFOS+PFHxS	0.56-0.71	0.41-0.66	Stable	57%
MW297 dry season	PFOA	1.31	0.49-1.04	Stable	62.5%
	PFOS+PFHxS	76.3	30.6-41.8	Stable	37.5%
MW297 wet season	PFOA	0.11-0.15	0.02-0.05	Stable	82.1%
	PFOS+PFHxS	5.8-9.78	1.44-3.6	Stable	88.3%

8.4 Surface water results

8.4.1 Overview

A comparison of PFOA and PFOS+PFHxS concentrations in surface water to the assessment criteria is presented in figure series **Figure F5** in **Appendix A**. PFOS, PFOA or PFHxS concentrations were detected in surface water monitoring locations both on-base and off-base down gradient from the base (and associated on-base PFAS source areas).

The highest PFAS concentrations reported for the monitoring period were detected within off-base drains leading from the base. PFOS+PFHxS concentrations within surface water are higher than PFOA concentrations. The maximum concentration of PFOA was detected at SW300 (off-base drain from CFTA (Source Area 11)) at 0.36 µg/L in April 2023. The maximum concentrations of PFOS+PFHxS reported during the monitoring period are listed below. The results have been sorted based on surface water areas, in line with temporal trend discussions presented in **Section 8.5** below.

- Rapid Creek (freshwater), 3.7 µg/L at SW104 located north of the eastern end of Larkin Avenue (March 2023)
- Rapid Creek (estuarine), 0.96 µg/L at SW112 within the Rapid Creek mangrove forest (December 2020)
- Rapid Creek catchment (surface drains), 5.37 µg/L at SW114 located north of Larkin Avenue, within a north flowing drain (March 2023)
- Rapid Creek catchment (on-base source areas), 2.52 µg/L at SW312 from drainage at FFTA 1 (Source Area 1) (March 2023)
- Ludmilla Creek catchment, 4.6 µg/L at SW125 located at a drain outlet west of Nemarluk Drive (March 2023)
- Reichardt and Sadgroves Creek catchments, 0.37 µg/L at SW143 monitoring discharge from Sadgroves Creek (December 2020)

Reported concentrations of PFOS+PFHxS and/or PFOA exceeded previous maximum concentrations at six locations during the monitoring period. The current monitoring period new maximum concentrations compared to the historic maximum concentrations are listed as follows:

- SW104 (PFOS:2.46 ug/L in March 2023 from 2.08 ug/L in Apr 2020, PFOS+PFHxS: 3.7 ug/L in March 2023 from 3.57 ug/L in Apr 2020)
- SW113 (PFOS: 0.39 ug/L in January 2022 from 0.38 ug/L in March 2018, PFOS+PFHxS: 0.59 ug/L in January 2022 from 0.54 ug/L in March 2018)
- SW124 (PFOS: 0.59 ug/L in Jan 2022 from 0.06 ug/L in January 2020, PFOS+PFHxS: 0.76 ug/L in January 2022 from 0.09 ug/L in January 2020)

- SW156 (PFOS: 0.56 ug/L in March 2023 from 0.38 ug/L in March 2018, PFOA: 0.04 ug/L in March 2023 from LOR in January 2018)
- SW178 (PFOS: 0.34 ug/L in Jan 2022 from 0.04 ug/L in March 2019, PFOS+PFHxS: 0.38 ug/L in January 2022 from 0.04 ug/L in March 2019)
- SW181 (PFOS: 0.96 ug/L in Mar 2023 from 0.57 ug/L in March 2018, PFOS+PFHxS: 1.04 ug/L in March 2023 from 0.64 ug/L in March 2018)

Of the new maximum concentrations recorded, only the result at SW104 represents a new maximum for a given area (an increase of ~4%), whilst all other new maximums are within the historic range for the surface water area. The significance of this variation is discussed further based on areas in **Section 8.5** below.

In addition to the six locations above, two on-base locations (SW152, SW312) and one off-base location (SW300) were included in OMP monitoring for the first time during the monitoring period. These locations recorded concentrations of PFOS, PFOA or PFHxS greater than the LOR. All three locations exceeded of ecological criteria, whilst SW300 and SW312 also exceeded human health criteria (details in **Section 7.2.3**).

Of these monitoring locations, SW152 and SW312 are in the eastern on-base region, within the existing Management Area. Surface water monitoring has historically been completed as part of the OMP in the vicinity of these locations and the results obtained do not represent a change from the historic dataset for this area.

SW300 is located off-base, at a drain leading from the on-base CFTA (Source Area 11). Surface water results had not previously been obtained from drains from the CFTA, though surface drains within the Rapid Creek catchment have historically been sampled (discussed in **Section 8.5.3** below). The PFAS results obtained from SW300 are within the historical range seen within these locations.

With the above exceptions considered, the overall surface water condition remains consistent with previous assessments, as concentrations of PFAS generally remain within historical observations, with limited outliers.

8.5 Surface water temporal trends

Temporal graphs are presented in **Appendix D** for PFOA and PFOS+PFHxS concentrations in surface water at the following selected areas:

- Rapid Creek (freshwater): 6 monitoring locations
- Rapid Creek (estuarine water): 2 monitoring locations
- Rapid Creek catchment (surface drains): 4 monitoring locations
- Rapid Creek catchment (on-base Source Areas): 5 monitoring locations
- Ludmilla Creek catchment: 4 monitoring locations
- Reichardt and Sadgroves Creek catchments: 4 monitoring locations.

A summary of historical surface water concentrations of PFOA and PFOS+PFHxS alongside average daily rainfall are displayed graphically as temporal trends for the areas outlined in **Table 30** below.

Table 30 Summary of surface water monitoring areas

Graph ID	Area	Monitoring locations
G11 and G12	Rapid Creek (freshwater)	SW101 (and alternate SW152), SW104, SW106, SW108, SW109
G13 and G14	Rapid Creek (estuarine water)	SW112, SW113
G15 and G16	Rapid Creek catchment (surface drains)	SW114, SW115, SW168, SW300

Graph ID	Area	Monitoring locations
G17 and G18	Rapid Creek catchment (on-base Source Areas)	SW156, SW170, SW178, SW181, SW312
G19 and G20	Ludmilla Creek catchment	SW120, SW124, SW125, SW160
G21 and G22	Reichardt and Sadgroves Creek catchments	SW132, SW133, SW143, SW162

8.5.1 Rapid Creek freshwater

Five surface water monitoring locations are located between the upper reach of Rapid Creek adjacent to the end of eastern runway and McMillians Road. These locations monitor PFAS concentrations within the upper portions of Rapid Creek. The locations are:

- SW101 (and alternate location SW152): located at the end of the eastern runway
- SW104: located north of the eastern end of Larkin Avenue
- SW106: located at the base of a constructed rapid northeast of Sir Norman Brearley Drive
- SW108: located west of where Henry Wrigley Drive crosses over Rapid Creek
- SW109: located south of McMillans Road and east of Charles Eaton Drive.

Historical concentrations of PFOA and PFOS+PFHxS in surface water from the upper reach of Rapid Creek are presented in **Table T4** (**Appendix C**) and graphically in **Graph G11** and **G12** (**Appendix D**). It is noted that SW152 had not been sampled prior to this monitoring period.

All Rapid Creek freshwater monitoring locations reported PFAS concentrations above laboratory LORs in at least one sample event during the reporting period. Generally, PFAS concentrations remained within historical concentration ranges throughout the monitoring period, with the exception of SW104 (for PFOS+PFHxS).

PFAS concentrations were generally observed to fluctuate across the wet season. Generally, concentrations were higher at the end of the wet season then during the start of the wet season. This suggests that PFAS is mobilised from on-base sources by rainfall to Rapid Creek freshwaters as the season progresses.

It is noted that remedial activities both ongoing and proposed at the base are anticipated to reduce the long-term mass flux from the base into Rapid Creek. Notable remedial work in this area includes the planned clean out of the Runway 29 overshoot drains, which feeds into these sampling locations. Monitoring in line with the completion of these works will inform the nature and extent of contamination post remedial works.

8.5.2 Rapid Creek estuarine water

Two surface water monitoring locations are located in the lower reach of Rapid Creek. These locations monitor PFAS concentrations within the lower portions of Rapid Creek. The locations are:

- SW112: located within the Rapid Creek mangrove forest east of Rapid Creek Road
- SW113: located east of the Rapid Creek foot bridge north of Casuarina Drive.

Historical concentrations of PFOA, PFOS and PFHxS in surface water from the lower reach of Rapid Creek are presented in **Table T4** (**Appendix C**) and presented graphically in **Graph G13** and **G14** (**Appendix D**).

All Rapid Creek estuarine monitoring locations reported PFAS concentrations above laboratory detection limits at least once during the reporting period. PFAS concentrations remained within an order of magnitude of historical concentration ranges, experiencing minor increases during the wet season peaks (peaking in December 2020 at SW112, and in January 2022 at SW113) within the monitoring period. PFAS concentrations are observed to have seasonal variability, with increases noted as the wet season progresses, in line with upgradient surface locations. The PFAS concentrations within the

estuarine waters are lower than those in Rapid Creek fresh waters, likely due to mixing of freshwater and saltwater within the estuarine zone.

8.5.3 Rapid Creek catchment surface drains

Three surface water locations monitor stormwater runoff from the base and DIA via surface drainage features to Rapid Creek. The locations are:

- SW114: located within a north flowing drainage on the north side of the eastern portion of Larkin Avenue
- SW115: Located within a north flowing drainage on the north side of the western portion of Larkin Avenue
- SW168: Located within a drainage that flows under Charles Eaton Drive, between Murphy Drive and Charles Eaton Drive
- SW300: Located at the drain from CFTA (Source Area 11).

Historical concentrations of PFOA, PFOS and PFHxS in surface water from the Rapid Creek catchment surface drains are presented in **Table T4** (**Appendix C**) graphically in **Graph G15** and **G16** (**Appendix D**). It is noted that SW300 had not been sampled prior to November 2022, but since then has been sampled five times, as it has been included in the monthly surface water sampling events.

Rapid Creek catchment surface drain monitoring locations SW114, SW115, SW168, and SW300, reported PFAS concentrations above laboratory detection limits at least once during the reporting period. PFAS concentrations generally remained within historical concentration ranges during the monitoring period. PFAS concentrations are observed to increase after the start of the wet season. This seasonality was best seen in PFOS+PFHxS temporal trend **Graph G16**. It was noted that the concentrations seen at these surface drains are higher than that seen within the receiving waters of Rapid Creek. This is likely due to dilution of contamination into Rapid Creek waters.

8.5.4 Rapid Creek catchment on-base source areas

Five surface water locations monitor stormwater runoff from source areas. The locations are:

- SW156: located adjacent to the CFTA (Source Area 11)
- SW170: located north of the FFTA 1 (Source Area 1) and in the main southern drain discharging to Rapid Creek
- SW178: located at FFF 5 (Source Area 2)
- SW181: located north of FFF 4 (Source Area 3)
- SW312: drainage from FFTA 1 (Source Area 1).

Historical concentrations of PFOA and PFOS and PFHxS in surface water from the Rapid Creek catchment on-base source areas are presented in **Table T4** (**Appendix C**), and graphically in Graphs **G17** and **G18** (**Appendix D**).

All on-base source area monitoring locations within the Rapid Creek catchment reported concentrations of at least one of PFOA, PFOS, or PFHxS above laboratory LORs at least once during the monitoring period.

PFAS concentrations obtained during the monitoring period remained within an order of magnitude of historical results. From review of the temporal trend graphs, concentrations in this region were seen to fluctuate with no consistent pattern related to wet or dry seasons. This indicates that the PFAS concentrations in surface water adjacent to on-base source areas is variable.

New monitoring location SW312 at the drainage from Source Area 1 reported PFOA and PFOS+PFHxS concentrations higher than reported at other locations within this monitoring group. With no historical data for this sampling location, the temporal significance of the results will be assessed when additional data is collected during future monitoring events as part of the OMP.

Note that remedial works have been ongoing at Source Area 1 during this monitoring period. Further monitoring of this area will provide guidance on the impact of these works on the nature and extent of PFAS in surface water in this area.

8.5.5 Ludmilla Creek catchment

Four surface water monitoring locations are located in Ludmilla Creek. The locations are:

- SW120: located on the east side of where Ludmilla Creek flows under Dick Ward Drive
- SW124: located where Ludmilla Creek enters Darwin Harbour at the end of Colivas Road
- SW125: located at a drain outlet that empties out from beneath the west side of the south end of Nemarluk Drive
- SW160: located on-base, at a stormwater pipe connected to airside operations, upgradient from Ludmilla Creek catchment.

Historical concentrations of PFOA and PFOS and PFHxS in surface water from the Ludmilla Creek are presented in **Table T4** (**Appendix C**) and graphically in **Graph G19** and **G20** (**Appendix D**).

All Ludmilla Creek monitoring locations reported PFAS concentrations above laboratory LORs at least once during the reporting period. PFAS concentrations ranged within an order of magnitude of the historical concentrations during the monitoring period.

The highest concentrations of PFAS in this area were reported in SW125 on the western boundary of the base, which was the only sampling location with PFAS concentrations exceeding recreational human health criteria (NHMRC, 2019). During the monitoring period the PFOS+PFHxS concentration ranged between 3.45 µg/L and 4.60 µg/L, which were lower than the historical maximum of 10.2 µg/L reported in March 2018 for the location.

Seasonal variability in PFAS concentrations was observed for SW124 and SW120. Concentrations of PFAS at both locations remained below human health criteria for the monitoring period.

8.5.6 Reichardt and Sadgroves Creek catchments

Four surface water locations monitor the Reichardt and Sadgroves Creek catchments. These locations are:

- SW132 and SW133: monitoring surface water discharging to Reichardt Creek
- SW143: monitoring surface water discharging to Sadgroves Creek
- SW162: monitoring storm water leaving the base's southern boundary.

Historical concentrations of PFOA and PFOS and PFHxS in surface water from the Reichardt and Sadgroves Creek catchments are presented in **Table T4** (**Appendix C**) and graphically in **Graph G21** and **G22** (**Appendix D**).

All Reichardt and Sadgroves Creek catchments monitoring locations reported PFAS concentrations above laboratory detection limits at least once during the reporting period. PFAS concentrations in this area remain below historical observations. Seasonal variability is not observed at these locations. Concentrations of PFAS at these locations remained below recreational human health criteria (NHMRC, 2019), for the monitoring period.

8.6 Aquatic biota

The monitoring data in **Table 31** below presents the aquatic biota concentrations gathered across the Interim and OMP monitoring events and that have been collected from Rapid Creek freshwater locations BIOFA024, BIOFA026 and BIOFA028; Rapid Creek estuarine location BIOFA007; Ludmilla Creek upper estuarine location BIOFA016; and BIOFA018 Ludmilla Creek lower estuarine location. Monitoring activities are summarised in the Factual Reports provided in **Appendix B**.

The aquatic biota analytical PFAS results from the November 2020 to October 2022 sampling events, and the interim and historical monitoring for each target aquatic biota group (including opportunistic catch species) are summarised in **Table T5** (**Appendix C**) of this report.

Concentrations of PFOA in all sampled fish and crustaceans were below the adopted screening criteria for aquatic biota Department of Health (2019) during the monitoring period. Concentrations of PFOA did not exceed the limit of reporting across all OMP monitoring with exception to molluscs and crustaceans. Concentrations of PFOS and PFHxS exceeded the adopted screening criteria for aquatic biota of 0.065 mg/kg for crustaceans and 0.0052 mg/kg for finfish Department of Health (2019) at monitoring locations:

- BIOFA007
  - Two scat (Scatophagus sp.) in November 2021: 0.008 and 0.009 mg/kg
  - One Barramundi (Lates calcarifer) in October 2022: 0.008 mg/kg
  - One Forktail Catfish 1 (Neoarius sp.1) in October 2022: 0.011 mg/kg
  - Two Forktail Catfish 2 (Neoarius sp.2) in October 2022: 0.03 and 0.36 mg/kg
  - One Sea Mullet (Mugil cephalus) in October 2022: 0.009 mg/kg
- BIOFA018
  - One Barramundi (Lates calcarifer) in November 2021: 0.01 mg/kg
  - Three forktail Catfish 1 (Neoarius sp.1) in November 2021: 0.048, 0.009 and 0.031 mg/kg
  - One Scatt (Scatophagus sp.) in November 2021: 0.009 mg/kg
  - Two sea mullets (Mugil cephalus) in October 2022: 0.047 and 0.008 mg/kg
- BIOFA026
  - One redclaw crayfish (Cherux quadricarinatus) composite in October 2022: 0.078 mg/kg
- BIOFA028
  - Two redclaw Crayfish (Cherux quadricarinatus) composite in November 2021: 0.065 and 0.068 m/kg
  - One redclaw Crayfish (Cherux quadricarinatus) composite in October 2022: 0.139 mg/kg

Of the 162 aquatic biota samples analysed during the reporting period, 17 analysed samples had concentrations above the screening criteria, accounting for roughly ten percent of all analysed samples.

Sample locations BIOFA026 and BIOFA028, both located within Rapid Creek, reported new exceedances of the screening criteria for redclaw crayfish in October 2022 and November 2021 sampling events, respectively. In each case the new exceedances were within an order of magnitude of previous results from the same species from these same locations.

Note that a redclaw crayfish collected from location BIOFA028 in October 2022 reported a new maximum concentration of 0.139 mg/kg for PFOS+PFHxS. However, redclaw crayfish analysed during the investigative period in April 2017 reported PFOS+PFHxS concentration of 0.142 mg/kg from a location within Rapid Creek, indicating the new maximum reported in the specific sampling location of BIOFA028 is consistent with historical sampling results for redclaw crayfish in Rapid Creek.

The risks associated with consuming aquatic biota remain similar to conditions described in the Human Health Risk Assessment (HHRA) (Coffey, 2018c). Sampling of aquatic biota is primarily to inform NT Department of Health to keep health advisories up to date.

The bioaccumulation of PFAS in aquatic biota will continue to be monitored through the OMP sampling.

The analytical results for diadromous and estuarine fish species, crustaceans and molluscs are presented in **Table 31** below. Historical, Interim monitoring and OMP analytical results can be found in **Table T5** in **Appendix C**.

Table 31 Biota monitoring PFAS summary results (mg/kg)

Target Species	Analyte	Historical range	Interim monitoring	OMP monitoring		
			Dec-18 to Jan 19	November 20	November 21	October 22
BIOAFA024 / BIOAFA026 / BIOAFA028						
Crustaceans	PFOS+ PFHxS	0.079	0.0234 – 0.063	0.002 – 0.011	0.016 – 0.068	ND – 0.139
	PFOS	0.059	0.015 – 0.049	ND – 0.003	0.011 – 0.047	ND – 0.115
	PFOA	0.0011	0.0006 – 0.0008	ND	ND	ND – 0.002
BIOAFA016						
Molluscs	PFOS+ PFHxS	0.010 - 0.118	0.0102– 0.0261	ND – 0.004	0.007 – 0.012	0.004 – 0.018
	PFOS	0.0081 - 0.065	0.0096 – 0.024	ND – 0.002	0.007 – 0.012	0.004 – 0.016
	PFOA	0.0034 - 0.018	ND – 0.011	ND – 0.008	ND – 0.004	ND – 0.003
BIOAFA007						
Diadromous or estuarine fish[1]	PFOS+ PFHxS	0.0115 - 0.5	0.0023 – 0.0269	ND – 0.004	ND – 0.009	ND – 0.036
	PFOS	0.011 - 0.036	0.0023 – 0.026	ND – 0.004	ND – 0.009	ND – 0.035
	PFOA	ND	ND	ND	ND	ND
BIOAFA018						
Diadromous or estuarine fish[1]	PFOS+ PFHxS	ND - 0.014	0.0018 – 0.0062	ND – 0.001	ND – 0.048	ND – 0.047
	PFOS	ND - 0.014	0.0018 – 0.0062	ND – 0.001	ND – 0.039	ND – 0.047
	PFOA	ND	ND	ND	ND	ND – 0.001

[1] Includes non-target fish species
ND = Not detected above laboratory limits of reporting

9.0 Conceptual site model

The CSM was developed during the investigation stages (Coffey, 2018a) and summarised in the PMAP (Defence, 2019). The CSM summarises the linkages between sources, exposure pathways and receptors.

The OMP monitoring over the monitoring period November 2020 to June 2023 discussed in this report has provided additional data to further understand the nature and extent of PFAS concentrations in groundwater, surface water and biota. Key observations included:

- PFAS concentrations were generally within historical ranges.
- Mann-Kendall trend analysis of groundwater monitoring data from different locations indicated variable trends, including stable, decreasing, increasing or inconclusive trends. Increasing trends were limited to two on-base locations:
    - MW103 at Source Area 9: Subject to additional investigation through the development of a Site RAP and ongoing remediation investigations. The completion of these works will further inform the assessment of contamination results at this location.
    - MW422 at Source Area 1: Ongoing remedial works have been conducted at Source Area 1 during the monitoring period, the impact of which will be subject to post remediation monitoring.
- Concentrations of PFAS remain highest in the vicinity of the on-base source areas, with Source Areas 1, 4, 6 and 11 recording the highest PFAS concentrations within the Management Area. Of these, Source Area 6 is the only source not outlined for ongoing remedial works or assessment.
    - Source Area 6 is noted to have a decreasing PFAS concentration trend.
- Concentrations of PFAS in groundwater are generally lower off-base compared to on-base areas.

While minor variations to the nature and extent of the PFAS plume and concentrations have occurred, the PFAS transport mechanisms are unchanged, and changes to concentrations across the monitoring extent have not constituted changes to the risk profile for the base. The concentration range reported for groundwater and surface water monitoring locations for the monitoring period are shown in figure series **Figure F4** and **Figure F5** (**Appendix A**).

When compared to the available historical dataset, the additional OMP data indicates that the nature and extent of PFAS impacts in groundwater and surface water is largely unchanged since the CSM was developed in the DSI (Coffey, 2018a).

The data presented in this report do not change the overall assessment of CSM sources, pathways and/or receptors as described during the investigation stages (Coffey, 2018a) (Coffey, 2018b) and summarised in the PMAP (Defence, 2019).

10.0 Discussion

10.1 Risk profile review

The data collected during OMP monitoring between November 2020 and March 2023 when combined with the 2018 – 2019 interim monitoring and 2019-2021 OMP monitoring suggest that the risk profile to human health and ecological receptors within the base and off-base Management Area is overall unchanged since the publication of the HHRA (Coffey, 2018c). This is based on the following assessment of the OMP data:

Groundwater

- **Nature and extent of groundwater PFAS impacts:** The nature and extent of PFAS concentrations in groundwater were generally similar to the 2020 AIR (AECOM, 2020) with the highest concentrations reported at on-base Source Areas 1, 4, 6, and 11. Peak off-base groundwater concentrations of PFAS are typically one to two orders of magnitude lower than seen in these on-base source area results.
- **Areas of groundwater PFAS concentration change:** For the monitoring period it is seen that the change in groundwater PFAS concentrations are limited and do not constitute a change in risk profile for the base or the surrounding management zones. The fundamentals of the previously derived CSM are generally supported by the data collected over the monitoring period, as discussed in **Section 9.0**. Where new exceedances of criteria have been observed during the monitoring period, these exceedances are noted to be at wells with no previous monitoring, in regions where exceedances of the same order of magnitude are already present, as such the reported concentrations do not constitute a change in risk for the regions.

Surface water

- **Nature and extent of surface water PFAS impacts:** Concentrations of PFOS and PFHxS remain similar to previous results throughout the Management Area, with reported concentrations generally staying within historical ranges and the conditions within the Management Area are generally unchanged from the findings of the HHRA (Coffey, 2018c). All locations reported PFAS concentrations below all guideline values for recreational water (NHMRC, 2019) with the exception of the following five monitoring locations: SW104 and SW114 within the Rapid Creek catchment, SW125 within the Ludmilla Creek catchment, SW300 from perched flow from the CFTA (Source Area 11) drains toward Rapid Creek catchment, and SW312 from drainage at FFTA 1 (Source Area 1). Locations SW104, SW114 and SW125 have historically been above the recreational guideline and therefore this observation does not suggest a change in the risk profile. SW300 and SW312 are new monitoring locations to the OMP and are discussed as follows.
- **Areas of surface water PFAS concentration change:** SW300 and SW312 are new monitoring locations, first monitored in November 2022. These new concentration exceedances are not seen to constitute changes in the risk profile as concentrations of PFAS at SW300 are similar to other surface water concentrations within the Rapid Creek catchment surface drains grouping (notably including SW114 which has historically exceeded criteria), whilst SW312 is located on-base adjacent a source area (notably remediated during the monitoring period), and it is considered that the receiving discharge point from the base from SW312 has already been considered within the OMP.

Aquatic biota

- **PFAS impacts**: Concentrations of **PFOS** and PFHxS in aquatic biota sampled between November 2020 and October 2022 were all below the adopted screening criteria for aquatic biota (Department of Health, 2019) with the exception of 15 samples. The results over the monitoring period are similar to previous monitoring events and conditions described in the HHRA (Coffey, 2018c) for sampled biota including fish, crustaceans, and/or molluscs with PFOS and PFHxS concentrations above the adopted screening criteria for aquatic biota.
- **Risks**: The risks associated with consuming aquatic biota remain similar to conditions described in the Human Health Risk Assessment (HHRA) (Coffey, 2018c). Sampling of aquatic biota is primarily

to inform NT Department of Health to keep health advisories up to date regarding PFAS concentrations in aquatic biota within the Management Area.

10.2 Assessment of current OMP

Based on the above review of the data collected during the current monitoring period, there are no significant changes to the understanding of the nature, extent or risks associated with PFAS at the base or within the Management Area, or the need for monitoring of additional media. It is also understood that no significant OMP updates are required arising from stakeholder engagement or changes in land use.

Based on this, there are no triggers to the requirement of a review of the OMP (Defence, 2019a). However, since the development of the OMP, the following updated guidance has been published and adopted, and should be included in the next revision of the OMP:

- Recreational water use (NHMRC [2019], PFAS Recreational Water guidelines)
- Groundwater and surface water ecological guidelines (HEPA [2020], PFAS NEMP freshwater 99% species protection).

Additionally, the revised OMP will also include the recommended changes to the SAQP's sampling locations where required, due to access restrictions, damaged monitoring wells or wells that could not be located, as identified in the factual reports and summarised in **Table 4**. These additional recommendations are provided separate to this report.

11.0 Conclusions

Groundwater, surface water and aquatic biota monitoring were completed between November 2020 and March 2023 in accordance with the SAQP (AECOM, 2023a).

The results for the monitoring period indicate that the nature and extent of PFAS in groundwater, surface water and aquatic biota are consistent with previous findings.

Fluctuations in PFAS concentrations were observed and likely due to the seasonal variability of Darwin's wet and dry seasons. Concentrations of PFAS in groundwater are generally stable or decreasing. Where concentrations have been detected to have increasing trends, it is noted that these areas (namely at MW103 and MW422) are the focus of remedial activities (either proposed or ongoing).

The CSM was reviewed, and based on the results presented within this report, no changes were identified to source, pathway or receptors at the base and within the Management Area.

Based on the data collected during the monitoring period, the risk profile has not changed within the Management Area.

The monitoring conducted over the monitoring period is considered to have met the objectives of the SAQP and the OMP. The groundwater monitoring network is considered generally appropriate and sufficient for the program objectives, with the following observations:

- The groundwater monitoring well network has limited coverage to the northwest of Source Area 7, 8, and 9. Monitoring of non OMP locations in this direction would remove uncertainty.
- The well monitoring Source Area 7 (MW405) was destroyed following the April 2020 monitoring event by construction activities in the area. Sampling of down hydraulic gradient wells not currently sampled under the OMP would reduce uncertainty in this area.
- Remedial works being undertaken during the monitoring period have limited access to the well monitoring Source Area 1 (MW422). Monitoring of down hydraulic gradient wells not currently sampled under the OMP would reduce uncertainty in this area.

12.0 References

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Appendix A

Figures

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.5 1 2

Kilometres

1:45,000 (when printed at A3)

LEGEND

- Drainage
- Highway
- Management Area
- RAAF Base Darwin
- Source Area

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
03	Former fuel farm 4
04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report (November 2020 – June 2023)

Management Area

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 14 AUG 2023
VERSION:	1

Figure

F1

Filename: \\na.aecomnet.com\lfs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF1_RAAFDarwin_IR23_ManagementArea_A3L_230707.mxd

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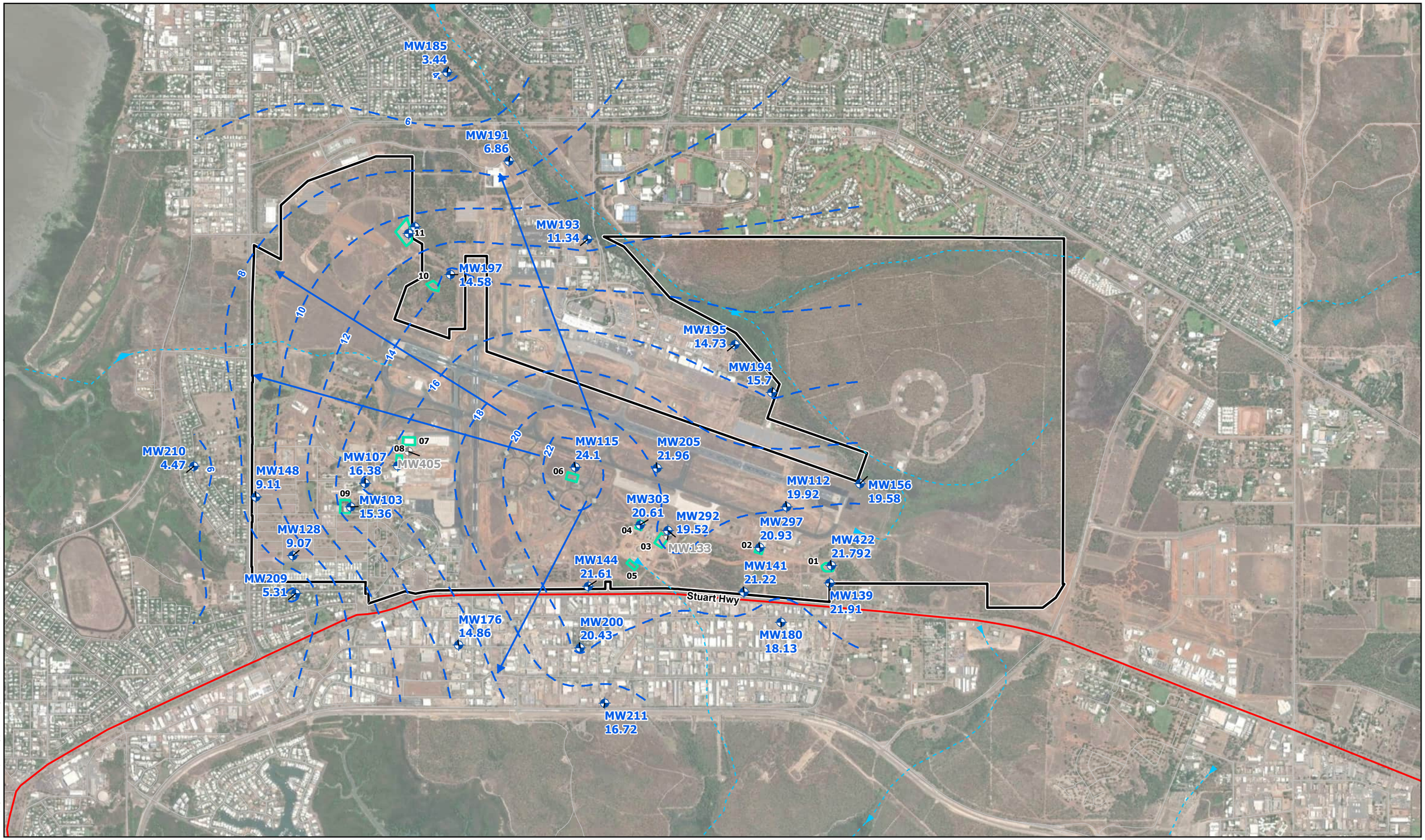

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.3 0.6 1.2
Kilometers

1:25,000 (when printed at A3)

Legend

- Groundwater Monitoring Locations
- Monitoring Locations (Day/Damaged/Inaccessible)
- 175-44 Inferred Groundwater Level
- Groundwater Flow Direction
- Inferred Groundwater Level
- Drainage
- Highway
- Road
- Source Area
- RAAF Base Darwin

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
03	Former fuel farm 4
04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report (November 2020 – June 2023)
Inferred Groundwater Contours November 2020

PROJECT ID 60612561
CREATED BY JIANJ
LAST MODIFIED JIANJ14 AUG 2023
VERSION: 1

Figure
F2A

A3 size

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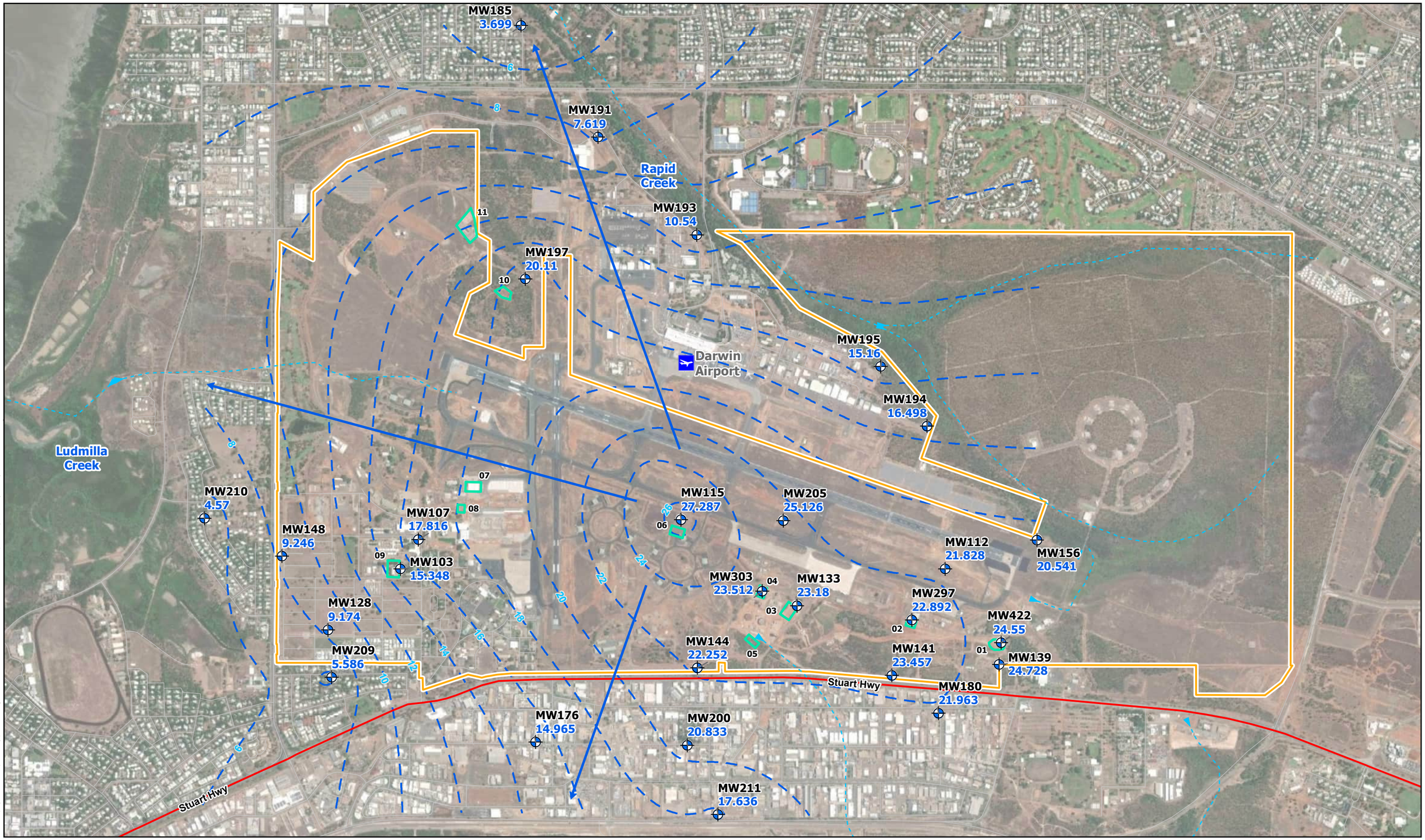

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.2 0.4 0.8
Kilometers

1:20,000 (when printed at A3)

Legend

- Groundwater Monitoring Locations
- Inferred Groundwater Direction
- Inferred Groundwater Level
- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
03	Former fuel farm 4
04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Inferred Groundwater Contours
March 2021

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 14 AUG 2023
VERSION:	1

Figure
F2B

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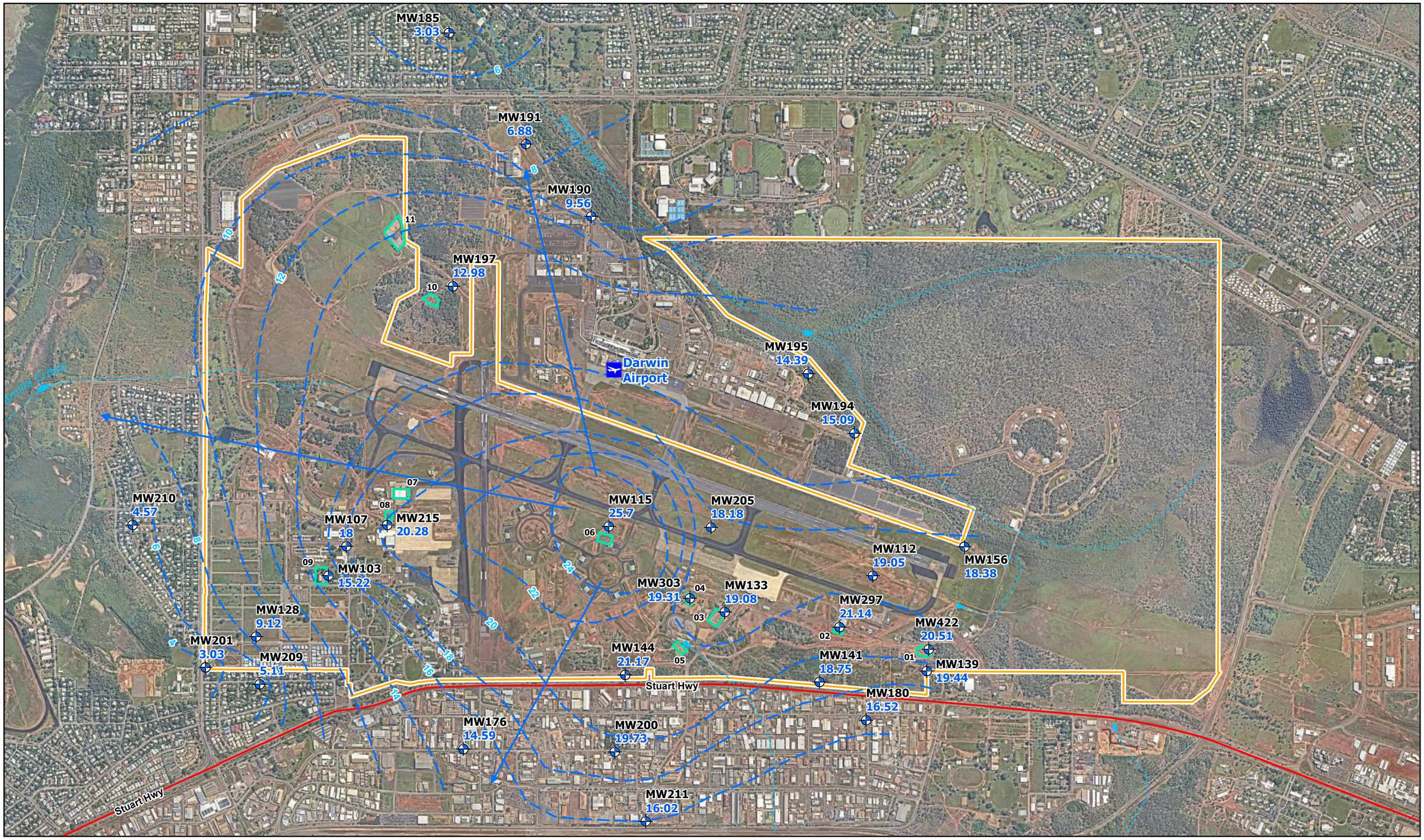

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000

Metres

1:20,000 (when printed at A3)

Legend

- Groundwater Monitoring Location
- Inferred Groundwater Level
- Inferred Groundwater Direction
- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
03	Former fuel farm 4
04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) 2021 Nearmap

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Inferred Groundwater Contours
November 2021

PROJECT ID 60612561
CREATED BY KD
LAST MODIFIED JIANJ 14 AUG 2023
VERSION: 1

Figure
F2C

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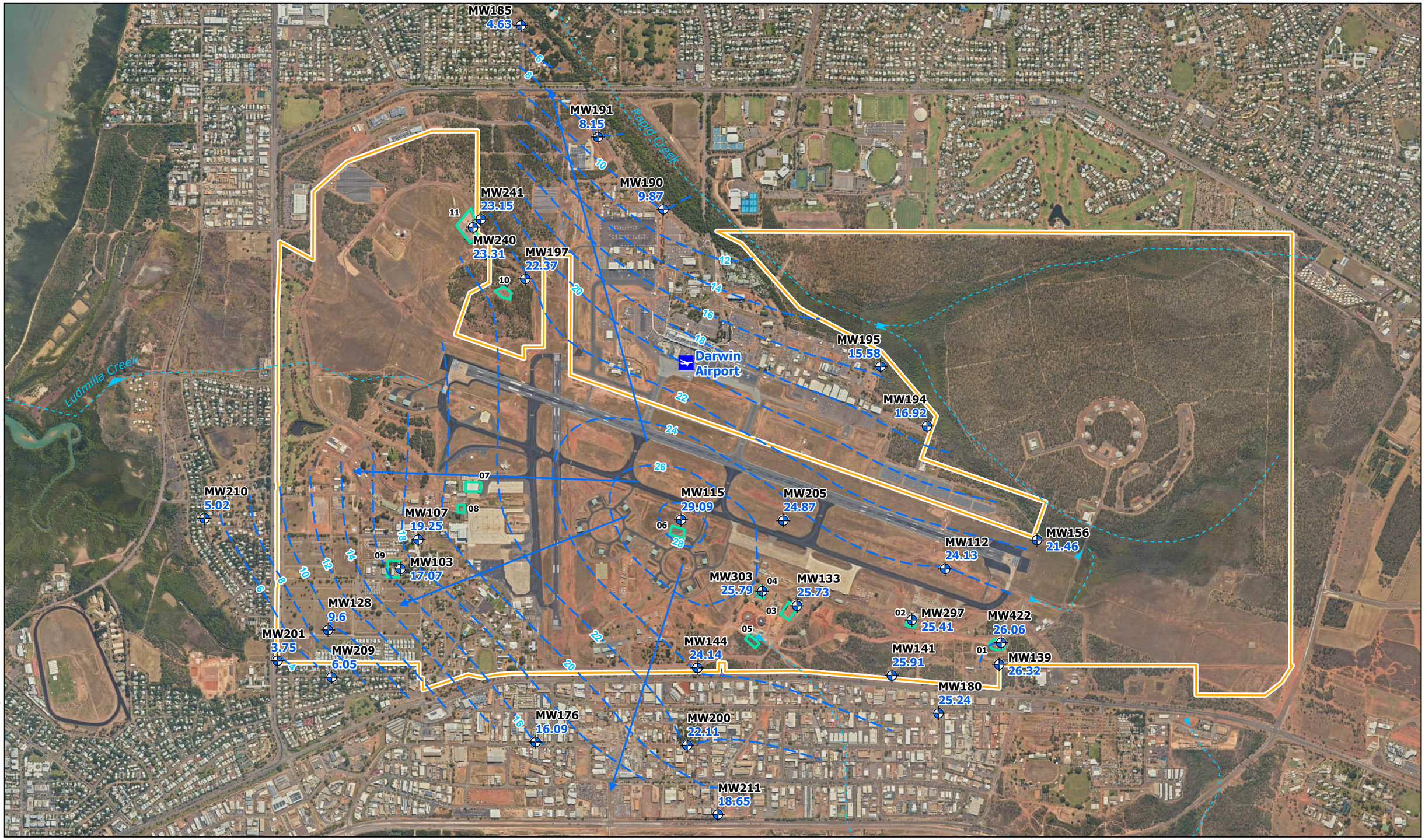

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000

Metres

1:20,000 (when printed at A3)

Legend

- Groundwater Monitoring Location
- Inferred Groundwater Level
- Inferred Groundwater Direction
- Drainage
- RAAF Base Darwin
- Source Area

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
03	Former fuel farm 4
04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Inferred Groundwater Contours
March 2022

PROJECT ID	60612561
CREATED BY	KD
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VERSION:	1

Figure
F2D

A3 size

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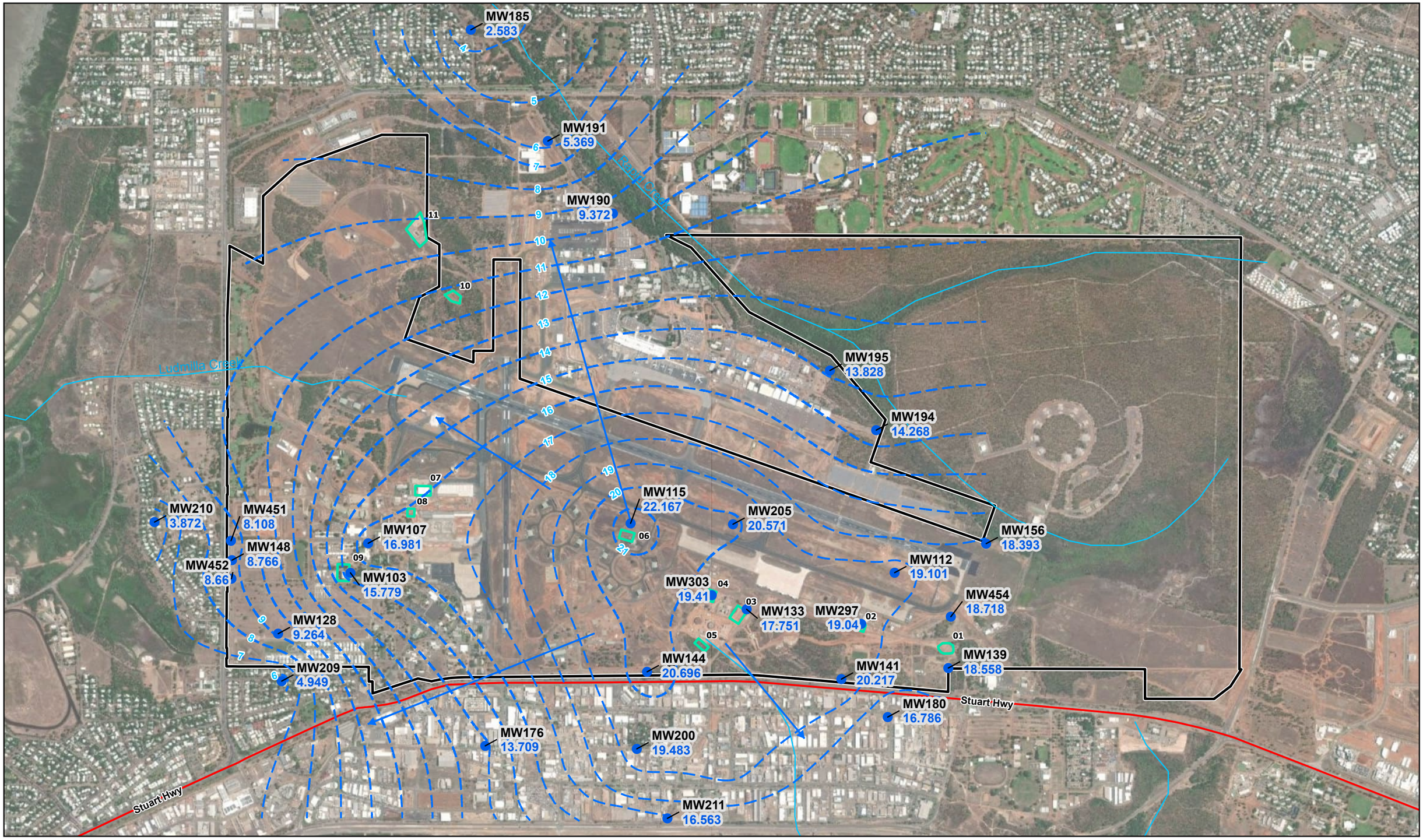

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.2 0.4 0.6 0.8 1
Kilometers

1:20,000 (when printed at A3)

LEGEND

- RAAF Base Darwin
- Source Area
- Highway
- Watercourses
- Bi-annual Monitoring Locations
- Inferred Groundwater Level
- Inferred Groundwater Direction

Note: MW235 was sampled as a contingency location for MW422
Monitoring locations MW112, MW128 and MW133 were not included in contouring.

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
03	Former fuel farm 4
04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Inferred Groundwater Contours
September 2022

PROJECT ID 60612561
CREATED BY JIANJ
LAST MODIFIED JIANJ 14 AUG 2023
VERSION: 1

Figure
F2E

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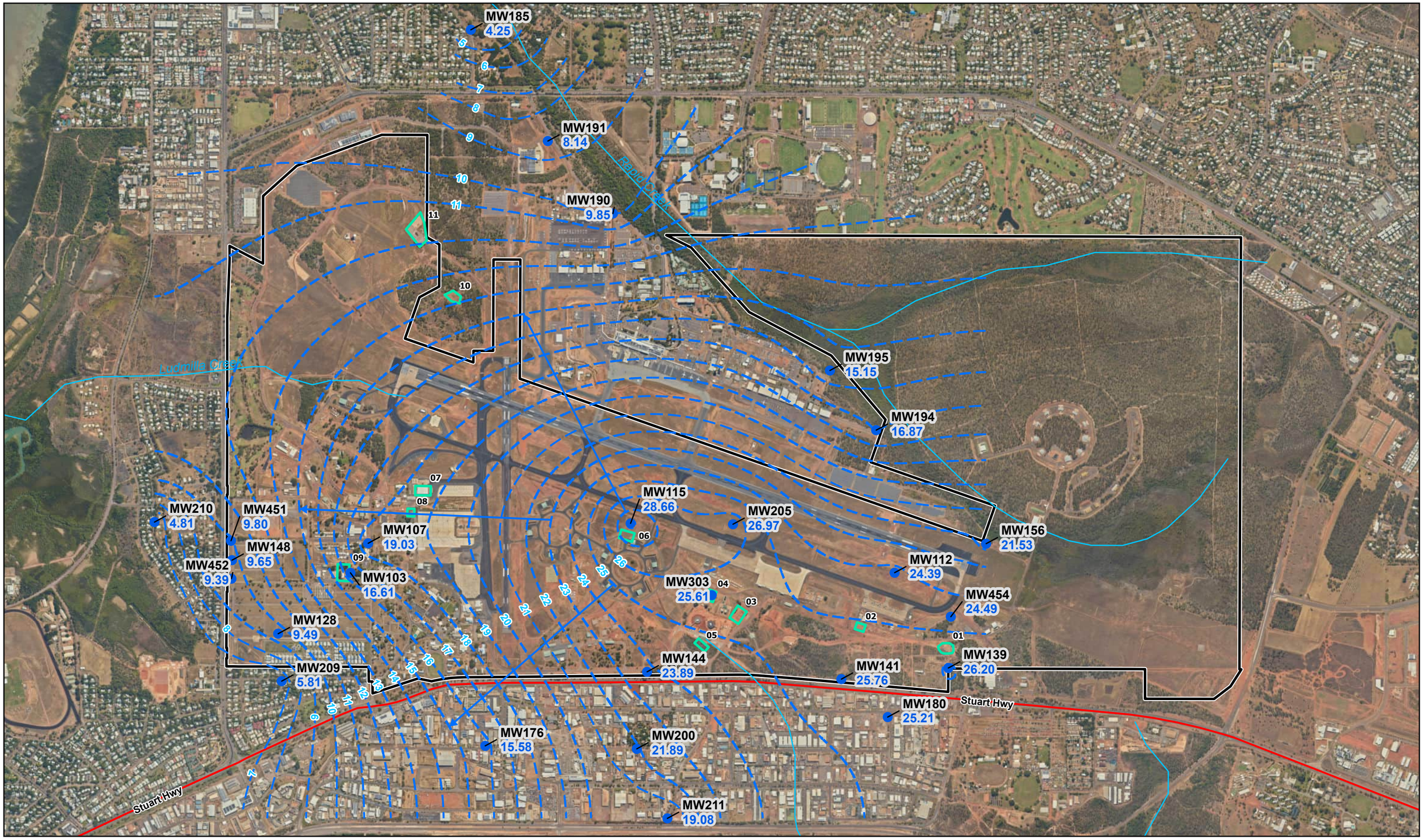

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 200 400 600 800 1,000

Metres

1:20,000 (when printed at A3)

LEGEND

- RAAF Base Darwin
- Source Area
- Highway
- Watercourses
- Bi-annual Monitoring Locations
- Inferred Groundwater Level
- Inferred Groundwater Direction

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
03	Former fuel farm 4
04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report (November 2020 – June 2023)

Inferred Groundwater Contours March 2023

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VERSION:	1

Figure
F2F

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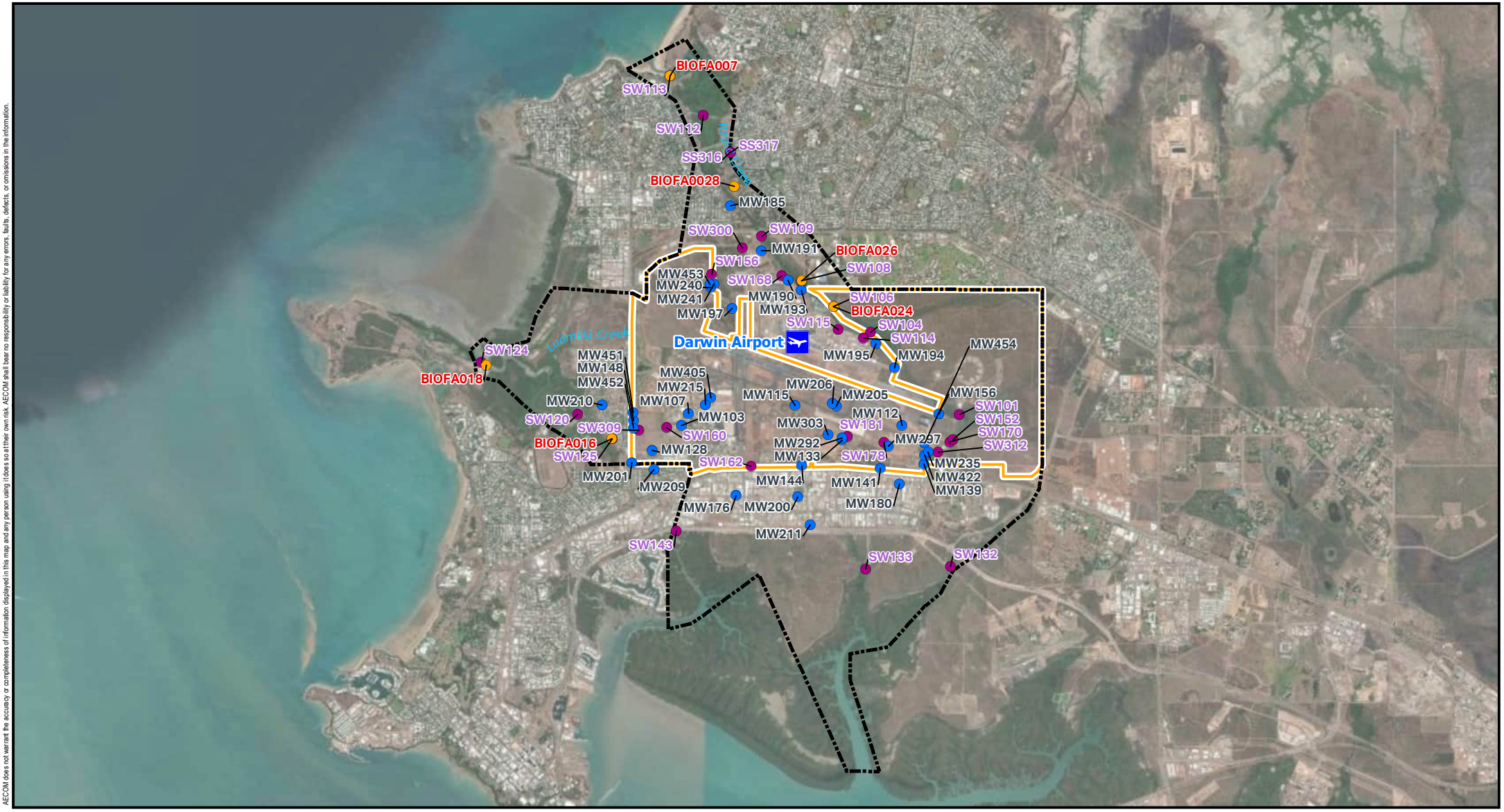

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.5 1 2

Kilometres

1:72,473 (when printed at A4)

LEGEND

- Darwin Airport
- Biota Locations
- Groundwater Monitoring Locations
- Surface Water Locations
- Management Area
- RAAF Base Darwin

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Management Area and Monitoring Locations

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 14 AUG 2023
VERSION:	1

Figure F3

Map Document: \\na.aecomnet.com\lfs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF3_RAAFDarwin_IR23_ManagementAreaMonitoringLocations_A4L_230707.mxd (JianJ)

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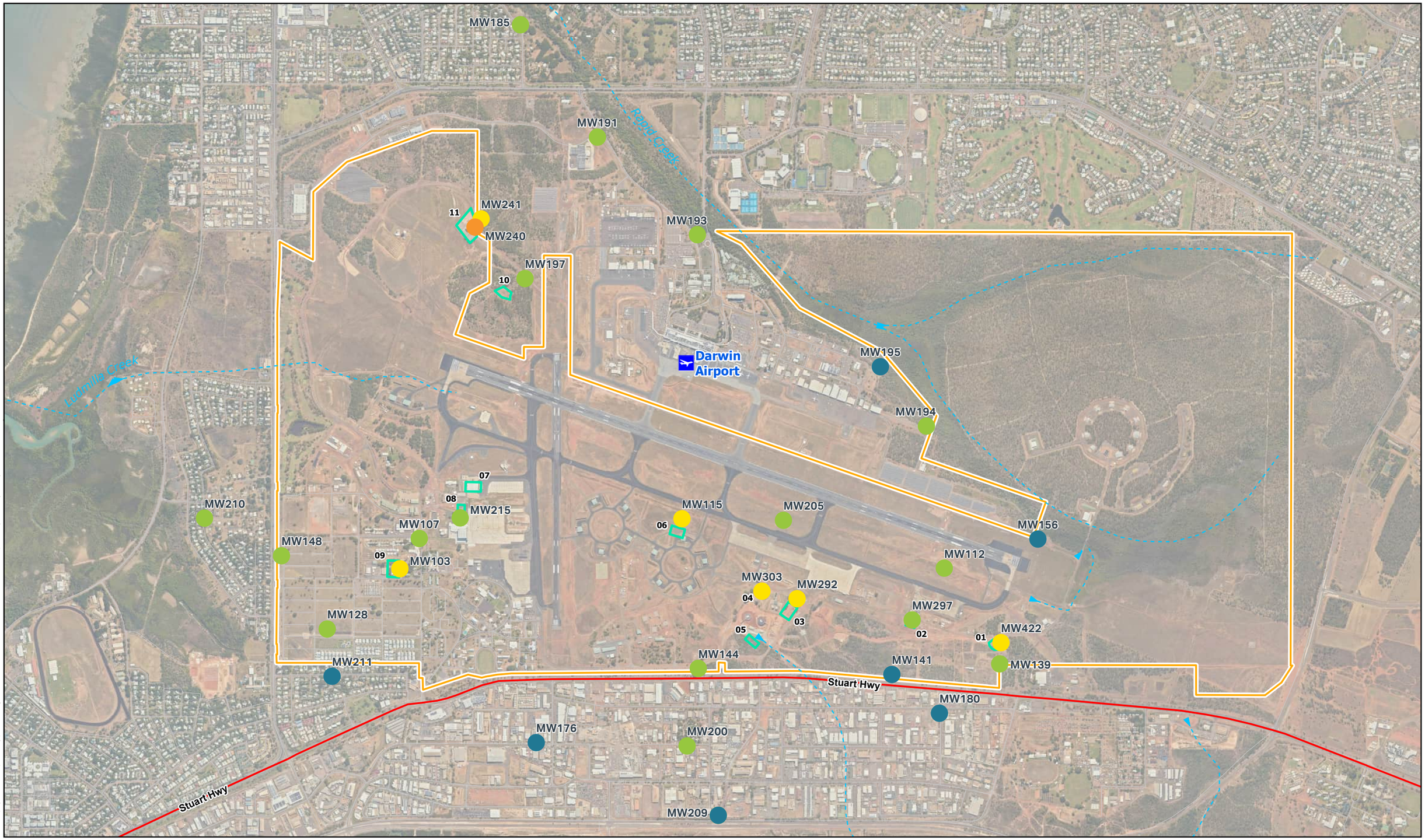

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000

Metres

1:20,000 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

PFOA Concentrations

- Below LOR
- LOR to 0.56 µg/L
- 0.56 to 5.6 µg/L
- 5.6 to 19 µg/L
- > 19 µg/L

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
03	Former fuel farm 4
04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Groundwater Analytical Results - PFOA
End of Dry Season 2020

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure
F4.1A

Filename: \\na.aecomnet.com\lfs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF4_1A_RAAFDarwin_IR23_GWAnalytical_PFOA_NOV20_A3L_230708_2.mxd

A3 size

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000

Metres

1:20,000 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

Sum of PFOS and PFHxS Concentrations

- Below LOR
- LOR to 0.07 µg/L
- 0.07 to 0.7 µg/L
- 0.7 to 7 µg/L
- 7 < 70 µg/L
- => 70 µg/L

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
03	Former fuel farm 4
04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report (November 2020 – June 2023)

Groundwater Analytical Results - PFOS+PFHxS End of Dry Season 2020

PROJECT ID 60612561
CREATED BY KD
LAST MODIFIED JIANJ 24 AUG 2023
VERSION: 1

Figure F4.1B

A3 size

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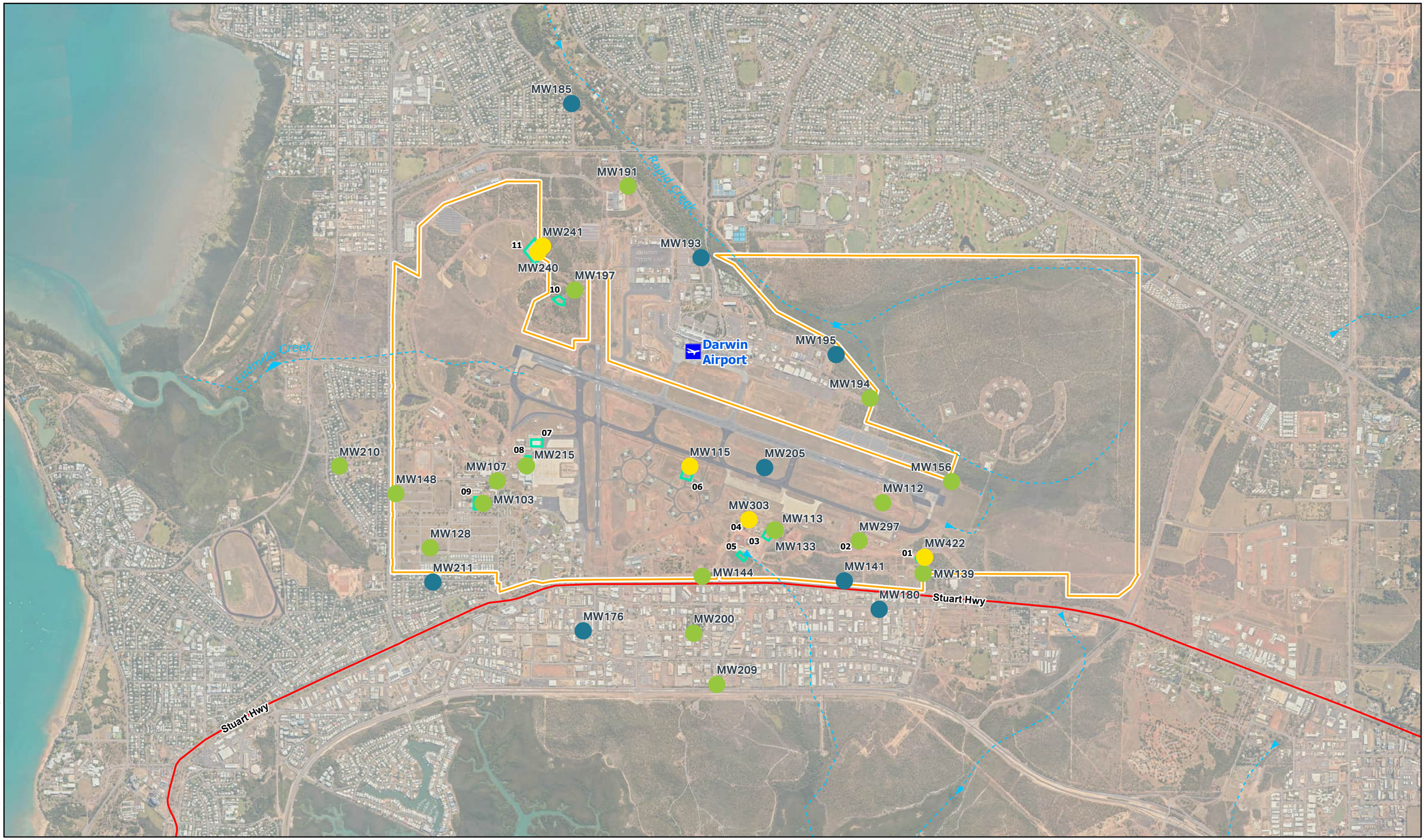

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000

Metres

1:27,223 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

PFOA Concentrations

- Below LOR
- LOR to 0.56 µg/L
- 0.56 to 5.6 µg/L
- 5.6 to 19 µg/L
- > 19 µg/L

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
03	Former fuel farm 4
04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report (November 2020 – June 2023)

Groundwater Analytical Results - PFOA
End of Wet Season 2021

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure

F4.2A

A3 size

Filename: \\na.aecomnet.com\lfs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF4_2A_RAAFDarwin_IR23_GWAnalytical_PFOA_APR21_A3L_230708_2.mxd

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000
Metres

1:20,000 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

Sum of PFOS and PFHxS Concentrations

- Below LOR
- LOR to 0.07 µg/L
- 0.07 to 0.7 µg/L
- 0.7 to 7 µg/L
- 7 < 70 µg/L
- => 70 µg/L

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
03	Former fuel farm 4
04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Groundwater Analytical Results -
PFOS+PFHxS End of Wet Season 2021

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure
F4.2B

Filename: \\na.aecomnet.com\lfs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF4_2B_RAAFDarwin_IR23_GWAnalytical_PFOS+PFHxS_APR21_A3L_230708.mxd

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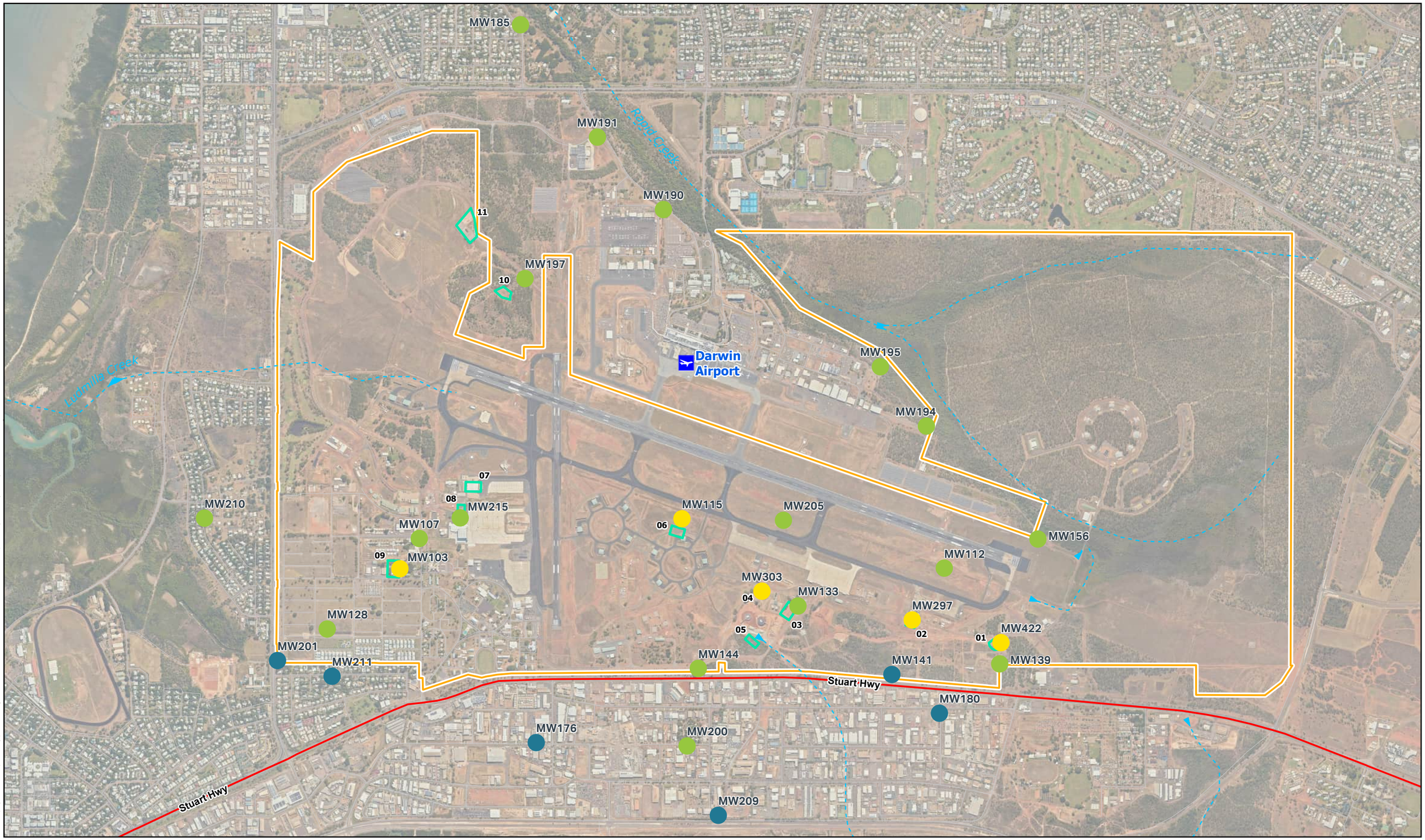

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000

Metres

1:20,000 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

PFOA Concentrations

- Below LOR
- LOR to 0.56 µg/L
- 0.56 to 5.6 µg/L
- 5.6 to 19 µg/L
- > 19 µg/L

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
03	Former fuel farm 4
04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Groundwater Analytical Results - PFOA
End of Dry Season 2021

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure
F4.3A

Filename: \\na.aecomnet.com\lfs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF4_3A_RAAFDarwin_IR23_GWAnalytical_PFOA_NOV21_A3L_230708.mxd

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000
Metres

1:20,000 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

Sum of PFOS and PFHxS Concentrations

- Below LOR
- LOR to 0.07 µg/L
- 0.07 to 0.7 µg/L
- 0.7 to 7 µg/L
- 7 < 70 µg/L
- => 70 µg/L

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
03	Former fuel farm 4
04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Groundwater Analytical Results -
PFOS+PFHxS End of Dry Season 2021

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure
F4.3B

Filename: \\na.aecomnet.com\lfs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF4_3B_RAAFDarwin_IR23_GWAnalytical_PFOS+PFHxS_NOV21_A3L_230708.mxd

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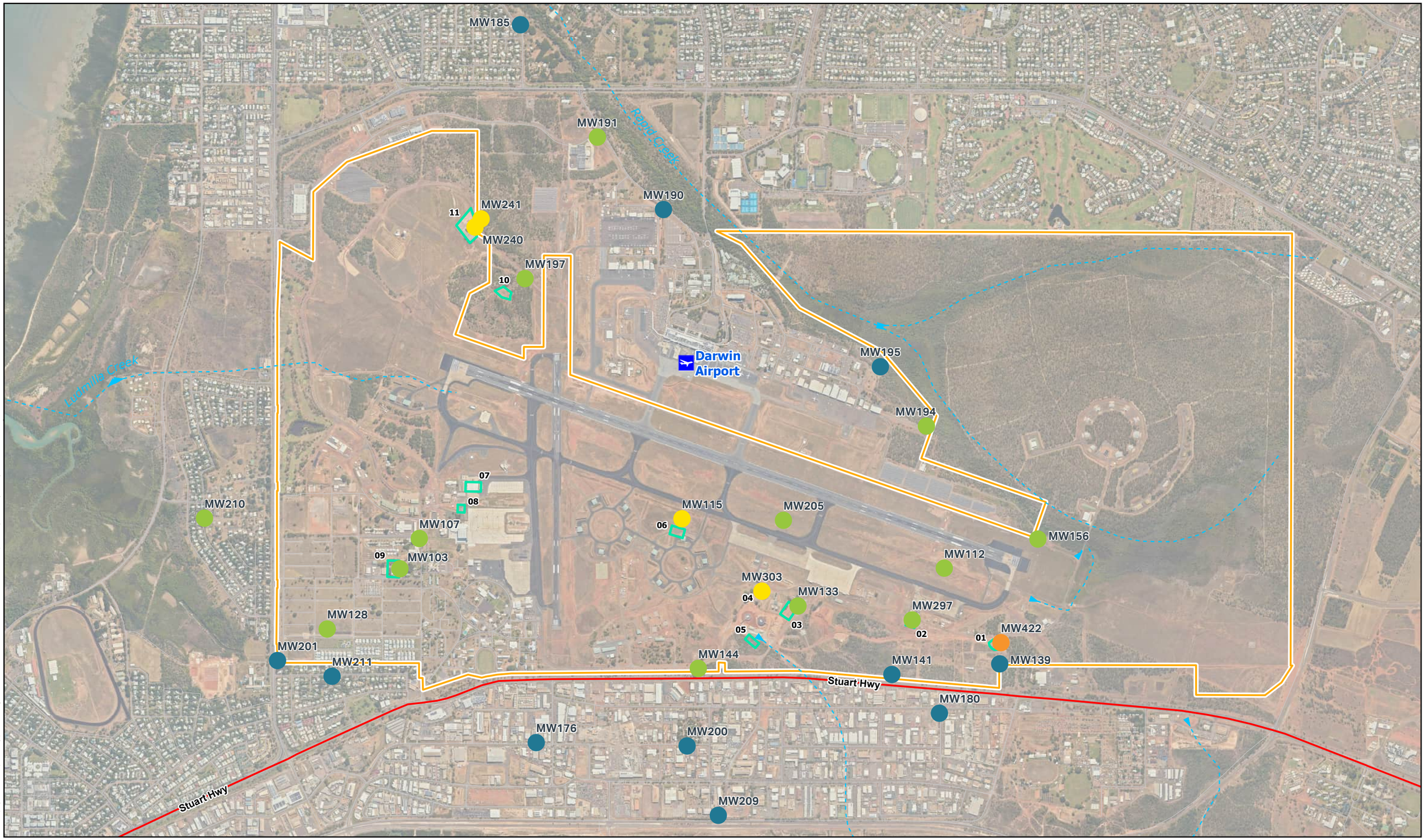

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000
Metres

1:20,000 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

PFOA Concentrations

- Below LOR
- LOR to 0.56 µg/L
- 0.56 to 5.6 µg/L
- 5.6 to 19 µg/L
- > 19 µg/L

Source ID	Area
01	Former fire training area 1
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11	Current fire training area

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Groundwater Analytical Results - PFOA
End of Wet Season 2022

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure
F4.4A

Filename: \\na.aecomnet.com\lfs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF4_4A_RAAFDarwin_IR23_GWAnalytical_PFOA_MAR22_A3L_230708.mxd

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000

Metres

1:20,000 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
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- Road

Sum of PFOS and PFHxS Concentrations

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Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report (November 2020 – June 2023)
Groundwater Analytical Results - PFOS+PFHxS - End of Wet Season 2022

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure

F4.4B

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PFOA Concentrations

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Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Groundwater Analytical Results - PFOA
End of Dry Season 2022

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure
F4.5A

Filename: \\na.aecomnet.com\lfs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF4_5A_RAAFDarwin_IR23_GWAnalytical_PFOA_SEPT22_A3L_230708.mxd

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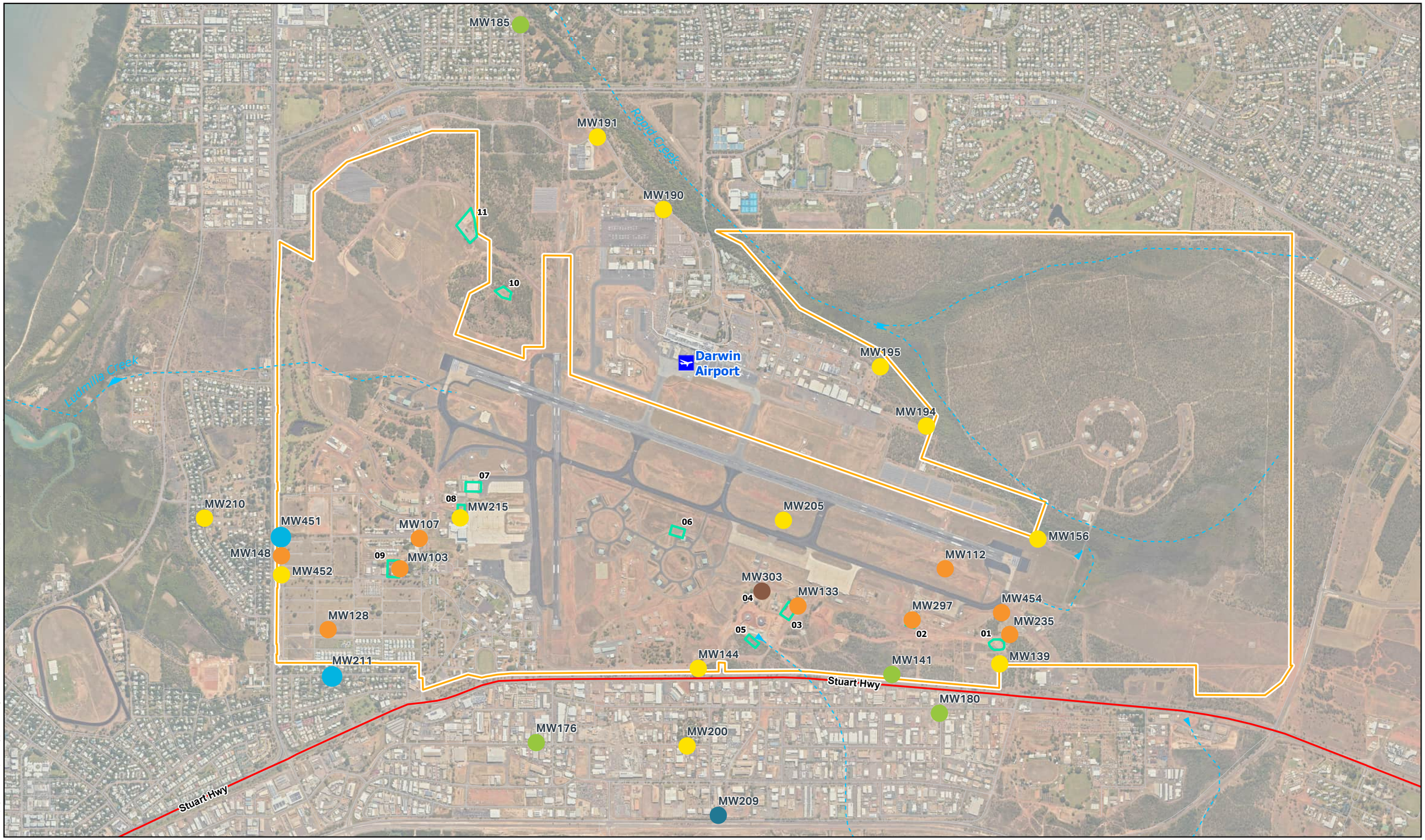

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000

Metres

1:20,000 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

Sum of PFOS and PFHxS Concentrations

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07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

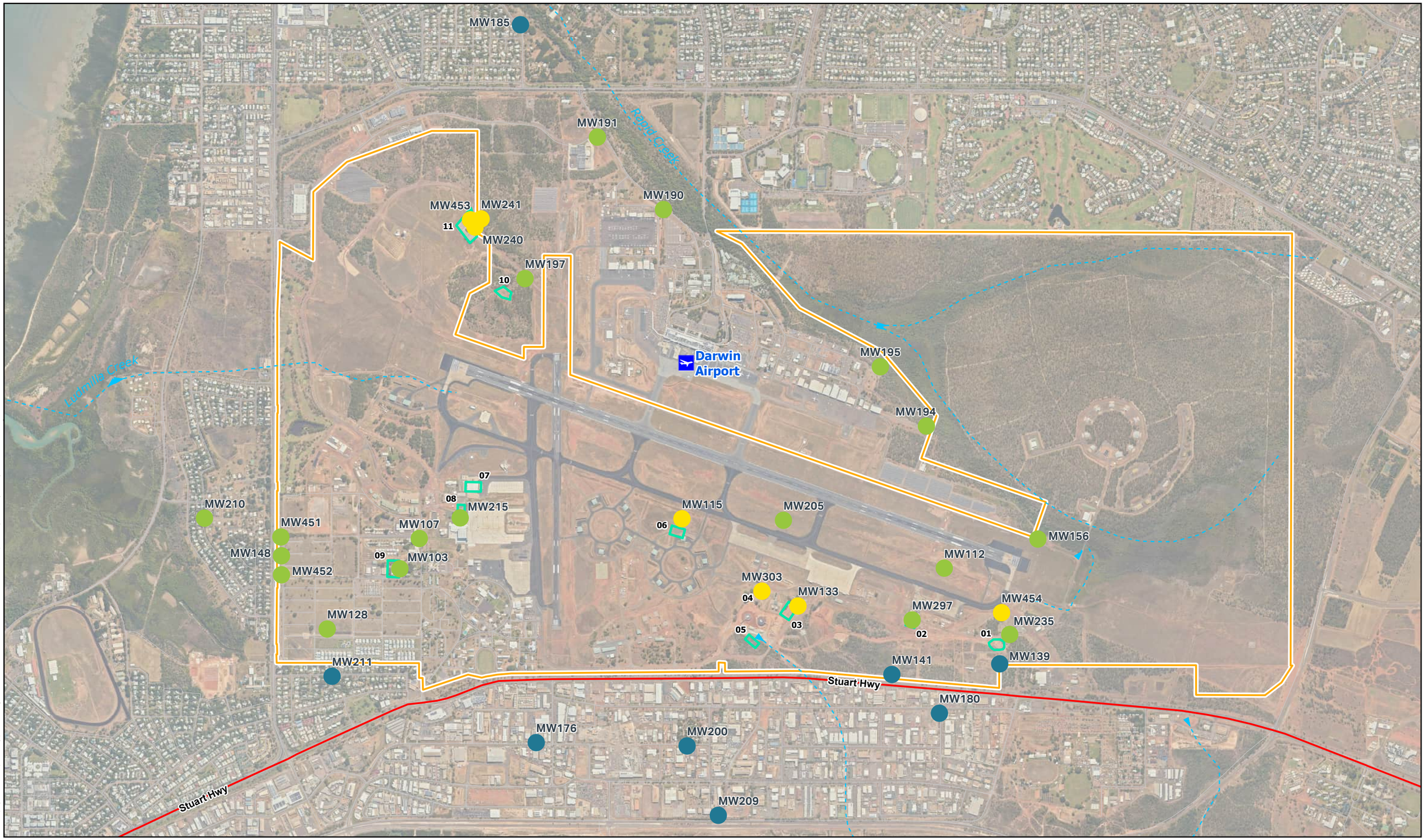
Groundwater Analytical Results - PFOS+PFHxS - End of Dry Season 2022

PROJECT ID 60612561
CREATED BY KD
LAST MODIFIED JIANJ 24 AUG 2023
VERSION: 1

Figure F4.5B

A3 size

Filename: \\na.aecomnet.com\lfs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF4_5B_RAAFDarwin_IR23_GWAnalytical_PFOS+PFHxS_SEPT22_A3L_230708.mxd



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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000
Metres

1:20,000 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

PFOA Concentrations

- Below LOR
- LOR to 0.56 µg/L
- 0.56 to 5.6 µg/L
- 5.6 to 19 µg/L
- > 19 µg/L

Source ID	Area
01	Former fire training area 1
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08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Groundwater Analytical Results - PFOA
End of Wet Season 2023

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure
F4.6A

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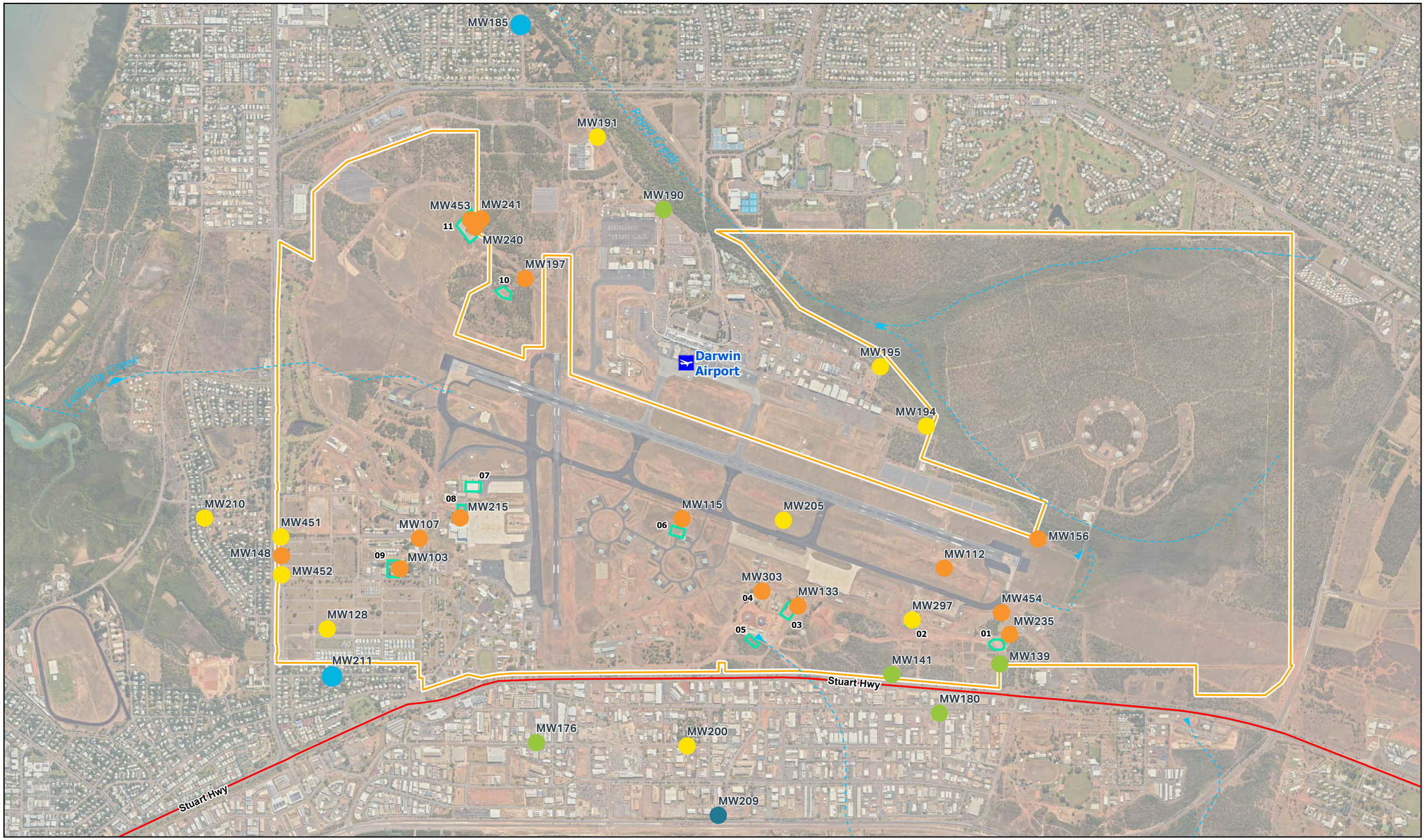

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000

Metres

1:20,000 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

Sum of PFOS and PFHxS Concentrations

- Below LOR
- LOR to 0.07 µg/L
- 0.07 to 0.7 µg/L
- 0.7 to 7 µg/L
- 7 < 70 µg/L
- => 70 µg/L

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
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04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report (November 2020 – June 2023)

Groundwater Analytical Results - PFOS+PFHxS - End of Wet Season 2023

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure F4.6B

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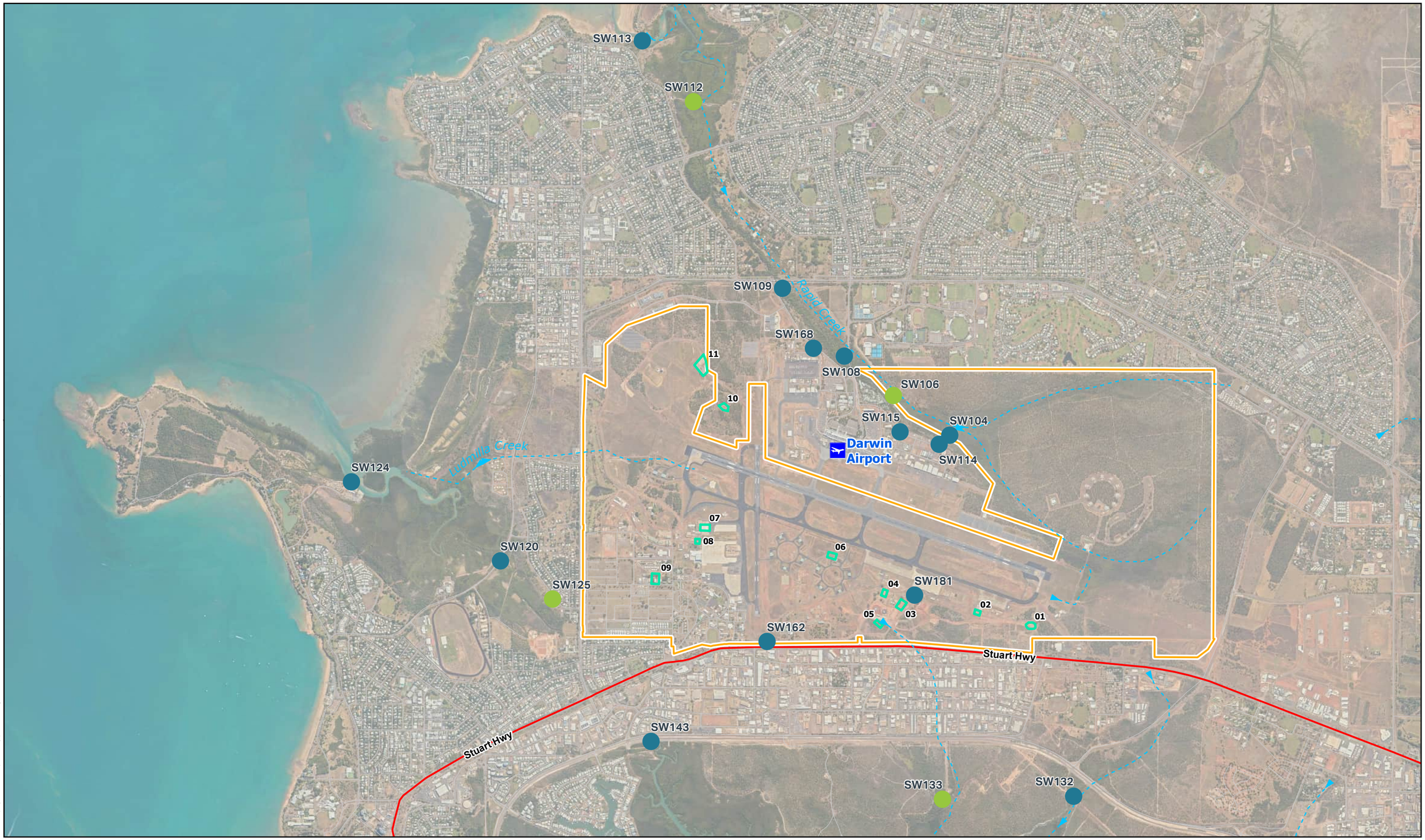
A3 size



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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 400 800 1,600

Metres

1:32,155 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

PFOA Concentrations

- Below LOR
- LOR to 0.56 µg/L
- 0.56 to 5.6 µg/L
- 5.6 to 19 µg/L
- > 19 µg/L

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
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10	Former fire training area 2
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Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Surface Water Analytical Results - PFOA - Start of Wet Season 2020

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure

F5.1A

Filename: \\na.aecomnet.com\fs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF5_1A_RAAFDarwin_IR23_SWAnalytical_PFOA_DEC20_A3L_230708.mxd

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 400 800 1,600

Metres

1:32,155 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

Sum of PFOS+PFHxS Concentrations

- Below LOR
- LOR to 0.07 µg/L
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Source ID	Area
01	Former fire training area 1
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Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report (November 2020 – June 2023)

Surface Water Analytical Results - PFOS+PFHxS - Start of Wet Season 2020

PROJECT ID 60612561
CREATED BY KD
LAST MODIFIED JIANJ 24 AUG 2023
VERSION: 1

Figure F5.1B

Filename: \\na.aecomnet.com\fs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF5_1B_RAAFDarwin_IR23_SWAnalytical_PFOS+PFHxS_DEC20_A3L_230708.mxd

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 400 800 1,600

Metres

1:32,155 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
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PFOA Concentrations

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Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Surface Water Analytical Results - PFOA - End of Wet Season 2021

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure

F5.2A

A3 size

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 400 800 1,600

Metres

1:32,155 (when printed at A3)

Legend

- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

Sum of PFOS+PFHxS Concentrations

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Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report (November 2020 – June 2023)

Surface Water Analytical Results - PFOS+PFHxS - End of Wet Season 2021

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure F5.2B

A3 size

Filename: \\na.aecomnet.com\fs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF5_2B_RAAFDarwin_IR23_SWAnalytical_PFOS+PFHxS_APR21_A3L_230708.mxd

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Data sources:

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Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Surface Water Analytical Results -
PFOA - Start of Wet Season 2022 (Jan)

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure
F5.3A

Filename: \\na.aecomnet.com\fs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF5_3A_RAAFDarwin_IR23_SWAnalytical_PFOA_JAN22_A3L_230708.mxd

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Data sources:

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Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report (November 2020 – June 2023)

Surface Water Analytical Results - PFOS+PFHxS - Start of Wet Season 2022 (Jan)

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure F5.3B

Filename: \\na.aecomnet.com\lfs\APAC\Sydney-AUSYD1\Secure\Groups\GIS\7_Small_Jobs_INTERSTATE_PROJECTS\DWN_60612561\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\07_2023_IR\60612561_FigF5_3B_RAAFDarwin_IR23_SWAnalytical_PFOS+PFHxS_JAN22_A3L_230708.mxd

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Metres

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Legend

- Drainage
- RAAF Base Darwin
- Source Area
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- Road

PFOA Concentrations

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PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report
(November 2020 – June 2023)

Surface Water Analytical Results - PFOA - End of Wet Season 2022

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure

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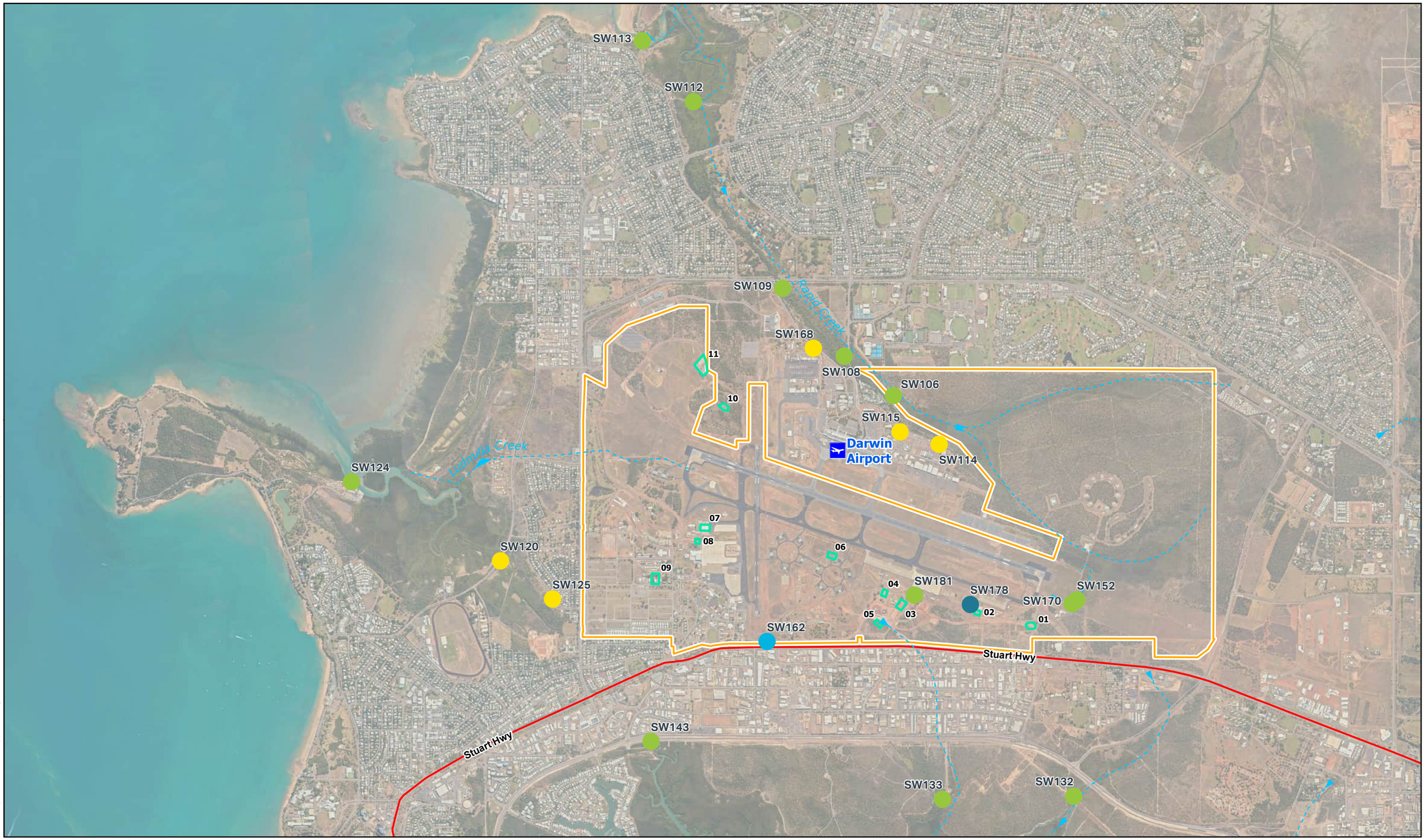

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 400 800 1,600

Meters

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Legend

- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

Sum of PFOS+PFHxS Concentrations

- Below LOR
- LOR to 0.07 µg/L
- 0.07 to 0.7 µg/L
- 0.7 to 7 µg/L
- 7 to 70 µg/L
- => 70 µg/L

Source ID	Area
01	Former fire training area 1
02	Former fuel farm 5
03	Former fuel farm 4
04	Former fuel farm 6
05	AFFF contaminated soil stockpiles
06	Former aviation rescue firefighting fire station
07	Hangar 31
08	Former fuel farm 1
09	Former RAAF fire station
10	Former fire training area 2
11	Current fire training area

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report (November 2020 – June 2023)

Surface Water Analytical Results - PFOS+PFHxS - End of Wet Season 2022

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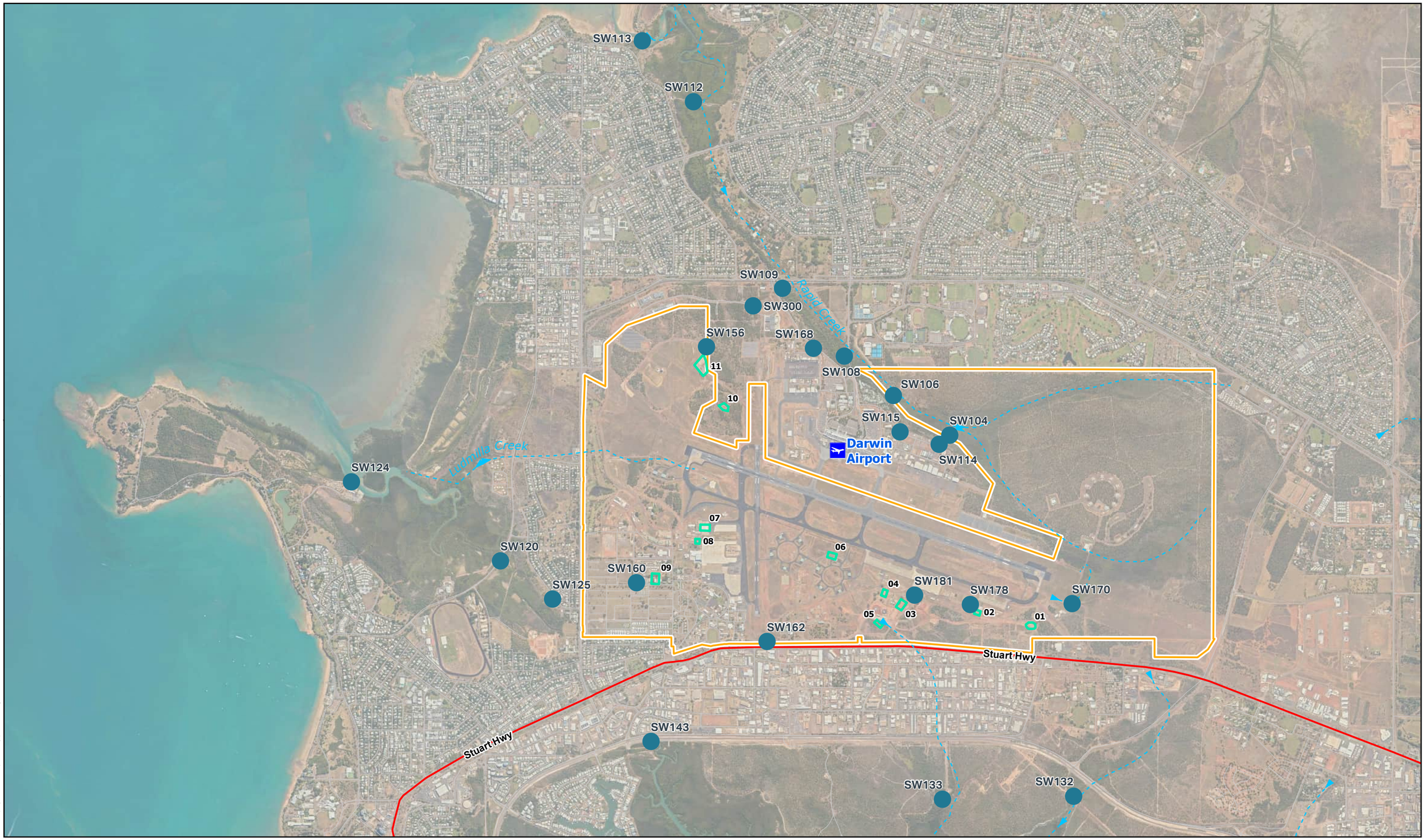

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PFAS OMP RAAF BASE DARWIN
Ongoing Monitoring Interpretive Report (November 2020 – June 2023)

Surface Water Analytical Results - PFOA - Start of Wet Season 2022 (Nov)

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CREATED BY	KD
LAST MODIFIED	JIANJ 24 AUG 2023
VERSION:	1

Figure

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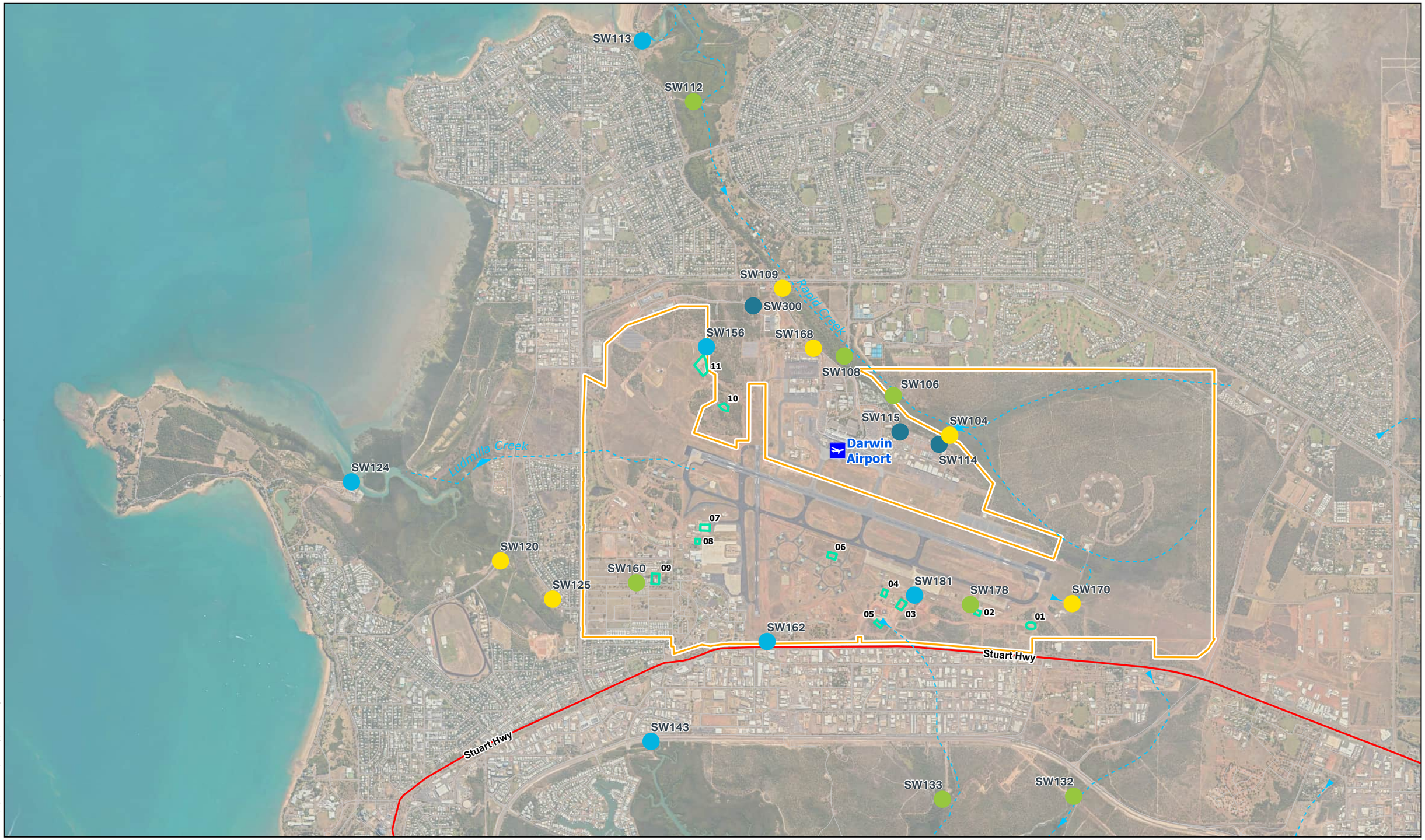

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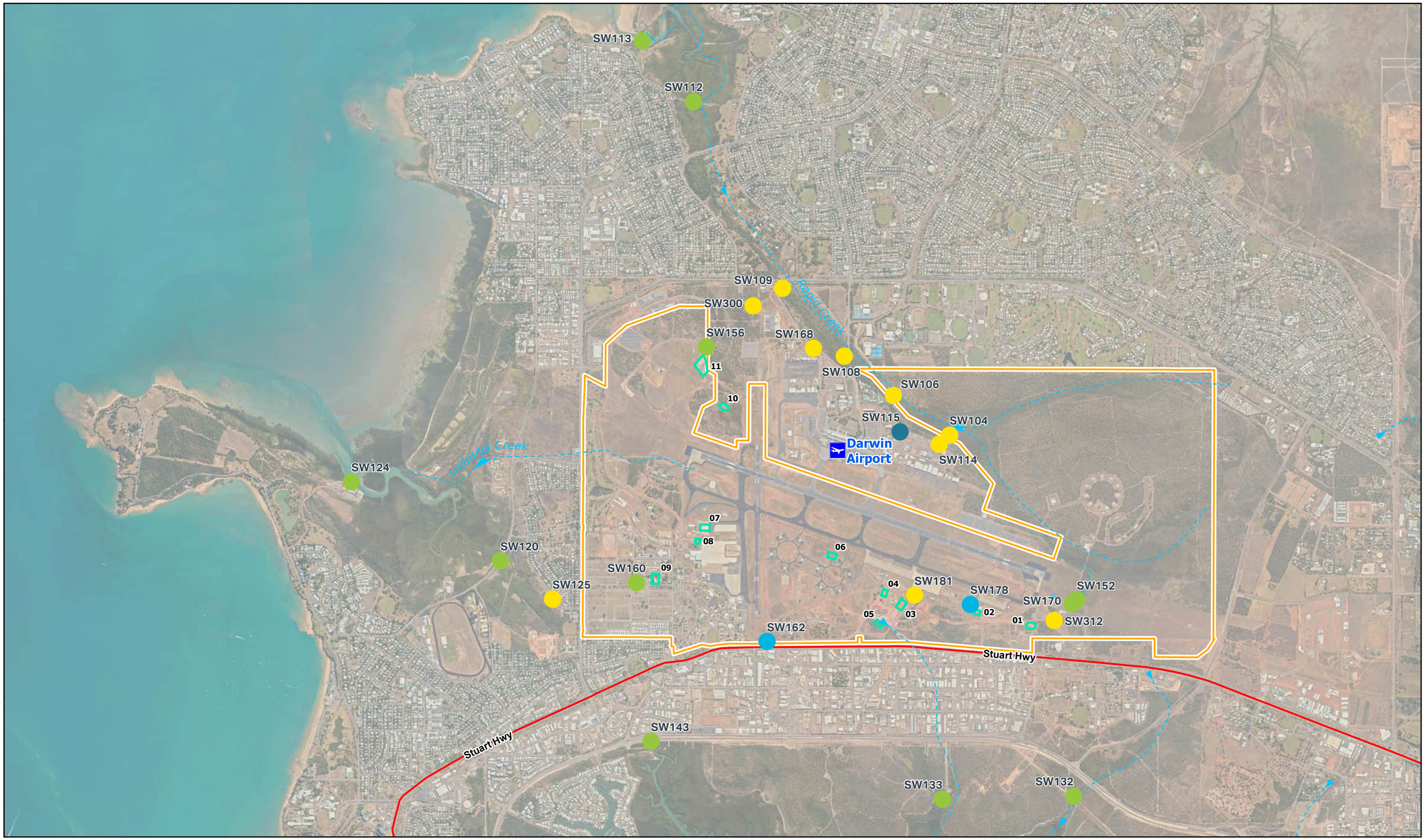

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Appendix B

SAQP and Factual Reports

Prepared for
Department of Defence, Directorate of PFAS Remediation, Environment and Engineering Branch
ABN: 68 706 814 312

AECOM

Sampling Analysis and Quality Plan

RAAF Base Darwin

16-Jan-2023
PFAS OMP - RAAF Darwin
Doc No. 60612561_OMP_RAAF Darwin_SAQP_Rev2_20220217

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Delivering a better world

Sampling Analysis and Quality Plan

RAAF Base Darwin

Client: Department of Defence,
Directorate of PFAS Remediation,
Environment and Engineering Branch

ABN: 68 706 814 312

Prepared by

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16-Jan-2023

Job No.: 60612561

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 and ISO45001.

Quality Information

Document Sampling Analysis and Quality Plan

Ref 60612562_RAAF Darwin_OMP_SAQP_Rev 2_0.docx

Date 16-Jan-2023

Prepared by Azrai Parish-Perandis

Reviewed by David Steele

Revision History

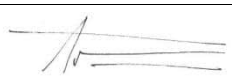
Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
0	5-Dec-2019	Final	Andrew Treasure Senior Environmental Scientist	
1	02-Nov-2021	Revised Final	James Guzman Principal Environmental Scientist	
2	16-Jan-2023	Revised Final	James Guzman Principal Environmental Scientist	

Table of Contents

1.0 Introduction

1.1 Preamble

In July 2019 AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement routine monitoring programs for per- and poly-fluoroalkyl substances (PFAS) over a three-year period at selected Defence sites within the following four Defence regions:

- New South Wales and Jervis Bay Territories (excluding Riverina) Region (NSW & ACT);
- North Queensland Region (North QLD);
- South Queensland Region (South QLD);
- South Australia and Northern Territory Region (SA & NT).

This Sampling Analysis and Quality Plan (SAQP) has been prepared in relation to the proposed Ongoing Monitoring Plan (OMP) (Coffey, 2019a) works at the RAAF Base Darwin (the Site) (**Figure 1, Appendix B**) in the **SA & NT Region**. RAAF Base Darwin is located approximately seven kilometres from the Darwin central business district in the NT.

1.2 SAQP Objectives

The objectives of this SAQP are to:

- Define the proposed scope of works in detail;
- Outline the proposed sampling methodology and procedures to be adopted;
- Outline the proposed quality assurance and quality control (QA/QC) measures to be adopted; and
- Define the data collection and management requirements for the project.

1.3 Scope of Works

To meet the OMP (Coffey, 2019a) objectives, the following scope of works are for a three-year monitoring period (2019 to 2022) as detailed in the Site OMP. The scope of works has been extended an additional two years from 2022 to the end of 2024 and has been updated to address identified data gaps and recommendations from previous sampling rounds. This is reflected in **Table 1** and will be implemented for the remaining duration of the OMP (Coffey, 2019a).

Table 1 Scope of Works- Yearly Monitoring Commitment

Sample Matrix	Number of Sample Locations	Laboratory Analysis	Frequency	Number of Monitoring Events per Year	Approximate Monitoring Period
Groundwater (on- and off-Base bores)	34 monitoring locations	Standard PFAS Laboratory Suite (Department of Defence 2022)	Biannual	2	End-Wet season (March), and end-Dry season (October-December)
Surface water (off-Base)	14 monitoring locations	Standard PFAS Laboratory Suite (Department of Defence 2022)	Twice in Wet Season	2	Start-Wet season (undertaken as soon as practicable after a first flush rain event), nominally December/January,

Sample Matrix	Number of Sample Locations	Laboratory Analysis	Frequency	Number of Monitoring Events per Year	Approximate Monitoring Period
					and end-Wet season (March).
Surface water (off-Base)	1 monitoring location	Standard PFAS Laboratory Suite (Department of Defence 2022)	Monthly throughout Wet season	5	Monthly December – April.
Surface water (off-Base)	1 monitoring location	Standard PFAS Laboratory Suite (Department of Defence 2022)	Monthly throughout Wet season and twice during the dry season	7	Monthly December – April, and June and August.
Surface water (on-Base)	2 monitoring location	Standard PFAS Laboratory Suite (Department of Defence 2022)	Monthly throughout Wet season	5	Monthly December – April.
Surface water (on-Base)	7 monitoring locations	Standard PFAS Laboratory Suite (Department of Defence 2022)	Twice in Wet Season	2	Start-Wet season (undertaken as soon as practicable after a first flush rain event), following a greater than 100mm rain event, nominally December/January), and end-Wet season (March)
Aquatic biota (off-Base)	6 monitoring locations	Standard PFAS Laboratory Suite (Department of Defence 2022)	Annually	3	End-Dry season or start-Wet season (October –December)

2.0 Site Identification

2.1 Site Details

RAAF Base Darwin is located on the Stuart Highway approximately seven kilometres from the Darwin central business district, adjacent to the suburbs of Winnellie, Ludmilla, Coconut Grove, Millner, Jingili, Moil, Anula, Malak, Karama, and the North Lakes Estate.

The Base encompasses an area of 1,278 hectares bounded by McMillans Road and the Northlakes Estate/Marrara Sports Complex to the north, Amy Johnson Avenue to the east, Stuart Highway to the south and Bagot Road to the west. Darwin International Airport (DIA) occupies an area within the northwest of the Base.

The Base is an operational joint civil-military airfield. The Base has administrative, accommodation, recreational and operational support facilities as well as technical workshops, aircraft hardstands and aircraft pavements. In addition to civil aircraft operations, the airfield supports both Australian and international military aircraft operations. Aircraft movement areas (runways and taxiways) are utilised by both civilian air operations and Defence.

The Management Area includes selected areas of RAAF Base Darwin, selected portions of the surface water bodies of Rapid Creek, Ludmilla Creek, Reichardt Creek, and Sadgroves Creek and groundwater containing PFAS in the suburb of Ludmilla, Rapid Creek, and Winnellie.

2.2 Conceptual Site Model

The Conceptual Site Model (CSM) is presented in the Human Health Risk assessment (HHRA) report (Coffey 2018a) and the Supplementary Detailed Site Investigation (DSI) (Coffey, 2018c) which summarises the linkages between sources, exposure pathways and receptors and PFAS extents.

3.0 Data Quality Assessment

3.1 Data Quality Objectives

The amended National Environmental Protection Measure (NEPM, Schedule B [2]) Guideline on Site Characterisation (2013) specifies that the nature and quality of the data produced in an investigation will be determined by the Data Quality Objectives (DQOs). As referenced by the NEPM, the DQO process is detailed in the United States Environmental Protection Agency (US EPA) *Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA QA/G-4: EPA/240/B-06/001), February 2006.*

The US EPA defines the process as *'a strategic planning approach based on the Scientific Method that is used to prepare for a data collection activity. It provides a systematic procedure for defining the criteria that a data collection design should satisfy, including when to collect samples, where to collect samples, the tolerable level of decision errors for the study, and how many samples to collect'.*

The process of establishing appropriate DQOs is defined according to the following seven steps (**Table 2**):

Table 2 The seven steps in defining DQOs

Step	Data Quality Objective Step
1	***State the problem*** – Define the problem that necessitates the study; identify the planning team, examine budget, schedule.
2	***Identify the goal of the study*** – State how environmental data will be used in meeting objectives and solving the problem, identify study questions, define alternative outcomes.
3	***Identify information inputs*** – Identify data and information needed to answer study questions.
4	***Define the boundaries of the study*** – Specify the target population and characteristics of interest, define spatial and temporal limits, scale of inference.
5	***Develop the analytic approach*** – Define the parameter of interest, specify the type of inference, and develop the logic for drawing conclusions from findings.
6	***Specify performance or acceptance criteria*** – Develop performance criteria for new data being collected or acceptable criteria for existing data being considered for use.
7	***Develop the plan for obtaining data*** – Select the resource-effective sampling and analysis plan that meets the performance criteria.

The approach adopted relative to the seven steps presented above is discussed below.

3.1.1 Step 1 – State the Problem

PFAS contamination at the Site has led to the contamination of soil, groundwater, and surface water. PFAS has been measured within biota from surrounding surface water bodies. Advice has been provided to NT agencies regarding the consumption of biota in some water bodies surrounding the Base, as well as various advice regarding management of maintenance activities on the Base. Monitoring of the concentrations of PFAS in the environment is required to ensure that health advice provided to the NT agencies is relevant and appropriate and risks to human health and environmental receptors are managed.

3.1.2 Step 2 – Identify the Goal of the Study

The overall goal of the study is to establish a systematic routine groundwater, surface water and biota sampling and analysis program to provide current and ongoing information on the distribution and concentrations of PFAS in the Management Area.

Specific goals of the program are to:

- understand the changes and trends in the nature, extent, and magnitude of PFAS concentrations in the groundwater, surface water and biota within the Management Area
- understand if the nature, extent, and magnitude of PFAS concentrations has changed significantly to warrant a revision to the human health and environmental risk assessments
- understand if the nature, extent, and magnitude of PFAS concentrations have changed significantly to warrant refinement of any existing management measures.

3.1.3 Step 3 – Identify Information Inputs

To allow assessment of the data against the study goal listed in Step 2 above, the following inputs will be considered:

- PFAS results from previous environmental investigations
- meteorological data including rainfall
- groundwater, surface water and biota sample data collected and analysed for PFAS
- groundwater elevation data
- surface water conditions at time of sampling of surface water and biota
- statistical analysis to identify trends
- advances in laboratory analytical approaches and changes in regulatory requirements

3.1.4 Step 4 – Define the Boundaries of the Study

The spatial and temporal boundaries that apply for data collection are detailed below and will influence the decision-making process for ongoing monitoring:

- The spatial boundary for data collection and decision making is limited to the Management Area shown in Figure 1.
- The sampling completed as part of the OMP (Coffey, 2019a) will be limited to groundwater, surface water and biota at the frequencies defined in Section 4.0.
- The monitoring has occurred over an initial period of three years with the inclusion of an additional two-year extension through July 2024, the need for ongoing monitoring thereafter will be considered

3.1.5 Step 5 – Develop the Analytical Approach

The decision rules can be defined as:

- Analytical selection; all samples will be analysed for the extended PFAS suite (Department of Defence 2022).
- Analytical method selection for PFAS is based on achieving appropriate laboratory Limit of Reporting (LOR) in the various media to be analysed.
- Sample locations have been selected with the objective of monitoring PFAS trends (temporal and seasonal), providing early warning of changes in the migration of PFAS in surface water and groundwater.
- If the laboratory quality assurance/quality control data are within the acceptable ranges, the data will be considered suitable for use.
- If PFAS concentrations are reported above the laboratory LOR, where it was previously <LOR, then it will be considered whether further assessment of the data will be required.

- If the PFAS concentrations in groundwater, surface water and biota sampling locations show an increasing trend over two years of monitoring or increase by >30% in one year, then Defence shall be notified of the results, a review of the OMP (Coffey, 2019a) shall be considered, and the need for further assessment shall be considered.

The decision on the acceptance of the analytical data should be made on the basis of the Data Quality Indicators (DQIs) as follows:

- **Precision:** A quantitative measure of the variability (or reproducibility) of data.
- **Accuracy**: A quantitative measure of the closeness of reported data to the “true” value.
- **Representativeness**: The confidence (expressed qualitatively) that data are representative of each media present on Site.
- **Completeness**: A measure of the amount of useable data from a data collection activity.
- **Comparability**: The confidence (expressed qualitatively) that data may be considered to be equivalent for each sampling and analytical event.

3.1.6 Step 6 – Specify Performance or Acceptance Criteria

Specific limits for the works included in the OMP (Coffey, 2019a) are in accordance with the appropriate guidance made or endorsed by state and national regulations, appropriate indicators of data quality, and standard procedures for field sampling and handling.

This step also examines the certainty of conclusive statements based on the available new data collected. This should include the following points to quantify tolerable limits:

- A decision can be made based on a certainty assumption of 95% confidence in any given data set. A limit on the decision error will be 5% that a conclusive statement may be a false positive or false negative.
- A decision error in the context of the decision rule presented above would lead to either underestimation or overestimation of the risk level associated with a particular sampling area.
- Sampling errors may occur when the sampling program does not adequately detect the variability of a contaminant from point to point across the site. To address this, alternate locations may be sampled, or additional sampling events may be conducted. There may be limitations in the data if aspects of the OMP (Coffey, 2019a) cannot be implemented, such as:
  - Surface water or groundwater sample locations may be dry at the time of sampling.
  - Groundwater sampling locations are damaged or destroyed and therefore cannot be sampled.
  - Access to some sampling locations could be being restricted due to operational activities or inaccessible due to weather.
- Measurement errors can occur during sample collection, handling, preparation, analysis, and data reduction. To address this the following measures are proposed:
  - Collection of sufficient sample mass to facilitate analysis reported to standard laboratory detections limits. Collection of insufficient sample mass may result in raised detection limits.
  - Field staff to follow a standard procedure when collecting samples, including decontamination of tools, and use of appropriate sample containers and preservation methods.
  - Laboratories to follow a standard procedure when preparing samples for analysis and undertaking analysis.
  - Laboratories to report quality assurance/quality control data for comparison with the DQIs established for the SAQP.

3.1.7 Step 7 – Optimise the Design for Obtaining Data

The methodology presented in this SAQP is designed to meet the Project objectives and to achieve the nominated DQOs. Optimisation of the data collection process will be achieved by:

- Working closely with the analytical laboratories and sampling equipment suppliers to ensure that appropriate procedures and processes are developed and implemented prior to and during the fieldwork, to ensure that sample handling, and transport to and processing by the analytical laboratories is appropriate.
- Conducting sampling according to Defence and Australian Standards for the type of sampling being conducted (i.e. groundwater monitoring well sampling versus landholder bore water sampling). These standards are as follows:
    - Department of Defence (July 2018, Amended August 2019), *Contamination Management Manual*
    - Standards Australia (AS/NZS5667.11–1998) Water Quality – Sampling, part 11: *Guidance on sampling of groundwater*.
    - Standards Australia (AS 4482.1-2005) *Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds*.
    - Standards Australia (AS 4482.2-1999) *Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile Substances*.
    - HEPA (2020) PFAS National Environmental Management Plan (NEMP) 2.0
- Conducting sampling in accordance with AECOM's internal PFAS Sample Collection Guidance.
- Sampling conducted by suitably qualified and experienced field staff.
- Basing the sampling upon a CSM developed using the information available at the implementation of the SAQP. Updating the CSM as new data becomes available in the course of the implementation of the SAQP, as required.
- Progressive review of the data throughout the initial three-year OMP (Coffey, 2019a) period plus additional two-year extension and modification of sampling programs to optimise the value of data generated.

If the objectives of the SAQP are not being met, the sampling design and approach will be reviewed and amended, as required.

3.2 Assessment of Data Quality

The quality of data collected as part of the sampling will be assessed on a range of factors including:

- Documentation and data completeness; and
- Data quality – comparability, representativeness, precision, and accuracy of the analytical data.

The project target for data completeness is to achieve 95% of data as suitable for use.

The acceptance criteria for DQIs for samples are specified in **Table 3**

Table 3 Acceptance Criteria for Data Quality Indicators for Sample Analysis

Data Quality Indicators	Acceptance Criteria
Water and Biota Samples	
Rinsate Blanks (where sampling equipment is reused)	Less than the laboratory LOR.
Field Blanks	Less than the laboratory LOR.
Field duplicates/Inter-lab duplicates	The RPDs will be assessed as acceptable if less than or equal to 30% as per the NEPM Schedule B3. Where the results show greater than 30% difference a review of the cause will be conducted (NEPM, 2013). It is noted that RPDs that exceed this range may be considered acceptable where: • Results are less than 10 times the LOR (no limit); • Results are less than 20 times the LOR and the RPD is less than 50%; and • Heterogeneous materials are encountered.
Laboratory duplicates	RPDs less than: • 20% for high level laboratory duplicates (i.e. >20 x LOR); and • 50% for medium level laboratory duplicates (i.e. 10 to 20 x LOR).
Matrix spikes	Recoveries between 70-130% of the theoretical recovery or as nominated in the laboratory's QC report, based on their historical database.
Method blanks	Less than the laboratory LOR.
Laboratory control samples	Recoveries between laboratories specified range for each analyte / analytical suite (Department of Defence 2022).

4.0 Sampling Location Rationale and Methodology

The OMP (Coffey, 2019a) is presented as **Appendix F** of the RAAF Base Darwin PMAP (Defence, 2019) and identifies the specific inputs required to meet Defence's long-term strategic goals in relation to the management of PFAS contamination at the Site.

The OMP (Coffey, 2019a) presents an overview of specific monitoring works to be undertaken and provides the basis for the preparation of this SAQP. This scope of works presented in this SAQP is consistent with that detailed in the OMP (Coffey, 2019a), with the exception of those points of deviation presented in Section 4.19.

4.1 Proposed Schedule

The key elements of the OMP (Coffey, 2019a) are bi-annual monitoring of groundwater and off-base surface water locations, twice yearly (Wet season only) of on-base surface water locations and annual monitoring of biota within Rapid and Ludmilla Creeks. Selected surface water locations will undergo monthly sampling during the wet season, and one of these will undergo mid dry season sampling in both June and August. Bi-annual events are to occur at the end of wet season and end of dry season when groundwater and surface water conditions reflect seasonal influences. On-Base locations have been nominated for wet-season sampling only to assess concentrations and flow rates in drains that capture run-off from PFAS source areas or where significant discharge of water has been observed. The annual biota sampling is to occur at the end of the Dry season prior to substantial commencement of the Wet season, when concentrations are expected to be highest.

Sample events should be conducted in the following periods:

- Q4/Q1 – start of wet season, December/January- Monthly surface water sampling during wet season, December/January/February/March/April
- Q2 – end of wet season, March/April
- Q3 – Mid dry season sampling, June/August
- Q4 – end of dry season, October/November

A program schedule is presented in **Appendix A**.

4.2 Access requirements for sampling on RAAF Base Darwin

4.2.1 Access requirements for sampling on-Base

A range of access requirements exist to gain access to the appropriate areas for the collection of groundwater and surface water samples. Initiating contact with RAAF Base Darwin no less than two weeks prior to sampling is necessary to ensure all access requirements are satisfied and approved by Base Management.

To gain access to RAAF Base Darwin each field team member must obtain baseline clearance from Defence and receive a Defence Common Access Card (DCAC), which allows unescorted entry to the base. Field team members without baseline clearance and DCAC's will need to be escorted by a field team member that has escort authority associated with their DCAC or have arranged an escort prior to sampling.

To conduct works on the base, Estate and Infrastructure Group (E&IG) the contracted Base Manager E&IG, must be contacted to inform them of the intended works and to gain permission prior to carrying those out. As well as grant permission to conduct works, E&IG will alert the dedicated field team of any conflicting works on base. Photo permits must be obtained from E&IG upon arrival at the base, no photos are to be taken before this is done.

If sample locations occur in a construction site, the field team will need to get permission from the project manager to access the site. Any internal inductions for the site will also need to be completed by the team upon the project manager's request.

2 Security Forces Squadron RAAF (2SECFOR) is the base security service and will need to be made aware of the works to be carried out and the locations that sampling will occur in.

To gain access to the airside locations a Work Safety Officer (WSO) will need to be contacted and present for the duration of airside activities. Field team members entering airside locations will need to ensure they complete airside awareness training. This can be organised by enquiring with E&IG.

For sampling locations in the ordnance area, Defence contractor Thales, will need to be contacted to arrange entry, and 2SECFOR alerted to the fact that the team has intention to enter the area.

4.3 Groundwater Sample Location Rationale

There are 34 monitoring wells identified for ongoing monitoring, including on-Base and off-Base locations (comprising of public land access). The OMP (Coffey, 2019a) will monitor groundwater source area concentration changes and changes that may occur at the Base boundary or off-Base locations, which could indicate a change in contaminant transport off-Base.

Table 4 Groundwater Sample Rationale

Area	Rationale
On-Base	• Monitor spatial and temporal variations in PFAS concentrations in groundwater up, down and cross-gradient of source areas • Assess if groundwater PFAS concentrations within and downgradient of the source areas change in response to management measures over time • Provide data to estimate mass of PFAS entering Rapid Creek in the future and monitor changes.
Off-Base - North	• Monitor the spatial and temporal variation in the northern extents of the plume boundary • Provide data to estimate mass of PFAS entering Rapid Creek in the future and monitor changes.
Off-Base – South	• Monitor the spatial and temporal variation in the southern extents of the plume boundary. • Provide data to estimate mass of PFAS entering Sadgroves and Reichardt Creeks in the future and monitor changes.
Off-Base – West and Southwest	• Monitor the spatial and temporal variation in the western and south-western extents of the plume boundary. • Provide data to estimate mass of PFAS entering Ludmilla Creek in the future and monitor changes.

4.4 Groundwater Sampling Locations

The groundwater sample locations to be monitored are presented in Table 5 below, on **Figure 2** in **Appendix B** and **Table 1**, **Appendix C**.

Table 5 Groundwater Monitoring Locations

Area	Description	Sampling Location Code	Sampling Frequency	Number of wells/bores
On-Base	Former Fuel Farm 1 and Hanger 31	MW215	Bi-annual (End-Wet season, and end-Dry season)	**On-Base** (22 locations)
	Former Fuel Farm 5	MW297, MW112		
	Former Fuel Farms 4 & 6	MW303, MW133, MW205		
	Former Fire Training Area 1	MW422, MW139		

Area	Description	Sampling Location Code	Sampling Frequency	Number of wells/bores
	Current Fire Training Area	MW240, MW241		
	RAAF Fire Station	MW103		
	Former ARFF Fire Station	MW115		
	Source area downgradient transect	MW107, MW128		
	Southern boundary of site	MW141, MW144		
	Western boundary of site	MW148		
	Rapid Creek - Eastern end	MW156		
	Western Boundary	MW451 and MW452		
	Current Fire Training Area (CFTA)	MW453		
	Centreline of plume from Former Fire Training Area 1 (FFTA1)	MW454		
Off-Base	Former Fire training area 2 (DIA)	MW197	Bi-annual (End-Wet season, and end-Dry season)	**Off-Base** (12 locations)
	Off-Base-north	MW185		
	Rapid Creek	MW191, MW190, MW194, MW195		
	Off-Base-south	MW176, MW180, MW200, MW209		
	Off-Base south west	MW211		
	Off-Base-west	MW210		

4.5 Surface Water Sampling Location Rationale

There are 23 surface water locations identified for ongoing monitoring, including on-Base and off-Base locations (comprising of public land access). The OMP (Coffey, 2019a) will monitor water quality in the surface water systems down gradient of the site (Rapid, Sadgroves, Reichardt and Ludmilla Creek), and site run-off drains (**Table 6**). The on-Base locations were nominated to assess concentrations and flow rates in drains that capture run-off from PFAS source areas or where significant discharge of water has been observed.

Table 6 Surface Water Sample Rationale

Area	Rationale
On-Base	• Assess concentrations and flow rates in drains that capture run-off from PFAS source areas, or where significant discharge of water has been observed. • Monitor concentrations of PFAS in stormwater leaving the Base • Monitor concentrations of PFAS in Rapid Creek

Area	Rationale
	• Monitor medium-term effects of remediation where the FFTA1 plume discharges post wet season
Off-Base	• Monitor spatial and temporal variations in PFAS concentrations in surface water systems down gradient of the site (Rapid, Sadgroves, Reichardt and Ludmilla Creek. • Monitor concentrations of PFAS in Rapid and Ludmilla Creek

4.6 Surface Water Sampling Locations

The surface water monitoring locations have been selected to maintain consistency with the monitoring completed during the interim monitoring events and the investigation phases

Many of the locations have been previously sampled several times, and continued monitoring will provide additional data to assess temporal variability. The locations to be monitored vary between a biannual (twice yearly) and monthly wet season basis and are provided in **Table 7** below, on **Figure 3** in **Appendix B** and **Table 2**, **Appendix C**.

Table 7 Surface Water Sampling Locations

Area	Description	Sampling Location Code	Sampling Frequency	Number of locations
On-Base	Surface water flow – current fire training ground	SW156	Twice yearly (Start-Wet season, end-Wet season)	**On-Base (8 locations)**
	Stormwater pipe - Airside operations	SW160		
	Stormwater– southern boundary	SW162		
	Surface water drain - near Former Fuel Farm 5	SW178		
	Surface water drain - north of Former Fuel Farms 4 & 6	SW181		
	Rapid Creek	SW152		
	Surface water drain - Eastern end of runway	SW170	Monthly sampling through Wet season (Dec – Apr)	
	Drainage from FFTA1	SW312		
Off-Base	Rapid Creek	SW104, SW106, SW108, SW112, SW113	Twice yearly (Start-Wet season, end-Wet season)	**Off-Base (16 locations)**
	DIA drain to Rapid Creek	SW114, SW115, SW168		
	Ludmilla Creek	SW120, SW124, SW125		
	Reichardt Creek	SW132, SW133		
	Drain to Sadgroves Creek	SW143		

Area	Description	Sampling Location Code	Sampling Frequency	Number of locations
	Osgood Drive	SW300	Monthly sampling through Wet season (Dec – Apr)	
	Rapid Creek	SW109	Monthly sampling through Wet season (Dec – Apr) and once in both June and August	

4.7 Biota Sampling Locations

In addition to collection of groundwater and surface water samples, aquatic biota (fish and aquatic invertebrates) sampling will occur to supplement existing datasets and support any future reviews of human exposure risk to ingestion of biota containing PFAS.

The NT Department of Health have issued dietary advisories relating to consumption of fish in Rapid Creek and Ludmilla Creek. Monitoring of PFAS concentrations within fish and aquatic species within Rapid Creek is important to ensure that the health guidance provided is appropriate and continues to be relevant.

Ethics approvals and Fisheries/Parks & Wildlife licences will be obtained prior to biota sample collection.

Target species will be based on those that are recognised as frequently consumed from the following three groups:

- Diadromous or estuarine fish
  (Barramundi, Flathead, Javelin, Sweetlips, Mullet, Rockcod, Queenfish, Jewfish etc)
- Molluscs
  (Longbums [*Telescopium Telescopium*] and Whelk)
- Crustaceans
  (Redclaw Crayfish [*C.quadricarinatus])*

The six suitable locations identified for sample collection, and aquatic biota target species at each location, are presented in **Table 8**, on **Figure 4** in **Appendix B**. and **Table 3** in **Appendix C**.

The sample locations as presented in **Figure 4** (**Appendix B**) are not the exact locations for collection of biota samples but rather the downstream extent of the study reach. The exact location will spread over a couple hundred meters, where possible, but within the same habitat type as the locations identified on **Figure 4** (**Appendix B**) per day of sampling

Target sample numbers from each location are presented in **Table 8**, however the number of samples collected will vary based on what is caught.

Table 8 Aquatic biota target samples

Location	Sample Location Code[1]	Indicator/Target Species	Target sample numbers	Sampling Frequency
Rapid Creek – (Freshwater) - Upstream	BIOFA024/ BIOFA026/ BIOFA028 or new location	Crustaceans	Minimum three of at least 100g	Once yearly (End-Dry season or start-Wet season –

[1] Note: Biota monitoring location ID's provided in the OMP (Coffey, 2019a) were not compliant with the DCMM guidance and have been updated to meet Defence requirements.

Location	Sample Location Code[1]	Indicator/Target Species	Target sample numbers	Sampling Frequency
of Trower Road				October - December)
Ludmilla Creek (Estuarine area)	BIOFA016 or new location	Molluscs	Five composite samples of 10 molluscs	
Rapid Creek mouth (Casuarina Drive)	BIOFA007	Diadromous or estuarine fish	Three samples of each of 5 species of commonly consumed fish (15 total)	
Ludmilla Creek Boat Ramp)	BIOFA018	Diadromous or estuarine fish	Three samples of each of 5 species of commonly consumed fish (15 total)	

4.8 Sample Collection and Handling

4.8.1 Groundwater Sampling

The groundwater sampling methodology and schedule are presented in **Table 9**.

Table 9 Groundwater Sampling Methodology and Schedule

Item	Details
Groundwater gauging	The depth to groundwater will be measured in each monitoring well prior to collection of groundwater samples. Measure depth to water to the nearest mm, measured from the survey mark or highest point of the well casing. Record the date, time, well condition and any odours noted. Gauging of all locations will be conducted prior to groundwater sampling to enable groundwater contours to be developed. The depth to groundwater will also be measured at the time of sampling at each location. All gauging shall be completed within a 24-hour period. LNAPL may be detected at some monitoring locations. For wells with potential LNAPL presence use an interface probe to measure depth to water. In the event that LNAPL is detected, measure the thickness and confirm using a disposable bailer.
Sample Collection Methodology	**Groundwater Monitoring Wells** Groundwater samples will be collected from monitoring wells using no purge methodology with HydraSleeves™ which will be installed within the screened interval, 1 metre below standing water level of each well a minimum of 24 hours prior to sampling. Following sample collection, field parameters will be recorded ex-situ. All Groundwater Wells will be sampled using the HydraSleeves™ method.
QA/QC Samples to be Collected	Field QA/QC samples are to include intra-laboratory duplicate (Duplicate) and inter-laboratory duplicate (Triplicate) samples and rinsate samples. Duplicate and triplicate samples are to be collected at a minimum frequency of 1 in 10 PFAS primary samples. Rinsate samples are to be collected at a rate of one sample per day of sampling when non-dedicated equipment is used, by pouring laboratory supplied PFAS free deionised water over the decontaminated sampling equipment. Additional sample volume is required to be collected to enable the appropriate laboratory QA/QC. For 1-10 primary samples an

Item	Details	
	additional set of samples for a laboratory duplicate and set of samples for a matrix spike analysis must be taken at two separate sites. For 11-20 primary samples an additional set of samples must be taken at a separate site for another duplicate.	
Field Parameters	Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation-reduction potential (ORP), pH and observations of water quality will be recorded for all samples.	
Sample Analysis	All primary samples will be submitted for PFAS extended suite (Department of Defence 2022) using the standard levels of detection.	
Sampling Schedule	As per **Appendix A**.	
Minimum Sampling Volumes	**Bottle**	**Minimum Volume**
	PFAS Bottle (Grey)	2 x 20mL

4.8.2 Surface Water Sampling

The surface water sampling methodology and schedule are presented in **Table 10**

Table 10 Surface Water Sampling Methodology and Schedule

Item	Details
Sample Collection Methodology	Samples are to be collected, using a telescoping sampling pole with laboratory supplied bottle on the end, from approximately 0.5 m below the surface (if possible), with care to minimise collection of sediment or floating materials in the samples. At each location, a new, laboratory supplied container should be lowered into the water using a decontaminated sampling pole, with the cap immediately applied once the container is full. Following sample collection, field parameters will be recorded in-situ by placing the water-meter probe in the surface water collection location.
QA/QC Samples to be Collected	Field QA/QC samples are to include intra-laboratory duplicate (Duplicate) and inter-laboratory duplicate (Triplicate) samples and rinsate samples. Duplicate and triplicate samples are to be collected at a minimum frequency of 1 in 10 PFAS primary samples. Rinsate samples are to be collected at a rate of one sample per day of sampling when non-dedicated equipment is used by pouring laboratory supplied PFAS free deionised (DI) water over the decontaminated sampling equipment. Additional sample volume is required to be collected to enable the appropriate laboratory QA/QC**.**
Field Parameters	Temperature, EC, DO, ORP, , pH and observations of water quality will be recorded for all samples.
Sample Analysis	All primary samples will be submitted for PFAS Full suite (Department of Defence 2022) using the standard levels of detection.
Sampling Schedule	The monitoring will include 9 monitoring events at Off-Base locations and 7 monitoring events at on-Base locations on an annual basis. Sampling will be completed nominally December/January (Q1, undertaken as soon as practicable after a first flush rain event) and March (Q2), corresponding to start and end of Wet Season (respectively).

4.8.3 Biota Sampling

The biota sampling methodology and schedule are presented in Table 11.

Table 11 Biota Sampling Methodology and Schedule

Item	Details
Sample Collection Methodology	Estuarine fish will be collected using 4-6-inch gill nets set three hours before low tide. Nets will be continuously monitored from a small boat and cleared when movement is detected. Non-target species will be released immediately. Selected biota will be identified, measured, weighed and euthanized humanely according to the animal ethics permit conditions. Redclaw will be captured using Opera House traps baited with raw beef (purchased from supermarket). Traps will be set overnight in freshwater pools and collected early morning. Longbums will be hand-collected during low tide from the mangroves. Redclaw and Longbums will be rinsed, placed in snap-lock bags and euthanised by freezing. Samples will be prepared based on the following procedure: • Rinse equipment with PFAS-free DI water • Store samples in snap-lock bags until preparation • Weigh, measure and record species and location caught • Target fish and opportunistic catch species - Use opened bag as board cover - Clean knife/blade with DI water - Collect 50 – 100 g samples per sample collection bag for each species following lab specifications for total number of samples per species. - For large fish the complete tissue samples of edible flesh should be collected. Samples from large fish should not be composited if possible. - For smaller fish, samples need to be provided whole with entrails removed. Head and tail can be removed from smaller fish where necessary for placing in bags. - Tissue from the same species caught in the same area may be composited as a single sample if individuals do not meet 50g minimum - Collect rinsate sample after cleaning reusable equipment (run DI water over equipment and collect in PFAS sample bottle). Fill bottle (minimum half filled) • For Redclaw Crayfish - Rinse in DI water - Composite whole as 50-100g samples (about 3-5 individuals per sample). • For Longbum - Place shells inside a sample bag and carefully smash shells with a hammer, then extract tissue with forceps - Wash tissue with DI water - Composite 10 individuals as a sample.

Item	Details
	• Double bag all samples and label inner bag • Freeze and pack in eskies with frozen water bottles.
QA/QC Samples to be Collected	Quality control samples in the form of rinsate blanks will be collected from the sampling and processing equipment from each of the sampling areas to understand if there is the potential for cross contamination from the materials being used in sampling. Split samples will be kept frozen to allow additional laboratory checking if required. Duplicate samples will be collected from large fish across different species, if possible, at a rate of one duplicate sample for every ten fish sampled. Duplicate samples will be collected only from fish where a primary complete sample can be taken from one fillet side, and the duplicate sample can be collected from the opposite fillet side. No duplicate samples will be taken from any target species that are composited.
Sample Analysis	Samples will be prepared for analysis by Eco Logical at the Department of Fisheries laboratory prior to dispatching to the primary laboratory. This will include removal of scales/shell, head, and internal organs. Fillets will be taken with skin intact and homogenised prior to sub-sampling and analysis. All whole samples and composites will be tested for the extended suite (Department of Defence 2022) of PFAS.
Sampling Schedule	The monitoring will include annual monitoring events with sampling completed October/December (Q4), corresponding to end of Dry season / start of Wet season.

4.8.4 Sample Handling and Transport to Laboratory

AECOM personnel will attempt to reduce heterogeneity in the sample media matrix by dividing the sample collected between primary and inter/intra-laboratory collection jars or bottles during sampling. All samples will be placed on ice in eskies immediately after sampling. Biota samples will be stored in double zip-lock bags, frozen and packed in eskies with frozen water bottle ice bricks.

All samples will be kept, if possible, at approximately 4°C during transit to the laboratory. Samples will be transported directly to the laboratory for analytical testing under standard Chain of Custody (CoC) procedures. Primary and field QA/QC samples (except inter-laboratory duplicate samples) will be analysed by Australian Laboratory Services (ALS), a National Association of Testing Authorities (NATA) accredited laboratory. The inter-laboratory duplicate samples, if feasible to collect, will be analysed by National Measurement Institute (NMI), also a NATA accredited laboratory. Due to the nature of biota samples it isn't always feasible to collect inter-laboratory samples, however, field staff will attempt to collect inter-laboratory samples if enough biota sample material is available.

Prior to sampling, assessment of the analytical holding times will be made, and the sampling planned accordingly to ensure that holding times are not breached or minimised.

4.9 Calibration

The water quality meter will be calibrated prior to field mobilisation for field activities with relevant solutions, including pH, EC and ORP. The calibration will be in accordance with manufacturers' instructions or NATA publication "General Requirements for Registration: Supplementary Requirement: Chemical Testing (NATA 1993) and Technical Note N0. 19 (NATA 1994)". Where satisfactory calibration cannot be achieved, the water quality data will not be used for interpretive purposes.

Calibration details will be recorded on a calibration record sheet and included in the Sampling Events Factual Reports.

4.10 Logistics

The laboratory sample containers will be shipped from the laboratory to the AECOM office in Darwin prior to the commencement of fieldwork. All primary samples will be transported by an ALS supplied courier at the completion of fieldwork. All inter-laboratory duplicate samples will be transported with the primary samples, then separated and couriered directly to the secondary laboratory (NMI, Sydney) by ALS under a separate CoC for analysis

4.11 Analytical Suite and Laboratory Analysis Methods

4.11.1 Laboratory NATA Accreditation Details

Laboratory Sampling analysis is to be conducted using NATA certified laboratories which will implement a quality control plan in accordance with NEPM (2013).

4.11.2 Analytical schedule

All media sampled shall be analysed for the extended PFAS suite (Department of Defence 2022) with standard LOR as outlined in **Table 12** below.

Table 12 Sample Analytical Suite for PFAS

PFAS Group	Compound	CAS No.
Perfluoroalkyl 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
Perfluoroalkyl 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

PFAS Group	Compound	CAS No.
	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

The current standard laboratory limits of reporting (LOR) are described in **Table 13** below.

Table 13 Laboratory Limits of Reporting

Sample Media	Parameter	Technique/Method Reference	LOR*
Groundwater and Surface Water	Extended PFAS Suite (Department of Defence 2022)	LC/MS-MS	0.01 – 1.0 µg/L
Biota	Extended PFAS Suite (Department of Defence 2022)	EP231X	0.5 – 5 µg/kg

LC/MS-MS = Liquid chromatography–mass spectrometry

4.12 Sample Nomenclature

In order to meet Defence data management requirements presented in **Section 4.0** of **Annex L** of the **Defence Contamination Management Manual** (**DCMM**) (Department of Defence, 2021), a consistent sample nomenclature has been adopted for the program. All samples collected from each location should have a unique identification. The minimum mandatory requirements for the sample identifications are outlined in **Table 14**, further examples relevant to this SAQP are outlined in **Table 15**.

Table 14 Mandatory requirements for Defence sample nomenclature

Sample ID	Location ID
PPPP_XX000_ZZZ_YYMMDD	XX000
e.g. 1302_BH001_1.2_190207	e.g. BH001
Reference	
PPP – property identification (4-digits) XX – type of sample recovery 000 – location specific identification ZZZ – indicates the depth that the sample has been collected (in meters below ground level [bgl] YYMMDD – date of sample collection	

Table 15 Sample Abbreviations

Abbreviation	Meaning	Matrix	Examples of Methods of Sampling	Example Sample Name/Comments
MW	Monitoring Well	Water or Soil	Groundwater	1302_MW104_180630
SW	Surface water	Water	Surface water	1302_SW002_180630

Abbreviation	Meaning	Matrix	Examples of Methods of Sampling	Example Sample Name/Comments
BIOAFA	Biota	Aquatic Fauna	Fish, crustaceans, invertebrates and their products; blood, roe etc	1302_BIOAFA001_190806

4.12.1 Quality Assurance / Quality Control Sample Nomenclature

The naming convention for QA/QC samples are outlined in **Table 16**, below

Table 16 QA/QC sample naming convention

QA/QC Sample Type	Naming Convention (where XX is a sequential number independent of sample or matrix type)
Quality control duplicate samples	
Blind duplicate (duplicate)	1302_QC1XX_YYMMDD
Inter-Laboratory duplicate (triplicate)	1302_QC2XX_YYMMDD
Quality assurance samples	
Rinsate	1302_QC3XX_YYMMDD
Field Blank	1302_QC4XX_YYMMDD
Trip Blank	1302_QC5XX_YYMMDD

4.13 Defence ESdat Requirements

Defence has contracted Earth Science Information Systems (EScIS), to provide contamination data management services through a cloud instance of its ESdat product.

All OMP (Coffey, 2019a) field and laboratory data collected by AECOM will be uploaded, stored and managed in Defence's ESdat database in accordance with Section 6 of Annex L to the Defence Contamination Management Manual. AECOM will refer to historical investigation data to ensure consistent location codes are used to enable analysis of data trends. Where required under Annex L, non-compliant location codes will be resolved under direction from Defence.

AECOM will upload the data from each monitoring event into ESdat prior to submitting the Sampling Event Factual Report.

4.14 Adopted Screening Criteria

PFAS screening values have been adopted for groundwater and surface water from the Defence OMP (Coffey, 2019a) and are derived from the following documents:

- HEPA (2020) PFAS NEMP 2.0
- Department of Health (DoH), 2019. Health Based Guidance Values for PFAS for use in site investigations in Australia. September 2019.
- National Health and Medical Research Council (NHMRC), 2019. Guidance on PFAS in Recreational Water. August 2019 (NHMRC 2019)
- National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013 (ASC NEPM)

Adopted PFAS screening values are provided in the **Table 17**.

Table 17 Adopted groundwater and surface water screening values (µg/L)

Pathway	Compound	Criteria	Comment / Reference
Drinking water - groundwater	PFOS + PFHxS	0.07 µg/L	The values presented in the PFAS NEMP 2.0, 2020 are from DoH 2017, which published final health-based guidance values for PFAS for use in site investigations in Australia. DoH utilised the TDI for PFOS and PFOA from FSANZ, 2017 and the methodology described in Chapter 6.3.3 of the National Health and Medical Research Council's (NHMRC) Australian Drinking Water Guidelines (ADWG), 2016 to determine drinking water values. For PFHxS, DoH 2017 noted that '*FSANZ concluded that there was not enough toxicological and epidemiological information to justify establishing a tolerable daily intake. However, as a precaution, and for the purposes of site investigations, the PFOS tolerable daily intake should apply to PFHxS. In practice, this means that the level of PFHxS exposure should be added to the level of PFOS exposure; and this combined level be compared to the tolerable daily intake for PFOS*'. *All groundwater results will be compared to these criteria.*
	PFOA	0.56 µg/L	
Recreational use – surface water	PFOS + PFHxS	2 µg/L	The values presented in the PFAS NEMP 2.0, 2020 are from the NHMRC guidance on the assessment of PFAS in surface water released in August 2019. Rather than adopting an ingestion rate of 0.2 L of water per day (as per the ADWG formula), NHMRC adjusted this rate with consideration of an event frequency (150 events / year) to calculate an annual ingestion rate of 30 L per year. *All surface water results will be compared to these criteria.*
	PFOA	10 µg/L	
–Intake – food (Crustaceans)	Sum of PFOS+PFHxS	65 µg/kg	The values are from the Department of Health, 2019. *All biota samples will be compared to these criteria*.
	PFOA	520 µg/kg	
Intake – food (Finfish)	Sum of PFOS+PFHxS	5.2 µg/kg	
	PFOA	41 µg/kg	

Table 18 PFAS criteria summary: Ecological

Media	Pathway	Chemical	Criteria	Comment/Reference
Water	Freshwater	PFOS	0.00023 µg/L	HEPA (2020) NEMP 2.0 99% species protection
		PFOA	19 µg/L	HEPA (2020) NEMP 2.0 99% species protection

Note: HEPA (2020) notes that the 99% species protection level for PFOS is close to the level of detection. Agencies may wish to apply a 'detect' threshold in such circumstances rather than a quantified measurement.

4.15 Waste Management

Due to the proposed "no purge" sampling methodology, it is not anticipated that significant volumes of liquid waste would be generated that would require management or disposal.

Single use sampling equipment and any waste generated during works (including generation of wastewater or soil) will be managed and/or disposed of appropriately in accordance with Territory waste disposal requirements.

4.16 Quality Assurance/Quality Control Sampling

The recommendations within this document are based on the guidelines presented in:

- NEPM [the National Environment Protection (Assessment of Site Contamination) Measure 1999] as amended in 2013.
- HEPA (2020) PFAS National Environmental Management Plan (NEMP) 2.0
- AS4482.1 Guide to the sampling and investigation of potentially contaminated soil, Part 1: Non-Volatile and Semi-Volatile Substances.
- AS4482.2 Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile Substances.
- AS/NZ 5667.1 Water Quality Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handing of samples.
- ANZG (2018). Guidelines for Fresh and Marine Water Quality.
- ANZECC& ARMCANZ (2000). Australian and New Zealand guidelines for fresh and marine water quality.
- WA DER (2016). Interim Guideline on the Assessment and Management of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS).

4.16.1 Field Intra- and Inter-laboratory Duplicate Samples

Intra-laboratory field duplicates will be collected at a frequency of one per ten samples that are collected (10%). Inter-laboratory field duplicates will be collected for groundwater and surface water samples at a rate of one sample per ten collected (10%). Repeatability will be assessed by relative percentage difference (RPD) between primary and duplicate samples. If RPD has variability greater than 30% the sample will be reviewed. The minimum volume of intra- and inter-duplicate samples is to follow the below requirements set by the primary and secondary laboratories.

Biota intra-laboratory duplicate samples will be collected where fish is large enough, left and right fillets will be used as duplicate samples for quality control analysis. Intra-laboratory duplicates will be collected at a minimum frequency of 1 per 10 samples, respectively. Due to sample size of fish fillets not being large enough to split into primary, intra-duplicate, and inter-duplicate samples, inter-laboratory duplicate samples are not required.

4.16.2 Rinsate Samples

Rinsate samples will be prepared in the field using laboratory prepared bottles and PFAS free deionised water, poured over (if any) decontaminated sampling equipment (e.g., oil/water interface probe or hand trowel). Rinsate samples will be collected at a frequency of one per sampling day, where reusable sampling equipment has been used.

4.16.3 Field Blank Samples

Field blank samples will be prepared in the field using laboratory prepared bottles and PFAS free deionised water to capture any potential air-borne contaminants of concern. These will be collected at a frequency of one per sampling day for water sampling.

4.16.4 Trip Blank Samples

The trip blank water samples will be laboratory supplied and prepared in a clean environment, taken at a rate of one per esky, and will remain within the sample esky during the entire sampling event until arriving at the laboratory for analysis.

4.16.5 Laboratory QA/QC

Additional sample volumes will be obtained to enable laboratory QAQC (duplicates and matrix spike) for PFAS analysis. The frequency of additional samples is 2:10 and 3:20, where two additional sets (2x20mL) are required per 10 primary samples, or three sets per 20 primary samples.

4.17 Fieldwork Documentation

4.17.1 Field Observations and Results

Field notes will be maintained to record all field sampling events and include observations made at each sample location. Field notes will include information specific to the sample media as follows:

- Groundwater Samples – comments on the observed characteristics of the sample (e.g. colour, turbidity, odour, sheen) and reported field water quality parameters (pH, EC, DO, ORP, temperature) will be recorded at regular intervals;
- Surface Water Samples – comments on the observed characteristics of the sample (e.g. colour, turbidity, odour, sheen), relative flow velocity, descriptions of water body, channel width, and field water quality parameters (pH, EC, DO, ORP, temperature) will be recorded; and
- Biota samples – comments on field conditions (weather, tidal movements) and the observed characteristics of the sample

The geo-coordinates for each sample location will be noted. The location of quality control (e.g. duplicate and inter-laboratory duplicate) sample collection points will also be noted.

AECOM's tablet-based Environmental Data Collection and Analysis ('EDCA') tool will be utilized by field staff to capture consistent field data based on project specific requirements, minimise potential data transcription errors, allow on-the-spot identification of potentially erroneous data in comparison to historical data and facilitate efficient data transfer to multiple data systems including ESdat.

4.17.2 Sample Labels

Sample containers will be labelled, as a minimum, with the following information:

- AECOM project number;
- Name of sampler;
- Sample ID;
- Date of sample collection; and
- Filtered vs non-filtered (for water samples only).

An indelible felt pen will be used for labelling, to ensure that the lettering is not erased during transit to the laboratory.

AECOM will utilize the tablet-based EDCA tool to streamline sample labelling and chain of custody (CoC) creation to ensure compliant sample IDs are used in the field.

4.17.3 Chain of Custody Forms

A CoC form will be completed, documenting the sample identification number and analytes. The CoC documents the chain of events from sample collection to delivery at the laboratory and provides a traceable account of sample handling. The CoC form will be signed by both the sample collector and the receiving laboratory.

The CoC form will include the following information:

- Job number (Note: the name of the site is not identified for confidentiality purposes);

- Date and time of sample collection;
- Sample ID;
- Type of containers;
- Name of sampler;
- Laboratory to be used;
- Analyses required;
- Any comments; and
- Signatures of the sampler and laboratory receiver.

In the event that additional samples are collected during the field investigations due to observations made by the field team, (i.e. samples not proposed in this SAQP), Defence will be provided the rationale for collection of those samples and proposed laboratory analyses. Defence approval will be sought to include these samples on the CoC and to dispatch these samples to the laboratory.

Upon receipt of the original documents accompanying the samples at the laboratory, the laboratory will provide a sample receipt document (noting the temperature of samples upon receipt, analyses required and any non-conformances) and return the signed CoC form to confirm analyses to be performed and the due date for the analytical results.

4.17.4 Sampling Documentation

Field sampling sheets will be completed for each location, and will include the following information (as appropriate for the media being sampled):

- Name of sampler;
- Sample location;
- Date /time of monitoring/ sampling;
- Sampling method;
- Observations of the sampled media; and
- Calibration records.

Records of all equipment calibration will be included in the Sampling Event Factual Reports.

4.18 Reporting

4.18.1 Sampling Event Factual Report

No later than four weeks following the completion of each sampling event, AECOM will prepare and submit a Sampling Event Factual Report to Defence. A sampling event is defined as all sampling activities occurring in association with a PMAP defined season (i.e. end of dry / start of wet season), which can include groundwater, surface water, and / or biota sampling occurring at different times throughout a specified season as is appropriate for each sampling type. Each Sampling Event Factual Report will include:

- details of the scope of monitoring completed
- a description of the sampling methodologies used
- a summary of observations made while sampling (e.g. any visual or olfactory observations that may indicate impacts to surface water or groundwater)
- a 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
- a presentation of the analysis results in a table that includes comparisons with PFAS guidelines, highlighting any significant statistical deviations from historical monitoring and investigation data

- a presentation of the reduced groundwater levels for the event on a figure with inferred contours and inferred groundwater flow direction
- discussion of the analytical data quality, including review of the quality control sampling results and laboratory quality control data
- inclusion of the following information as attachments:
    - Groundwater, surface water and biota sampling forms including field water quality parameter measurements;
        i. Chain of custody forms;
        ii. Laboratory analytical certificates; and
        iii. Equipment calibration certificates.

4.18.2 Annual Monitoring and Management Report

At the end of each 12-month monitoring period, AECOM will prepare and submit an Annual Interpretive Report to Defence. Each Interpretive Report will include:

- evidence of compliance with the requirements of the SAQP and meeting stated objectives of the OMP (Coffey, 2019a)
- 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 (Coffey, 2019a)
- assessment and commentary on appropriate QA/QC procedures
- a review of the Conceptual Site Model and provision of a revised Conceptual Site Model if required
- data interpretation, including trends in groundwater concentration, gradient and flow directions
- assessment of statistically based trends that may inform decision making when it comes to the revision of an OMP (Coffey, 2019a)
- 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 (Coffey, 2019a) and/or PMAP (Coffey, 2019a) review, or other action.

4.18.3 Following sampling occurring on Darwin International Airport controlled property, a letter report will be provided to Defence to send to Darwin International Airport management. This letter report will not be included in any other report and are strictly for communicating results to Darwin International Airport regarding results from samples collected from the individual stakeholders' properties. OMP Review

Review of ongoing management at the site for the release to the government and public stakeholders. The report should contain the following information:

- Identification of improvements to the OMP (Coffey, 2019a) procedures in light of observed variability or concentration changes
- Review of data gaps and nomination of measures to address significant gaps
- Review of Changes in Australian or international practice and guidance in PFAS investigation
- Reporting of changed conditions that require mitigation or warrant review of risk assessments

4.19 Deviations from OMP

While the scope of works and methodology described in this SAQP are generally consistent with that presented in the OMP (Coffey, 2019a), a number of points of deviation are noted (refer to **Table 19** below).

Table 19 Deviations from OMP

No.	Description	Rationale
1	Adoption of Revised Recreational Screening Criteria for PFOS+PFHxS and PFOA (2019)	Following the release of the OMP (Coffey, 2019a) in July 2019, the National Health and Medical Research Council (NHMRC), published guidance on PFAS in Recreational Water. The adopted screening criteria for PFOS+PFHxS and PFOA in surface water have therefore been revised to 2 µg/L and 10 µg/L, respectively. This is reflected in Section 4.13.
2	Sampling of groundwater and surface water for the non-PFAS suite (Department of Defence 2022). (2021)	Defence notified the AECOM project management team via email on 27th January 2021 that "*all future OMP sampling events across all sites, the inclusion of non-PFAS analysis will need to be justified in advance and agreed by Defence Tech Policy through review of the SAQP*".
2	Sampling of monitoring location MW190 (2021)	Monitoring location MW193 was destroyed during construction activities related to road improvements north of DIA. MW190 was determined to be the best existing alternative location to replace MW193.
3	Sampling of monitoring location SW152 (2021)	Monitoring location SW101 has been made inaccessible through the installation of a security fence surrounding the airfield areas of RAAF Base Darwin. As such, the closest accessible point to collect surface water samples from upper Rapid Creek downgradient of the runway areas is SW152.
4	Sampling of monitoring location MW405 (2021)	Monitoring location MW405 was destroyed during construction activities related to the AIR7000 redevelopment project. MW215 was determined to be the best existing alternative location to replace MW405.
5	Sampling of monitoring locations MW451, MW452, MW453 and MW454 (2022)	Defence notified the AECOM project management team with the recommendation to include four new monitoring wells to the OMP (Coffey, 2019a) scope of work to address identified data gaps and recommendations from previous sampling rounds. The proposed wells will be sampled biannually, at the end of the wet season (March) and the end of the dry season (Oct - Dec).
6	Increased sampling frequency of existing monitoring locations SW109 and SW170 (2022)	Defence notified the AECOM project management team with the recommendation to conduct additional sampling of existing locations to address identified data gaps and recommendations from previous sampling rounds. Monthly sampling of SW170 and SW109 must be undertaken throughout the wet season (Dec – April). Monthly samples must also be recorded for SW109 during June and August.
7	Additional surface water location SW300 (2022)	Defence notified the AECOM project management team with the recommendation to include one additional surface water locations to the OMP (Coffey, 2019a) scope of works to address identified data gaps and recommendations from previous sampling rounds.

No.	Description	Rationale
8	Additional surface water location SW312 (2022)	Defence notified the AECOM project management team with the recommendation to include one additional surface water locations to the OMP (Coffey, 2019a) scope of works to address identified data gaps and recommendations from previous sampling rounds.

5.0 References

ANZG (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.*
ANZECC&ARMCANZ (2000). *Australian guidelines for water quality monitoring and reporting*.

ASC NEPM, 2013. *Schedule B2. National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) Schedule B2 Guideline on Site Characterisation*.

ASC NEPM, 2013. *Schedule B4. National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) Schedule B4 Guideline on Site-Specific Health Risk Assessment Methodology*.

ASC NEPM, 2013. *Schedule B7. National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) Schedule B7 Guideline on Derivation of Health-Based Investigation Levels*.

AS4482.1 *Guide to the sampling and investigation of potentially contaminated soil, Part 1: Non-Volatile and Semi-Volatile Substances*.

AS4482.2 *Guide to the sampling and investigation of potentially contaminated soil, Part 2: Volatile Substances*.

AS/NZ 5667.1 *Water Quality Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handing of samples*.

Coffey (2019a), *PFAS Management Area Plan - RAAF Base Darwin* prepared for Department of Defence

Coffey (2019b), *RAAF Base Darwin – Interim PFAS Monitoring Report - Sampling conducted December 2018* (*754-MELEN199421-R14 – V1*) prepared for Department of Defence

Coffey (2019c), *RAAF Base Darwin – Interim PFAS Monitoring Report - Sampling conducted March 2019* (754-MELEN199421-R15 – V2) prepared for Department of Defence

Coffey (2018a). *RAAF Base Darwin Human Health Risk Assessment (HHRA)* (754-MELEN199421_R07) prepared for Department of Defence

Coffey (2018b). *RAAF Base Darwin Detailed Site Investigation (DSI) Report* (754-MELEN199421_R05) prepared for Department of Defence

Coffey (2018c). *RAAF Base Darwin Supplementary Detailed Site Investigation (DSI) Report* (754-MELEN199420_R09) prepared for Department of Defence

Coffey (2018d). *RAAF Base Darwin Ecological Risk Assessment (ERA)* (754-MELEN199420_R05) prepared for Department of Defence

Department of Defence, June 2022, *Guidance Document E Standard PFAS Analytical Suite.*

Department of Defence, 2016. *Routine Environment Water Quality Monitoring Manual.*

Department of Defence, July 2018, Amended June 2021 , *Defence Contamination Management Manual.*

Department of Health (DoH) (2019), *Health Based Guidance Values for PFAS for use in site investigations in Australia.* September 2019.

Heads of EPAs Australia and New Zealand (HEPA) 2020. *PFAS National Environmental Management Plan Version 2.0*. January 2020

National Health and Medical Research Council (NHMRC) (2019). Guidance on PFAS in Recreational Water. August 2019

Department of Environment and Natural Resources, *Water Act 1992* (NT)

Department of Environment and Natural Resources, *Waste Management And Pollution Control Act 1998* (NT)

Appendix A

Schedule

RAAF Base Darwin Sampling Schedule

			Wet Season					Dry Season						
			Q4/Q1		Q2			Q3			Q4			Q4/Q1
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
RAAF Darwin	Fieldwork	Groundwater			Biannual end of wet season On-Base/ Off-Base							Biannual end of dry season On-Base/ Off-Base		
		Surface Water			End of wet season Off-Base / On-Base									Start of wet season Off-Base / On-Base
			Monthly wet season Off-Base/On-Base	Monthly wet season Off-Base/On-Base	Monthly wet season Off-Base/On-Base	Monthly wet season Off-Base/On-Base								Monthly wet season Off- Base / On-Base
								1st monthly dry season sampling Off-Base		2nd monthly dry season sampling Off-Base				
		Aquatic Biota										Annual Aquatic Biota Off-base		

Appendix B

Figures

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DATUM GDA 1994, PROJECTION MGA ZONE 52

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Kilometres

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LEGEND

- RAAF Base Darwin
- Source Area
- Management Area
- Drainage
- Highway

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 Esri

Department of Defence
RAAF BASE DARWIN
SAMPLING ANALYSIS QUALITY PLAN

2022 PFAS Management Area

PROJECT ID	60612561
CREATED BY	ROB.MCGREGOR
LAST MODIFIED	ROB.MCGREGOR 19 DEC 2022
VERSION:	1

Figure
1

A3 size

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Kilometres

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LEGEND

- RAAF Darwin Airside Zone
- RAAF Base Darwin
- Watercourses
- Bi-annual Monitoring Locations

Note:
Biannual sampling consists of biannual end of wet season On-Base/Off-Base sampling event and biannual end of dry season On-Base/Off-Base sampling event.

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
RAAF BASE DARWIN
SAMPLING ANALYSIS QUALITY PLAN

On-going Monitoring Plan Groundwater

PROJECT ID	60612561
CREATED BY	ROB.MCGREGOR
LAST MODIFIED	ROB.MCGREGOR 19 DEC 2022
VERSION	2

Figure 2

A3 size

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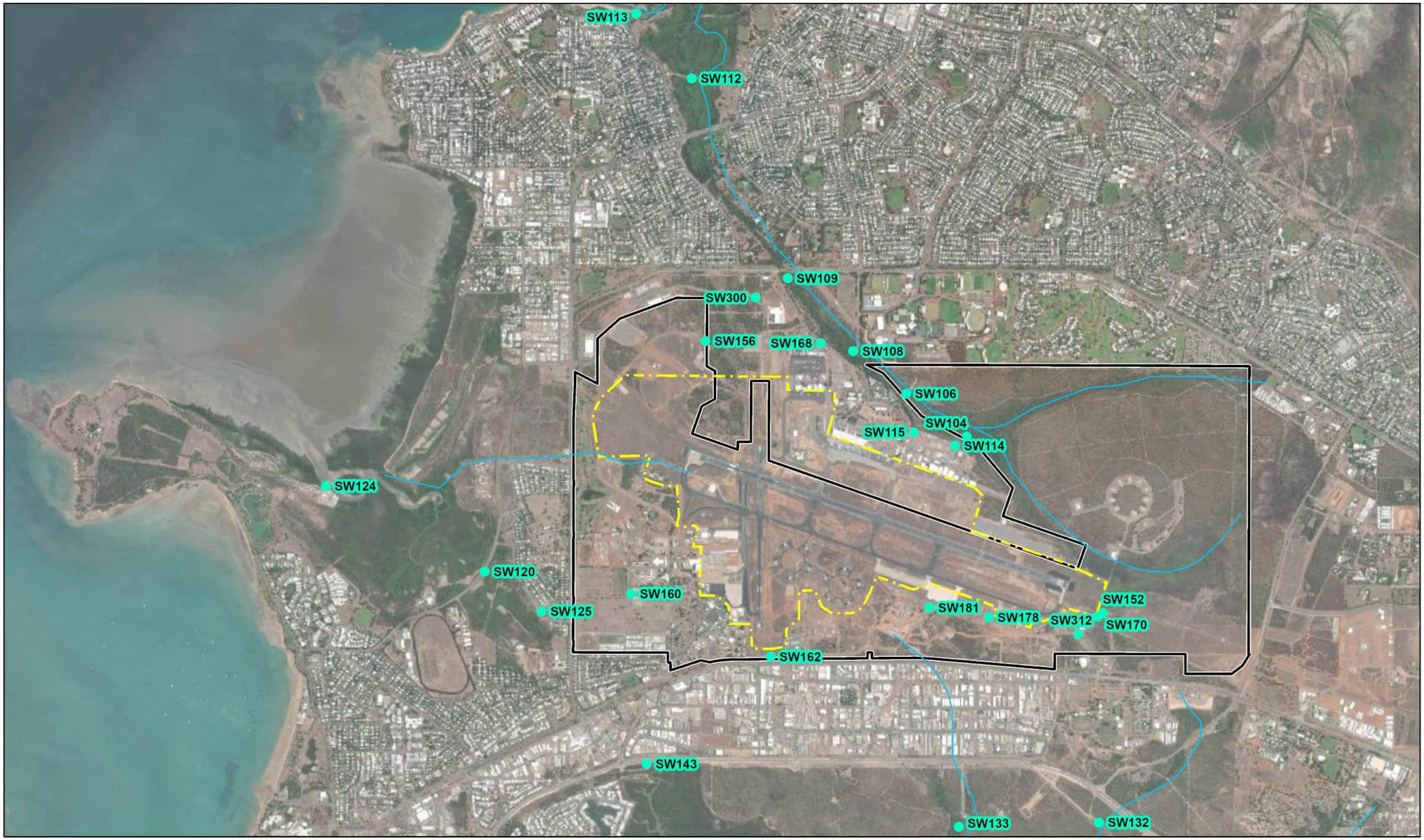

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Kilometres

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LEGEND

- RAAF Base Darwin
- RAAF Darwin Airside Zone
- Watercourses
- Surface Water Sample Locations

Note:
- Biannual sampling consists of biannual end of wet season On-Base/Off-Base sampling event and biannual end of dry season On-Base/Off-Base sampling event.
- Monitoring locations SW170, SW300 and SW312 sampled monthly from December through April.
- Monitoring location SW109 sampled monthly from December through April, and in June and August.

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
RAAF BASE DARWIN
SAMPLING ANALYSIS QUALITY PLAN

ON-GOING MONITORING PLAN
SURFACE WATER

PROJECT ID	60612561
CREATED BY	ROB.MCGREGOR
LAST MODIFIED	ROB.MCGREGOR 19 DEC 2022
VERSION	2

Figure 3

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DATUM GDA 1994, PROJECTION MGA ZONE 52

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Kilometers

1:35,000 (when printed at A3)

Legend

- Annual biota sample locations
- Watercourse
- Highway
- Road
- RAAFBaseDarwin_SiteBoundary

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
RAAF BASE DARWIN
SAMPLING ANALYSIS QUALITY PLAN

ON-GOING MONITORING PLAN
BIOTA

PROJECT ID	60612561
CREATED BY	JD
LAST MODIFIED	BathurstJ29 Oct 2019
VERSION:	1

Figure 4

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Appendix C

Monitoring Location Tables

Table 1- RAAF Base Darwin groundwater monitoring locations

Location Code	Legacy Name	On/Off Base	Location	Easting	Northing	Latitude	Longitude	Alternative	Rationale/Description
MW215	201_MW04	On-Base	Former Fuel Farm 1	702818.5	8626602	-12.4172	130.8657	MW121	Monitoring PFAS in source area Former Fuel Farm 1 and Hanger 31
MW297	206_MW05	On-Base	Former Fuel Farm 5	705345.5	8626031	-12.4222	130.889	MW296 (206_MW04)	Monitoring PFAS within source area Former Fuel Farm 5
MW303	207_MW04	On-Base	Former Fuel Farms 4 & 6	704505.4	8626192	-12.4208	130.8813	MW302 (207_MW05)	Monitoring PFAS within source area Former Fuel Farms 4 & 6
MW422	-	On-Base	Former Fire Training Area 1	705840.9	8625904	-12.4233	130.8936	MW235 (241_MW02)	Monitoring PFAS in source area Former Fire Training Area 1
MW240	243_MW02	On-Base	Current Fire Training Area	702895.2	8628227	-12.4025	130.8663	Reinstall	Monitoring PFAS in source area Current fire training area
MW241	243_MW03	On-Base	Current Fire Training Area	702933	8628267	-12.4021	130.8667	Reinstall	Monitoring PFAS down-gradient of Current fire training area
MW103		On-Base	RAAF Fire Station	702481.9	8626317	-12.4198	130.8627	MW100	Monitoring PFAS in source area RAAF Fire Station
MW107		On-Base	Down-gradient of Hangar 31	702589.3	8626487	-12.4183	130.8636	MW108	Monitoring PFAS from source area Hangar 31
MW112		On-Base	North of Former Fuel Farm 5	705524.8	8626321	-12.4196	130.8907	Reinstall	Monitoring PFAS on plume centreline from Former Fuel Farm 5
MW115		On-Base	Former ARFF Fire Station	704057.2	8626597	-12.4172	130.8771	MW116	Monitoring PFAS within source area Former ARFF Fire station
MW128		On-Base	Down-gradient of RAAF Fire Station	702075.7	8625981	-12.4229	130.859	Reinstall	Monitoring PFAS migrating down-gradient from source area Former RAAF fire station
MW133		On-Base	Former Fuel Farms 4 & 6	704705.6	8626110	-12.4215	130.8831	MW292 (205_MW04)	Monitoring PFAS in groundwater in source area Former Fuel Farm 4 & 6
MW139		On-Base	Former Fire Training Area 1	705834.1	8625786	-12.4244	130.8935	reinstall	Monitoring PFAS leaving Former Fire Training Area 1 to the south
MW141		On-Base	Southern boundary of site	705231.1	8625727	-12.425	130.888	MW231 (234_MW04)	Monitoring PFAS migrating south off the Base
MW144		On-Base	Southern boundary of site	704149.6	8625760	-12.4247	130.878	MW143	Monitoring PFAS migrating south off the Base
MW148		On-Base	Western boundary of site	701819.7	8626390	-12.4192	130.8566	MW201	Monitoring PFAS migrating off- Base to the west
MW156		On-Base	Rapid Creek - Eastern end	706047.4	8626483	-12.4181	130.8954	reinstall	Monitoring PFAS in groundwater prior to discharge to Rapid Creek
MW205		On-Base	North of Former Fuel Farms 4 & 6	704625.9	8626589	-12.4172	130.8824	reinstall	Monitoring PFAS in plume centreline from source area Former Fuel Farms 4 & 6
MW451		On-Base	On-Base - west	701816.5	8626496.1	-12.4182	130.8565	reinstall	Monitoring PFAS in groundwater across the western boundary
MW452		On-Base	On-Base - west	701819.3	8626284.1	-12.4201	130.8565	reinstall	Monitoring PFAS in groundwater across the western boundary
MW453		On-Base	On-Base – northwest	702876.1	8628267.7	-12.4021	130.8661	reinstall	Monitoring PFAS flux to the north at the CFTA
MW454		On-Base	On-Base – southeast	705844.7	8626071.9	-12.4218	130.8936	reinstall	Monitoring PFAS plume from the centreline down-gradient of the FFTA1
MW176		Off-Base	Off-Base-south	703244.1	8625346	-12.4285	130.8697	reinstall	Monitoring PFAS plume extent off- Base
MW180		Off-Base	Off-Base-south	705496.7	8625510	-12.4269	130.8904	reinstall	Monitoring PFAS plume extent off- Base
MW185		Off-Base	Off-Base north	703156.2	8629359	-12.3923	130.8687	MW189	Monitoring PFAS plume extent off- Base
MW191		Off-Base	Rapid Creek	703585.7	8628730	-12.3979	130.8727	reinstall	Monitoring PFAS in groundwater prior to discharge to Rapid Creek
MW190		Off-Base	Rapid Creek	703954.3	8628326	-12.4016	130.8762	reinstall	Monitoring PFAS in groundwater prior to discharge to Rapid Creek
MW194		Off-Base	Rapid Creek	705423.9	8627115	-12.4124	130.8897	reinstall	Monitoring PFAS in groundwater prior to discharge to Rapid Creek

Location Code	Legacy Name	On/Off Base	Location	Easting	Northing	Latitude	Longitude	Alternative	Rationale/Description
MW195		Off-Base	Rapid Creek	705166.5	8627448	-12.4094	130.8873	reinstall	Monitoring PFAS in groundwater prior to discharge to Rapid Creek
MW197		Off-Base	Former Fire training area 2 (DIA)	703180.6	8627940	-12.4051	130.869	MW236 (242_MW02)	Monitoring PFAS in groundwater at source area Former Fire training area 2
MW200		Off-Base	Off-Base-south	704086.9	8625327	-12.4286	130.8775	reinstall	Monitoring PFAS plume extent off- Base
MW209		Off-Base	Off-Base-south	702102.4	8625716	-12.4253	130.8592	reinstall	Monitoring PFAS plume extent in the Narrows (off-Base)
MW210		Off-Base	Off-Base-west	701388.7	8626600	-12.4173	130.8526	reinstall	Monitoring PFAS in Ludmilla (off Bagot/ -Base plume)
MW211		Off-Base	Off-Base-southwest	704261.8	8624939	-12.4321	130.8791	reinstall	Monitoring PFAS plume extent off-Base

Note: Groundwater samples will be collected from monitoring wells using no purge methodology with HydraSleeves™ which will be installed within the screened interval, 1 metre below standing water level of each well a minimum of 24 hours prior to sampling.

Table 2 RAAF Base Darwin surface water monitoring locations

Location Code	On/Off Base	Location	Easting	Northing	Latitude	Longitude	Rationale/Description
SW104	Off-Base	Rapid Creek – Upstream of Weir	705089	8627606	-12.408	130.8866	Monitoring PFAS within Rapid Creek
SW106	Off-Base	Rapid Creek - Weir	704584	8627963	-12.4048	130.8819	Monitoring PFAS within Rapid Creek
SW108	Off-Base	Rapid Creek - Near Henry-Wrigley Drive	704144	8628317	-12.4016	130.8778	Monitoring PFAS within Rapid Creek
SW109	Off-Base	Rapid Creek - Near McMillan's Road	703587	8628927	-12.3961	130.8727	Monitoring PFAS within Rapid Creek
SW112	Off-Base	Rapid Creek - Pipe-track	702788	8630605	-12.381	130.8652	Monitoring PFAS within Rapid Creek
SW113	Off-Base	Rapid Creek - Fishing Platform	702326	8631150	-12.3761	130.8609	Monitoring PFAS within Rapid Creek
SW114	Off-Base	DIA drain to Rapid Creek - Near Dogs home	704995	8627526	-12.4087	130.8857	Monitoring PFAS contribution from DIA entering Rapid Creek
SW115	Off-Base	DIA drain to Rapid Creek	704644.3	8627637	-12.4077	130.8825	Monitoring PFAS contribution from DIA entering Rapid Creek
SW168	Off-Base	DIA drain to Rapid Creek - off Charles Eaton Dve	703865	8628388	-12.401	130.8753	Monitoring PFAS contribution from DIA entering Rapid Creek
SW120	Off-Base	Ludmilla Creek (Dick Ward Drive)	701051.6	8626476	-12.4185	130.8495	Monitoring PFAS within Ludmilla Creek
SW124	Off-Base	Ludmilla Creek (Boat Ramp)	699712.9	8627188	-12.4121	130.8372	Monitoring PFAS within Ludmilla Creek
SW125	Off-Base	Ludmilla Creek (Accessible Drain)	701522	8626133	-12.4215	130.8539	Monitoring PFAS discharging off-Base to Ludmilla Creek
SW132	Off-Base	Top of Reichardt Creek east arm	706204.2	8624362	-12.4372	130.897	Monitoring PFAS discharging to Reichardt Creek
SW133	Off-Base	Top of Reichardt Creek west arm	705026	8624335	-12.4376	130.8862	Monitoring PFAS discharging to Reichardt Creek
SW143	Off-Base	Drain to Sadgroves Creek	702406	8624854	-12.433	130.8621	Monitoring PFAS discharging to Sadgroves Creek
SW300	Off-Base	Off-Base – Located on Osgood Drive	703323.2	8628768.7	-12.3975	130.8702	Monitoring PFAS in surface water coming from sub-surface perched flow from CFTA
SW312	On-Base	Drainage from FFTA 1	706030.5	8625939.5	-12.4229	130.8953	Monitoring PFAS in surface water coming from FFTA 1
SW152	On-Base	Rapid Creek – Headwater south arm	706234	8626124	-12.4213	-12.4213	Monitoring PFAS within Rapid Creek
SW156	On-Base	On-Base – Current fire training ground	702904	8628401	-12.4009	130.8664	Monitoring surface water flow from the current fire training area

Location Code	On/Off Base	Location	Easting	Northing	Latitude	Longitude	Rationale/Description
SW160	On-Base	On-Base – stormwater pipe from Airside operations	702276	8626280	-12.4201	130.8608	Monitoring PFAS in on-Base stormwater pipe
SW162	On-Base	On-Base – southern boundary	703449	8625753	-12.4248	130.8716	Monitoring PFAS in stormwater leaving the Base to the south
SW170	On-Base	On Base - Eastern end of runway	706189	8626092	-12.4216	130.8968	Monitoring PFAS in surface water drains coming from key on-Base source areas
SW178	On-Base	On Base - Drain near Former Fuel Farm 5	705274.3	8626083	-12.4217	130.8884	Monitoring PFAS in surface water drains coming from key on-Base source areas
SW181	On-Base	On Base - Main drain to the north of Former Fuel Farms 4 & 6	704773.8	8626170	-12.421	130.8838	Monitoring PFAS in surface water drains coming from key on-Base source areas

Table -3 RAAF Base Darwin biota monitoring locations – downstream extent of the study reach

Location	Location Code	On/Off Base	Easting	Northing	Longitude	Latitude	Rationale/Description	Indicator/Target Species	Target sample numbers
Rapid Creek – (Freshwater) - Upstream of Trower Road	BIOFA024 or	Off-Base	704584	8627963	130.8819	-12.4048	Monitoring PFAS within Rapid Creek	Redclaw Crayfish	Minimum three of at least 100g
	BIOFA026 or	Off-Base	704144	8628315	130.8778	-12.4016			
	BIOFA028	Off-Base	702982	8629697	130.8692	-12.3899			
Ludmilla Creek (Estuarine area)	BIOFA016	Off-Base	701522	8626133	130.8539	-12.4215	Monitoring PFAS within Ludmilla Creek	Molluscs	Five composite samples of 10 molluscs
Rapid Creek mouth (Casuarina Drive)	BIOFA007	Off-Base	702326	8631150	130.8609	-12.3761	Monitoring PFAS within Rapid Creek	Fish	Three samples of each of 5 species of commonly consumed fish (15 total)
Ludmilla Creek Boat Ramp	BIOFA018	Off-Base	699783	8627150	130.8378	-12.4124	Monitoring PFAS within Ludmilla Creek	Fish	Three samples of each of 5 species of commonly consumed fish (15 total)

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Department of Defence
25-May-2021

Sampling Event Factual Report, November 2020 to January 2021

PFAS OMP - RAAF Base Darwin

Sampling Event Factual Report, November 2020 to January 2021

PFAS OMP - RAAF Base Darwin

Client: Department of Defence

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List of Tables (in Text)

Abbreviations

Term	Description
AECOM	AECOM Australia Pty Ltd
ALS	Australian Laboratory Services
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure, as amended (2013)
DCMM	Defence Contamination Management Manual
DIA	Darwin International Airport
DO	Dissolved oxygen
DoH	Department of Health
EC	Electrical conductivity
FSANZ	Food Standards Australia and New Zealand
HEPA	Heads of Environmental Protection Agencies
LOR	Limit of reporting
mAHD	metres Australian Height Datum
mbtoc	metres below top of casing
NATA	National Association of Testing Authorities
NEMP	National Environmental Management Plan
NEPC	National Environment Protection Council
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
NT	Northern Territory
NTU	Nephelometric Turbidity Unit
NSW	New South Wales
OMP	Ongoing Monitoring Program
ORP	Oxidation-reduction potential
PFAS	Per- and poly-fluoroalkyl substances
PFHxS	Perfluorohexane sulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance/Quality Control
QLD	Queensland
RAN	Royal Australian Navy
SAQP	Sampling Analysis Quality Plan
SWL	Standing Water Level

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Program (OMP) outlined in the *PFAS Management Area Plan (PMAP)* (Department of Defence, 2019a) at RAAF Base Darwin (the 'Site') in the Northern Territory. The location of the Site and Management Area is shown in **Figure 1** in **Appendix A**. The OMP (Defence, 2019a) for the Site outlines the requirement to complete annual biota sampling and biannual groundwater and surface water sampling.

A sampling event factual report is prepared following each sampling event. Annual interpretative reports will be prepared following the completion of each 12-month sampling period. This sampling event factual report has been prepared to report the results of the wet season sampling event completed across 2 to 8 November 2020, 2 to 4 December 2020, 16 to 18 December 2020 and 20 to 21 January 2021, specifically highlighting first time detections and/or first-time exceedances of human health screening criteria for Perfluorohexane sulfonic acid (PFHxS)+ Perfluorooctane sulfonate (PFOS) and / or Perfluorooctanoic acid (PFOA).

This report has been prepared in accordance with the *Defence PFAS OMP factual reports – interim guidance for preparation,* v0.2, March 2020 (Defence, 2020).

1.2 Objectives

The objective of the OMP is to provide information on changes to PFAS contamination originating from Defence property to inform risk management decisions by Defence and Territory agencies to protect human health and the environment.

Data on changes in distribution, concentration, transport (pathways and flow rates) and transformation of the contaminants and assessment against appropriate guideline values provides:

- An evidence base for targeted and effective risk management of PFAS contamination to protect human health and environmental receptors currently impacted by PFAS.
- An early warning that additional management of PFAS contamination may be warranted in areas not currently affected by PFAS.

2.0 Scope of Work

The sampling event was completed in general accordance with the SAQP (AECOM, 2019). In summary, the scope of works for this sampling event included:

- Obtaining permission to work in public spaces where some sampling locations are situated.
- Review of the SAQP prior to the monitoring event to ensure compliance with the following:
  - PFAS National Environmental Management Plan (NEMP) (2020)
  - National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013 (ASC NEPM, 2013)
  - Defence Routine Environment Water Quality Monitoring Manual
  - AS/NZ 5667:1998 Water quality – Sampling
  - Australian and New Zealand Guidelines for Fresh and Marine Water Quality; and
  - Relevant State regulatory guidelines.
- Collection of targeted aquatic biota (fish and aquatic invertebrate) samples in November 2020 from six locations using a combination of netting, trapping and hand collection (refer to **Table 1** below, and **Figure 1** in **Appendix A** for specific locations). Collection of six surface water samples nearby aquatic biota sample locations (refer to **Table 1** below, and **Figure 2** in **Appendix A** for specific locations)
- Collection of groundwater samples (including gauging of groundwater levels), in November 2020 from 30 existing monitoring wells using Hydrasleeves™ (refer to **Table 2** below, and **Figure 3** in **Appendix A** for specific locations). It is noted that one monitoring location could not be sampled during this sampling event; refer to **Table 8** for more details
- Collection of 21 surface water samples from 19 of the 22 planned sampling locations, in December 2020 and January 2021 (refer to **Table 3** below, and **Figure 2** in **Appendix A** for specific locations) during a first flush event for the Wet Season. Three locations were dry and surface water samples were therefore unable to be collected from those locations during this sampling event
- Collection of intra- and inter-laboratory duplicate samples at a rate of 1 in 10 primary samples, one rinsate and one field blank sample per fieldwork day for groundwater and surface water.
- Collection of composites (split) samples at a frequency of 1 in 10 primary samples for aquatic biota
- Analysis of samples for the following:
  - all samples for a suite of 28 PFAS analytes at the standard limit of reporting (LOR).
  - 20% of groundwater and surface water samples for major cations (sodium, calcium, magnesium and potassium) and anions (chlorine, sulphate, bicarbonate, carbonate), total suspended solids (TSS), dissolved organic carbon (DOC), pH and total dissolved solids (TDS).
- Data management of the OMP field and laboratory data in the Defence ESdat database
- Preparation of this Sampling Event Factual Report.

2.1 Planned Monitoring Locations

The monitoring locations outlined within the Sampling Analysis and Quality Plan (SAQP) for the planned biannual and annual groundwater, surface water and aquatic biota sampling events are outlined below:

Table 1 Aquatic Biota Sampling Locations and Target Species

Area	Description	Sampling Locations	Indicator/Target Capture	Number of Locations	Total
Off Site (Biota)	Rapid Creek – (Freshwater) - Upstream of Trower Road	Samples collected from BIOFA024, BIOFA26 and BIOFA028	Crustaceans	3	6 Locations
	Ludmilla Creek (Estuarine area)	BIOFA016	Molluscs	1	
	Rapid Creek mouth (Casuarina Drive)	BIOFA007	Diadromous or estuarine fish	1	
	Ludmilla Creek Boat Ramp)	BIOFA018	Diadromous or estuarine fish	1	
Off Site (Surface Water)	Rapid Creek	BIOFA007, BIOFA028, BIOFA026, BIOFA024	Water	4	6 Locations
	Ludmilla Creek	BIOFA018, BIOFA016	Water	2	

* The sample locations as presented in Figure 2 (Appendix A) are not the exact locations for collection of biota samples but rather the downstream extent of the study reach. The exact location extends over a couple hundred metres, but within the same habitat type as the locations identified on Figure 2 (Appendix A), based on target species appropriate habitat available on the day of sampling.

Table 2 Groundwater Sampling Locations

Area	Description	Sampling Locations	Number of wells/bores	Total
On Site	Former Fuel Farm 1	MW215	1	19 Locations
	Former Fuel Farm 5	MW297, MW112	2	
	Former Fuel Farms	MW303, MW133, MW205	3	
	Former Fire Training Area 1	MW422, MW139	2	
	Current Fire Training Area	MW240, MW241	2	
	Hangar 31	MW405*	1	
	RAAF Fire Station	MW103	1	
	Former ARFF Fire Station	MW115	1	
	Source area downgradient transect	MW107, MW128	2	
	Southern Boundary of site	MW141, MW144	2	
	Western boundary of site	MW148	1	

Area	Description	Sampling Locations	Number of wells/bores	Total
	Rapid Creek – eastern end	MW156	1	
Off Site	Former Fire training area 2, Darwin International Airport (DIA)	MW197	1	12 Locations
	Off-Base (north)	MW185	1	
	Rapid Creek	MW191, MW193, MW194, MW195	4	
	Off-Base (south)	MW176, MW180, MW200, MW211	4	
	Off-Base (south west)	MW209	1	
	Off-Base (west)	MW210	1	

*Location not sampled. Refer to Table 4 and Table 10 for further details

Table 3 Surface Water Sampling Locations

Area	Description	Sampling Locations	Number of Locations	Total
On Site	Surface water flow – current fire training ground	SW156*	1	7 Locations
	Stormwater pipe - Airside operations	SW160*	1	
	Stormwater– southern boundary	SW162	1	
	Surface water drain - Eastern end of runway	SW170	1	
	Surface water drain - near Former Fuel Farm 5	SW178	1	
	Surface water drain - north of Former Fuel Farms 4 & 6	SW181	1	
	Rapid Creek	SW101**	1	
Off Site	Rapid Creek	SW104, SW106, SW108, SW109, SW112, SW113	6	15 Locations
	DIA drain to Rapid Creek	SW114, SW115, SW168	3	
	Ludmilla Creek	SW120, SW124, SW125	3	
	Reichardt Creek	SW132, SW133	2	
	Drain to Sadgroves Creek	SW143	1	

*Location not sampled. Refer to Table 12 for further details

**First Flush Samples not attained due to inability to gain access during sampling event

2.2 Deviations from the SAQP

Some deviations from the SAQP exist. Outlined in **Table 4** below are the deviations from the SAQP (AECOM, 2019) during this sampling event.

Table 4 Deviations from the SAQP during sampling event for November 2020

SAQP	October 2020 Sampling Event
Seven surface water (on-base) locations are identified to be sampled as part of the start of wet-season (First-Flush) sampling event	Monitoring locations SW160 and SW156 were dry and were not sampled. Monitoring location SW101 was not sampled due to the inability to coordinate access to the location.
31 groundwater locations are identified to be sampled as part of the biannual sampling event	Monitoring location MW405 could not be sampled due to the location being impacted by AIR7000 development. A surveyor from Earl James & Associates (EJA: Surveying and Planning Services) was utilised to confirm the position of the well. The groundwater well could not be found and is assumed destroyed. Monitoring well MW133 was unable to be sampled due to damage to the standpipe and casing (bent PVC); however, its contingency location, MW292 was sampled instead.
The depth to groundwater will be measured in each monitoring well prior to collection of groundwater samples	Depth to groundwater was recorded from 29 of 32 wells visited. The following wells were not sampled and the depth to groundwater was not recorded: • MW405 is assumed to have been destroyed during construction works. • MW133 has been damaged and is no longer able to be gauged or sampled, however, its contingency location, MW292 was gauged instead. • During MW240 monitoring well visit the HydraSleeve™ fell into the well. The field team retrieved the sleeve without gaining a groundwater depth measurement.

3.0 Sampling Methodology

The methodology adopted for the annual biota sampling conducted in November 2020 and biannual groundwater surface water sampling event in December 2020 to January 2021 was in general accordance with the SAQP (noting that changes/deviations are captured in Section 2.2) and is summarised below:

Table 5 Sampling Methodology

Item	Details
Aquatic Biota Sampling	
Aquatic biota target samples	Target species for each identified sample location were based on those that are recognised as consumed by the public from the following three groups: • Diadromous or estuarine fish (Barramundi, Flathead, Javelin, Sweetlips, Mullet, Rock Cod, Queenfish, Jewfish, etc) • Molluscs (Longbums [*Telescopium Telescopium*] and Whelk) • Crustaceans (Redclaw Crayfish [*C.quadricarinatus.]*)
Aquatic biota sampling methodology	Sampling was conducted by Eco Logical Australia Pty Ltd and the Department of Fisheries (NT) between the 3 and 12 November 2020.

Item	Details
	Ethics approvals and Fisheries/Parks & Wildlife licences were obtained prior to biota sample collection. Estuarine fish were collected using 4-6-inch gill nets set three hours before low tide. Nets were continuously monitored from a small boat and cleared when movement was detected. Any non-target species were released immediately and where targeted biota species were identified, they were measured, weighed and euthanized humanely in accordance with the animal ethics permits conditions. Redclaw were captured using Opera House traps baited with raw beef (purchased from a supermarket). Traps were set overnight in freshwater pools and collected in the early morning. Longbums were hand-collected during low tide from the mangroves. Redclaw and Longbums were rinsed prior to being stored in snap-lock bags and euthanised by freezing. Samples were prepared for analysis at the Department of Fisheries laboratory prior to dispatching to the primary laboratory. This included the removal of scales/shell, head and internal organs. Fillets were taken with skin intact and homogenised prior to sub-sampling and analysis. Samples were prepared based on the following procedure: • For Target fish: - Used opened bag as board cover - Cleaned knife/blade with deionised water - For large fish the complete tissue samples of edible flesh was collected. For smaller fish, samples were provided whole with entrails removed. • For Redclaw Crayfish: - Rinsed in deionised water - Composited whole as 50-100g samples (about 3-5 individuals per sample). • For Longbum - Shells placed inside a sample bag and carefully smashed with a hammer, then tissue extracted with forceps - Tissue rinsed with deionised water - Composited 10 individuals as a sample • Samples were stored in snap-lock bags until preparation at NT Fisheries wet room laboratories • The weight, length, species and location caught were recorded.
Sample analysis	All whole, split and composite samples collected were tested for the extended suite of PFAS. Samples were submitted to the primary laboratory for analysis detailed in **Section 3.0**. ALS Environmental (ALS) Sydney, NSW was used as the primary laboratory. ALS methods for analyses were certified by the National Association of Testing Authorities (NATA). Laboratory certificates are presented in **Appendix E**.
QAQC samples	Field QA/QC samples collected included rinsate, split and composite samples which are described as the following: • Rinsate samples were taken from re-usable sample processing equipment (filleting knife) • Split samples were taken from fin fish (where minimum weight requirement for analysis is met).

Item	Details
	• Composite samples of aquatic biota (fin fish, crustacean or reptile (turtle) species) were taken where the minimum requirement for analysis was not met. Composite samples were taken from the same species and sample location for sample homogeneity. Refer to **Appendix C** for assessment of QA/QC sample data.
Groundwater and Surface Water Methodology	
Groundwater gauging	The depth to groundwater was measured in each monitoring well immediately prior to collection of groundwater samples using an interface probe.
Field parameters	Where appropriate, groundwater and surface water field parameters were recorded ex-situ and in-situ, respectively, using a YSI Pro Water Quality Meter. Parameters recorded consisted of the following: Temperature (°C), electrical conductivity (EC), dissolved oxygen (DO), oxidation-reduction potential (ORP) and pH. Observations of odour, colour and clarity (turbidity) of groundwater and surface water were recorded at each site.
Sampling methodology	Groundwater samples were collected from all accessible wells using no-purge methodology HydraSleeves™, which were installed within the screened interval of the wells for a minimum of 12 hours prior to the sampling round. This was based on a review of the well construction log. Once sampling was completed, new HydraSleeves™ were deployed at the screened interval depth in preparation for the next sampling round. Surface water samples were collected from approximately 0.1 metres below the water surface to minimise collection of sediment or floating materials in the samples. At each location, a new, laboratory supplied container was lowered into the water, using an aluminium sampling pole, with the cap immediately applied once the container was full.
QAQC samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits) and rinsate samples. Refer to **Appendix C** for assessment of QAQC sample data.
Sample analysis	Samples were submitted to the primary and secondary laboratories for analysis detailed in **Section 3.0**. ALS Environmental (ALS) Sydney, NSW was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for analyses were certified by the National Association of Testing Authorities (NATA). Laboratory certificates are presented in **Appendix E**

3.1 Adopted Screening Criteria

3.1.1 Aquatic Biota

Guidance documents used to assess the aquatic biota dataset includes the following:

- Department of Health (DoH), 2019. Health Based Guidance Values for PFAS for use in site investigations in Australia. April 2017 [updated September 2019]
- Heads of the Environment Protection Authority (HEPA), (2020), PFAS National Environmental Management Plan (NEMP). January 2020.
- National Health and Medical Research Council (NHMRC), 2019. Guidance on PFAS in Recreational Water. August 2019 (NHMRC 2019).
- National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013 (ASC NEPM).

The screening criteria which have been adopted for aquatic biota are presented in **Table 6** below and were selected for consistency with previous site investigation.

Table 6 Summary of Adopted Screening Criteria for Consumption of Aquatic Biota

Food classification	Compound	Criteria	Comment and Source
Crustaceans	PFOS and PFOS + PFHxS	65 µg/kg	Department of Health (2019) *Derivation: Children 2-6 years, median consumption* Occasionally consumed food. Trigger criteria for investigation for crustaceans apply to molluscs due to the small number of consumers of molluscs.
	PFOA	520 µg/kg	
Finfish	PFOS and PFOS + PFHxS	5.2 µg/kg	Department of Health (2019). *Derivation: Children 2-6 years, P90 consumption*
	PFOA	41 µg/kg	

3.1.2 Groundwater and Surface Water

Screening criteria were selected on the basis of national guidance in the form of the PFAS National Environmental Management Plan, Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset includes the following:

- Department of Health (DoH), 2019. Health Based Guidance Values for PFAS for use in site investigations in Australia. April 2017 [updated September 2019]
- Heads of the Environment Protection Authority (HEPA), (2020), PFAS National Environmental Management Plan (NEMP). January 2020.
- National Health and Medical Research Council (NHMRC), 2019. Guidance on PFAS in Recreational Water. August 2019 (NHMRC 2019).
- National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013 (ASC NEPM).

The adopted screening criteria which have been adopted for groundwater and surface water are presented **Table 6**.

Table 7 Summary of Adopted Screening Criteria for Groundwater and Surface Water

Pathway	Compound	Criteria	Comment/Reference
Human Health Receptors			
Drinking water - groundwater	PFOS + PFHxS	0.07 µg/L	These values are from the PFAS NEMP (HEPA, 2020). *All surface water and groundwater results will be compared to these criteria.*
	PFOA	0.56 µg/L	
Recreational use – surface water	PFOS + PFHxS	2 µg/L	These values are from NHMRC (2019). *All surface water results will be compared to these criteria.*
	PFOA	10 µg/L	

Pathway	Compound	Criteria	Comment/Reference
Human Health Receptors			
Ecological Receptors			
Freshwater (99% species protection values)	PFOS PFOA	0.00023 µg/L 19 µg/L	These values are from the PFAS NEMP (2020). The 99% level of protection has been applied for slightly to moderately disturbed ecosystems. This approach is generally adopted for chemicals that bioaccumulate and biomagnify in wildlife. For the purposes of preliminary screening of analytical water results, the laboratory LOR will be adopted rather than sole use of the criteria value. *All surface water and groundwater results will be compared to these criteria.*

3.2 Data Quality Objectives and Data Validation

The data quality objectives (DQOs) and data quality indicators (DQIs) adopted for these works are presented in the SAQP (AECOM, 2019).

Data validation assessment is provided in **Appendix C**.

Key findings from the data validation were as follows:

Groundwater

- The elevated RPDs for sum of PFHxs+PFOS and sum of PFAS should be taken into consideration when using the data quantitatively.
- The potential exists for the reported analyte concentrations to be biased high for PFHxS, PFPeS, PFPeA, PFBS, PFHpS, PFHxA. The elevated RPDs for these analytes should be taken into consideration when using the data quantitatively.
- Elevated RPDs for PFOA should be taken into consideration when concentrations are close to guidelines.

Surface Water

- Elevated RPDs should be taken into consideration when using data for PFOS quantitatively.
- The potential exists for concentrations of PFOS to be below the LOR, but above the guideline in all samples.
- Holding time exceedances should be taken into consideration when interpreting results for dissolved major cation quantitatively.

Biota

- The elevated RPD should be taken into account when using sum of PFAS results quantitatively for sample BIOAFA199.
- Potential exists for concentrations of PFPeA and MeFOSE to be under-reported by 31.2% and 20.5%, respectively. This should be taken into consideration when using results quantitatively.
- Potential over-reporting of MeFOSA will not affect the interpretation of the results, as all samples reported MeFOSA concentrations below the PQL.
- Potential exists for concentrations of MeFOSE to be under-reported by 32.3%. This should be taken into consideration when using MeFOSE results quantitatively.

Data validation procedures employed in the assessment of the field and laboratory QA/QC data are indicative that the overall quality of the analytical data produced is acceptably reliable for the purpose of this report. An examination of sampling analysis data compared to the data validation findings did not result in any results requiring flagging for potential inaccuracies.

All data collected during this event has been reviewed and uploaded to the Defence ESdat database in accordance with Defence Contamination Management Manual (DCMM) (Defence, 2018 as amended 2019) Annex L requirements.

4.0 Field Observations and Results

4.1 General Field Observations

The following field observations were applicable across the entirety of the sampling event.

Table 8 General Field Observations

Item	Observation
Weather conditions	Weather in general was observed to be partly cloudy, hot and humid during the sampling event. During the Biota sampling event 5.6 mm of rainfall was reported between 3 and 7 November 2020. (Darwin Airport weather station, 014015) (Bureau of Meteorology, 2020). 66.8 mm of rainfall was reported between 16 and 17 December at Darwin Airport. An additional 26.8 mm of rainfall was recorded on 15 December 2020 prior to sampling (Darwin Airport weather station, 014015) (Bureau of Meteorology, 2020). During the surface water event between 19 and 21 January a total of 18.6 mm of rainfall was reported. However, a total of 119 mm was observed the week leading up to the sampling event (Darwin Airport weather station, 014015) (Bureau of Meteorology, 2021).
Estate Management Works or Training Activities	During the sampling event, no notable estate works, or training activities were observed in the vicinity of sampling locations with the exception of the following: • Current AIR7000 construction activities. • Flight and bombing associated training activities were being undertaken. This did not interfere with the sampling program.

4.2 Biota

4.2.1 Field Observations

Table 9 Biota Observations

Item	Observation
Field Observations	Field observations were not provided by NT Fisheries field staff following the biota sampling event.
Access and Sample Collection	All monitoring locations were accessible and able to be sampled. Fish and invertebrate species collected and analysed included: • Ludmilla Creek (BIOFA018) - Pikey Bream (*Acanthopagrus pacificus*) - Blue Salmon (*Eleutheronema tetradactylum*) - Forktail Catfish 1 (*Neoarius sp.1*) - Forktail Catfish 2 (*Neoarius sp.2*) - Hawaiian Giant Herring (*Elops hawaiensis*) - Flathead (*Platycephalidae (family)*) - Archerfish (*Toxotes chatareus*) - Trevally (*Caranx sp.*) - Ponyfish (*Leiognathus equulus*) - Sea Mullet (*Mugil cephalus*) • Rapid Creek (BIOFA007): - Blue Salmon (*Eleutheronema tetradactylum*) - Ponyfish (Leiognathus equulus) - Milkfish (*Chanos chanos*) - Tarpon (*Megalops cyprinoides*) - Forktail Catfish (*Neoarius sp.1)* - Forktail Catfish (*Neoarius sp.2)* - Sea Mullet (*Mugil cephalus*) - Trevally (*Caranx sp.*) • Ludmilla Creek (BIOFA016) - Long Bum (*Telescopium telescopium*) - Giant Mangrove Whelk (*Terabralia palustris*) • Rapid Creek (BIOFA028, BIOFA026 and BIOFA024) - Redclaw Crayfish (*Cherux quadricarinatus*)

4.2.2 PFAS Biota Analytical Results

There were no new detections of PFAS or exceedances of adopted criteria present in the aquatic biota analytical results. The PFAS aquatic biota analytical results from this sampling event are presented in **Table T1** in **Appendix B**.

4.3 Groundwater

4.3.1 Field Observations and Field Measurements

Table 10 Groundwater Observations and Field Measurements

Item	Observations and Field Measurements
Fieldwork Dates	The groundwater sampling was completed between 2 and 4 November 2020. The results are summarised in the following sections (**Section 4.3.2** to **4.3.3**).
Access and Sample Collection	All monitoring wells and bores were accessible and able to be sampled with the exception of the following: Monitoring well MW405 was not sampled due to not being able to be located. A surveyor from EJA was utilised to confirm the position of the well. It is suspected that the monitoring well has been removed, damaged or decommissioned during earthworks during the ground disturbance works for the AIR7000 apron redevelopment project.
Monitoring Well Network Condition	The monitoring well network was generally in good condition and unchanged from the previous round with deviations noted in **Section 2.2**.
Field Observations	Monitoring wells MW303, MW292 and MW297 located near the fuel tank farm on Bombing Road were observed to emit a hydrocarbon odour.
Depth to Groundwater and flow direction	Depth to groundwater was recorded from 29 of 32 wells visited, ranging from 1.66 (MW209) to 11.97 (MW241) metres below top of casing (m btoc). Groundwater elevations in the aquifer were between 3.44 (MW185) and 24.10 (MW115) metres Australian Height Datum (m AHD). Groundwater gauging data is presented in **Table T2** in **Appendix B**. Inferred groundwater contours and groundwater flow directions at the Site in November 2020 are shown on **Figure 4** in **Appendix A**. A localised high point is located in the centre of the Base, south of the runway, with the groundwater flow radiating from this location. Groundwater in the north and west portions of the Base is inferred to generally flow north west towards the coast, with localised flow towards Ludmilla Creek on the western boundary of the Base and Rapid Creek north of the Base. Groundwater to the south of the site is inferred to flow towards Charles Darwin National Park and Francis Bay. Groundwater contours are generally consistent with the Detailed Site Investigation (Coffey, 2018) flow direction.
Geochemical Parameters	Groundwater geochemical parameters was measured during sample collection from the HydraSleeve™ using a sterilised YSI cup and YSI Pro Water Quality Meter. The readings are presented in **Table T2** in **Appendix B**, and are summarised below: • DO ranged from 0.2 mg/L (MW107) to 5.2 mg/L (MW180). • EC ranged from 36.7 µS/cm (MW112) to 1342 µS/cm (MW209) indicating a relatively low salinity. • pH ranged from 4.0 (MW128) to 6.2 (MW194) indicating slightly acidic conditions. • ORP (corrected) ranged from -47.6 mV (MW303) to 476.9 mV (MW240) indicating oxidising to reducing conditions.

4.3.2 PFAS Groundwater Analytical Results

During this sampling event, 29 of the 30 groundwater locations sampled reported concentrations of PFAS above the laboratory Limits of reporting (LOR). Monitoring locations MW103 reported a first-time exceedance of PFOA above the NEMP (2020) Drinking Water criteria and are presented in **Table 11** below.

Table 11 First Time Detections of PFAS and Exceedances of Guidelines in Groundwater

Type	Monitoring Well	Sum of PFHxS+PFOS concentration (µg/L)		PFOA concentration (µg/L)	
		November 2020	Previous Historical maximum	November 2020	Previous Historical maximum
First time detections of Sum of PFHxS+PFOS or PFOA in groundwater.	MW209	NA	NA	0.03	ND
First time exceedances of the Sum of PFHxS+PFOS or PFOA in groundwater.	MW103	NA	NA	0.79	0.31
	MW211	0.43	0.05	NA	NA

NA: Not applicable
ND: Non-detect

The PFAS groundwater analytical results from the November 2020 sampling event are presented in **Table T3** in **Appendix B** and spatially on **Figure 5** in **Appendix A.**

Table T4 in **Appendix B** presents historical PFAS groundwater analytical results.

4.3.3 Non-PFAS Groundwater Analytical Results

The non-PFAS groundwater analytical results from the November 2020 sampling event are presented in **Table T5** in **Appendix B**

4.4 Surface Water

4.4.1 Field Observations and Field Measurements

Table 12 Surface Water Observations and Field Measurements

Compound	Criteria
Fieldwork Dates	Surface water sampling was completed on 16 to 17 December 2020 and 20 January 2021. Earlier surface water sampling was conducted as part of the aquatic biota sampling event between 3 and 7 November 2020. The results for each of these events are summarised in the following sections.

Compound	Criteria
Access and Sample Collection	All surface water sampling locations were accessible or able to be sampled with the exception of the following: • The surface water sample from SW101 was not collected. This is because to the contracted works safety officer not willing to proceed with field staff due to historical vehicle bogging. Field staff on the day were uncertain about proceeding on foot, without the accompaniment of a WSO. Since the last sampling dates, AECOM have not been able to organise with Defence a time to revisit the location to sample. • Surface water sample SW156 was not collected as the location had insufficient water run-off to collect the sample. • Surface water location SW160 was not collected due to the location being too dry to sample.
Contamination Observations	No obvious visible signs of contamination were observed.
Surface Water Flow	Increased rain events across the Darwin region during the sampling event resulted in increased flows for all surface water sampling locations. However, sampling location SW156 has active flow only for a short period during a downpour event.
Geochemical Parameters	Surface water geochemical parameters were measured prior to collecting surface water samples in December 2020. The stabilised readings are presented in **Table T6** in **Appendix B**, and are summarised below: • Dissolved oxygen ranged from 2.5 mg/L (SW112) to 5.7 mg/L (SW124) indicating relatively poorly oxygenated to well oxygenated conditions. • Electrical conductivity ranged. from 19.5 µS/cm (SW115) to 44573.0 µS/cm (SW124) indicating fresh to highly saline conditions. • pH ranged from 6.4 (SW168) to 9.6 (SW133) indicating slightly acidic to slightly alkaline conditions. • Redox (corrected) ranged from 293.4 mV (SW133) to 390.1 mV (SW113) indicating oxidising conditions.

4.4.2 PFAS Surface Water Analytical Results

The PFAS surface water analytical results from the November 2020 aquatic biota sampling event and the December 2020 and January 2021 first flush sampling events are presented in **Table T7** in **Appendix B**. There were no first-time detections above the limit of reporting or screening criteria in the dataset. **Table T8** in **Appendix B** presents historical PFAS surface water analytical results.

Deviations from the historical dataset are recorded in **Table 13** below.

Table 13 First Time Detections of PFAS and Exceedances of Guidelines in Surface Water

Type	Location ID	Sum of PFHxS+PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFOS concentration (µg/L)	
		November 2020	Historical maximum	November 2020	Historical maximum	November 2020	Historical maximum
First time detections of Sum of PFHxS+PFOS, PFOS or PFOA in surface water.	There were no first-time detections of PFHxS+PFOS, PFOS or PFOA during this sampling event.						

Type	Location ID	Sum of PFHxS+PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFOS concentration (µg/L)	
		November 2020	Historical maximum	November 2020	Historical maximum	November 2020	Historical maximum
First time exceedance of Sum of PFHxS+PFOS, PFOS or PFOA in surface water.	There were no first-time exceedances of PFHxS+PFOS, PFOS or PFOA during this sampling event, when applied to the following guidance criteria: PFAS NEMP (2020) Freshwater 99% Species Protection, PFAS NEMP (2020) Human Health Drinking Water and NHMRC (2019) PFAS Recreational Water.						

4.4.3 Non-PFAS Surface Water Analytical Results

The non-PFAS surface water analytical results from the December 2020 sampling events are presented in **Table T9** in **Appendix B.**

5.0 Summary and Next Sampling Events

5.1 Summary of Monitoring Event

The annual and bi-annual monitoring event was completed at the Site and publicly accessible land within the Management Area between 3 and 12 November 2020, 16 and 18 December 2020 and 20 and 21 January 2021. The program included sampling of:

- biota from six sample locations, and surface water sampling at six surface water locations in proximity to the aquatic biota sampling locations.
- Groundwater sampled from 30 of a planned 31 monitoring wells, it is noted that 32 monitoring wells were visited as one well was damaged and unable to be sampled.
- surface water sampling at 19 of a planned 22 locations.

The findings of the November and December 2020 and January 2021 sampling events and the recommended actions are summarised in **Table 14** below.

Table 14 Summary of Sampling Event

Item	Comment	Recommended Actions
Access to sampling locations	The following were accessed and able to be sampled: • 6 out of 6 biota locations, and associated surface water locations (6 out of 6). • 30 out of 31 monitoring wells • 19 out of 22 surface water locations Groundwater monitoring wells MW133 was not sampled due to damage to the standpipe and casing (at ground level). Monitoring well MW405 could not be located. A surveyor from Earl James & Associates (EJA: Surveying and Planning Services) was engaged during the sampling event to confirm the wells' location. It is suspected that the AIR7000 project development, and incorporated earthworks have destroyed the monitoring well. The surface water sample SW160 was not collected as the location was dry during both December and January sampling events. During these events, SW156 had insufficient run-off to gain a sample. SW101 was not accessed due to escorting constraints.	No actions recommended.
Monitoring well network condition	Monitoring well MW133 remains damaged. Given that sufficient coverage will be provided by monitoring wells MW292 (contingency location) and MW303 it is not anticipated that this will affect the continued implementation of the OMP.	AECOM to engage a licensed driller to assess the status of the monitoring well
Analytical Results	PFAS concentrations were recorded above the LOR at 30 of 31 monitoring wells, all 19 surface	No actions recommended.

Item	Comment	Recommended Actions
	water locations sampled, and all 6 of 6 biota locations sampled.	
First time exceedance of NEMP drinking water guideline values in groundwater	Monitoring location MW103 exceeded adopted screening criteria for the first time for PFOA. Monitoring location MW211 exceeded adopted screening criteria for the first time for sum of PFHxS+PFOS.	Ongoing monitoring in accordance with the OMP.
First time detection of PFAS in groundwater	Monitoring location MW209 had a detection of PFOA for the first time since testing began in 2017.	Ongoing monitoring in accordance with the OMP.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show an increasing trend in groundwater and surface water [1]	This will be evaluated in the annual interpretive report.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show a decreasing trend in groundwater and surface water [2]	This will be evaluated in the annual interpretive report.	No actions recommended.

5.2 Upcoming Sampling Events

The next biannual sampling event is scheduled for April 2021.

5.3 Upcoming Annual Interpretive Report

The first annual interpretive report is scheduled to be delivered in June 2021.

[1] Statistically significant increasing trend over two years of monitoring or increase by >30% in one year
[2] Statistically significant decreasing trend over two years of monitoring or decrease by >30% in one year

6.0 References

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Appendix A

Figures

Appendix A Figures

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.5 1 2

Kilometers

1:45,000 (when printed at A3)

Legend

- Drainage
- Highway
- Management Area
- RAAF Base Darwin
- Source Area

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
RAAF BASE DARWIN
FACTUAL REPORT 2020/21

Site and Management Area

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	KAI.DU 19 FEB 2021
VERSION:	1

Figure 01

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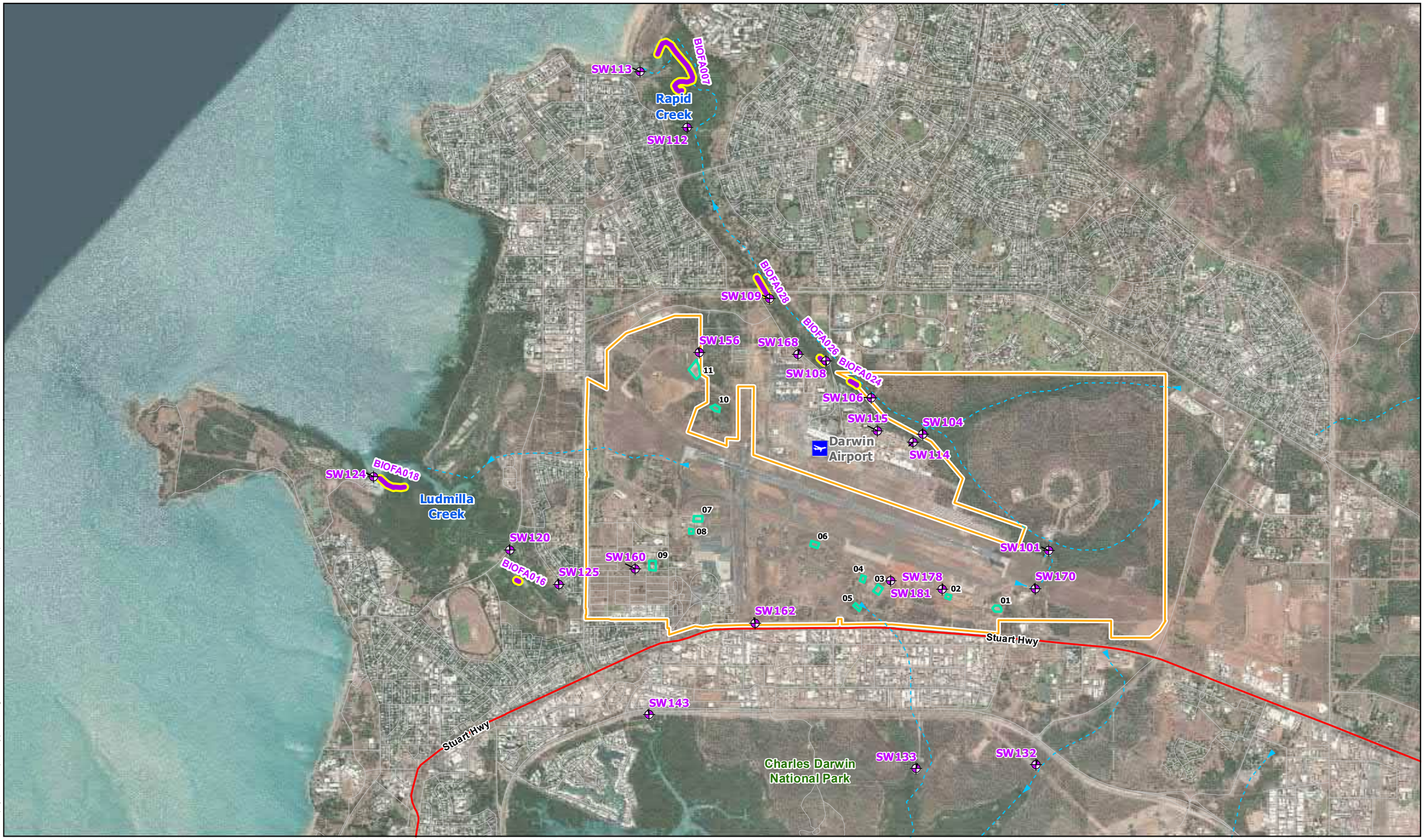

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DATUM GDA 1994, PROJECTION MGA ZONE 52

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Kilometers

1:35,000 (when printed at A3)

Legend

- Surface Water Locations
- Biota Sampling Location
- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
RAAF BASE DARWIN
FACTUAL REPORT 2020/21

Surface Water and Biota Locations

PROJECT ID 60612561
CREATED BY KD
LAST MODIFIED KAI.DU 19 FEB 2021
VERSION: 1

Figure 02

A3 size

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.2 0.4 0.8

Kilometers

1:20,000 (when printed at A3)

Legend

- Groundwater Monitoring Locations
- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
RAAF BASE DARWIN
FACTUAL REPORT 2020/21

Groundwater Sampling Locations

PROJECT ID 60612561
CREATED BY KD
LAST MODIFIED KAI.DU 19 FEB 2021
VERSION: 1

Figure 03

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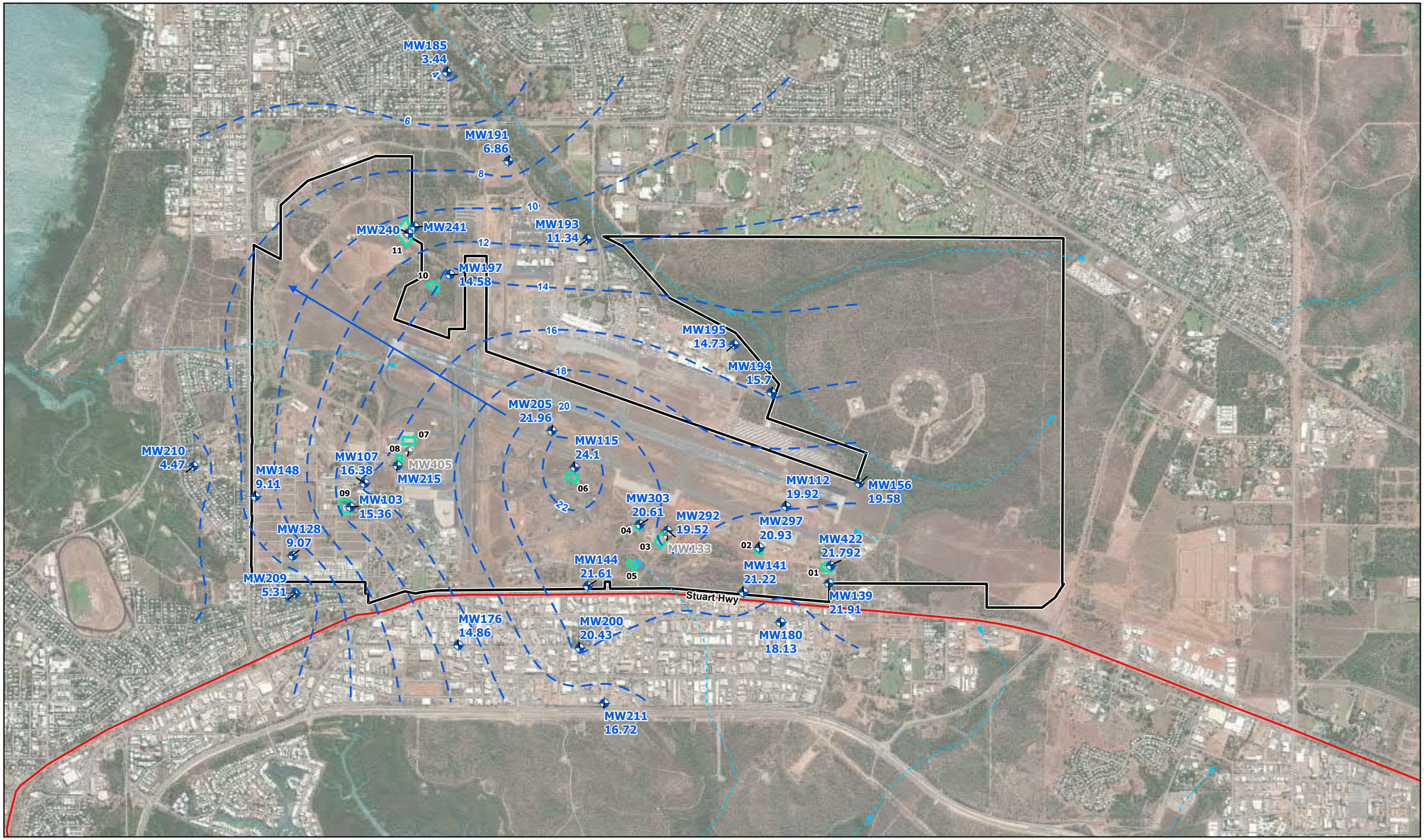
A3 size



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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.3 0.6 1.2
Kilometers

1:25,000 (when printed at A3)

Legend

- Groundwater Monitoring Locations
- Monitoring Locations (Day/Damaged/Inaccessible)
- 175.44 Inferred Groundwater Level
- Groundwater Flow Direction
- Inferred Groundwater Level
- Drainage
- Highway
- Road
- Source Area
- RAAF Base Darwin

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
RAAF BASE DARWIN
FACTUAL REPORT 2020/21

Inferred Groundwater Contours

PROJECT ID 60612561
CREATED BY KAI.DU
LAST MODIFIED KAI.DU19 FEB 2021
VERSION: 1

Figure
04

Filename: \\AUDWN1FP001\Projects\606x\60612561\900_CAD_GIS\920_GIS\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2020\Factual_Report_Figure_2020\Factual_Report_Figure_2020\Factual_Report_Figure_2020.aprx

A3 size

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.25 0.5 1
Kilometers

1:21,000 (when printed at A3)

Legend

- Groundwater Monitoring Locations
- Monitoring Locations (Day/Damaged/Inaccessible)

Exceedance

- Denotes First Time Detection above LOR for Sum of PFHxS+PFOS or PFOA
- Denotes New Exceedance of Human Health Screening Criteria

- Drainage
- Highway
- Road
- RAAF Base Darwin

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
RAAF BASE DARWIN
FACTUAL REPORT
November - January 2020
Groundwater Results
Deviations from Historical Data

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	James.Guzman04 May 2021
VERSION:	1

Figure
05

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A3 size

Appendix B

Tables

Appendix B Tables

Table T1
Biota PFAS Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

											PFAS Full Suite																
Location Code	**Field ID**	**Sample Type**	**Sampled Date**	**Fauna group**	**Species**	**No. of Specimen**	**Length Range (mm)**	**Total Weight (g)**	**Dissected Sample Weight (g)**	**Sample Portion**	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	**4:2 Fluorotelomer sulfonic acid (4:2 FTS)**	**6:2 Fluorotelomer Sulfonate (6:2 FtS)**	**8:2 Fluorotelomer sulfonic acid (8:2 FTS)**	**N-Ethyl perfluorooctane sulfonamide (EtFOSA)**	**N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)**	**N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)**	**N-Methyl perfluorooctane sulfonamide (MeFOSA)**	**N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)**	**N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)**	**Perfluorobutane sulfonic acid (PFBS)**	**Perfluorobutanoic acid (PFBA)**	**Perfluorodecanesulfonic acid (PFDS)**	**Perfluorodecanoic acid (PFDA)**	**Perfluorododecanoic acid (PFDoDA)**	**Perfluoroheptane sulfonic acid (PFHpS)**	**Perfluoroheptanoic acid (PFHpA)**
											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	mg/kg
										PQL	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.005	0.001	0.002	0.001	0.005	0.002	0.001	0.002	0.001	0.001
FSANZ 2017 2-6 years Crustaceans (all species)																											
FSANZ 2017 2-6 years Finfish (all)																											
BIOFA018	1302_BIOAFA154_201103	Primary	3/11/2020	Fish	Pikey Bream (Acanthopagrus pacificus)	1	330	617	82	left fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_QC122_201103	Composite	3/11/2020	Fish	Pikey Bream (Acanthopagrus pacificus)	1	330	617	63	right fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA155_201103	Primary	3/11/2020	Fish	Blue Salmon (Eleutheronema tetradactylum)	1	410	540	73	left fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_QC123_201103	Composite	3/11/2020	Fish	Blue Salmon (Eleutheronema tetradactylum)	1	410	540	71	right fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA156_201103	Primary	3/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	380	448	45	left fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA157_201103	Primary	3/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	1	340	399	64	left fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA158_201103	Primary	3/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	1	330	347	49	left fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA159_201103	Primary	3/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	1	320	283	49	left fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA160_201103	Primary	3/11/2020	Fish	Hawaiian Giant Herring (Elops hawaiensis)	1	390	370	75	left fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA161_201103	Primary	3/11/2020	Fish	Flathead (Platycephalidae (family))	1	290	145	78	whole minus guts, head and tail	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA162_201103	Primary	3/11/2020	Fish	Archerfish (Toxotes chatareus)	1	220	165	102	whole minus guts, head and tail	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA164_201103	Primary	3/11/2020	Fish	Trevally (Caranx sp.)	1	230	186	109	whole minus guts, head and tail	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA165_201103	Primary	3/11/2020	Fish	Trevally (Caranx sp.)	1	230	201	128	whole minus guts, head and tail	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA166_201103	Primary	3/11/2020	Fish	Trevally (Caranx sp.)	1	230	174	103	whole minus guts, head and tail	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA167_201103	Primary	3/11/2020	Fish	Ponyfish (Leiognathus equulus)	1	190	107	61	whole minus guts, head and tail	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA168_201103	Primary	3/11/2020	Fish	Ponyfish (Leiognathus equulus)	1	190	123	57	whole minus guts, head and tail	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA170_201103	Primary	3/11/2020	Fish	Sea Mullet (Mugil cephalus)	3	150-170	156	101	whole with guts removed	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA171_201103	Primary	3/11/2020	Fish	Sea Mullet (Mugil cephalus)	3	160-170	189	122	whole with guts removed	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA172_201103	Primary	3/11/2020	Fish	Sea Mullet (Mugil cephalus)	3	150-170	137	86	whole with guts removed	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
BIOFA016	1302_BIOAFA173_201103	Primary	3/11/2020	Invertebrate	Long Bum (Telescopium telescopium)	10	75-85	451	62	shell removed	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA174_201103	Primary	3/11/2020	Invertebrate	Long Bum (Telescopium telescopium)	10	75-85	420	74	shell removed	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA175_201103	Primary	3/11/2020	Invertebrate	Long Bum (Telescopium telescopium)	10	80-100	524	77	shell removed	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA176_201103	Primary	3/11/2020	Invertebrate	Giant Mangrove Whelk (Terebralia palustris)	10	100-110	614	107	shell removed	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA177_201103	Primary	3/11/2020	Invertebrate	Giant Mangrove Whelk (Terebralia palustris)	10	90-100	565	104	shell removed	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
BIOFA007	1302_BIOAFA178_201104	Primary	4/11/2020	Fish	Blue Salmon (Eleutheronema tetradactylum)	1	530	1427	104	left fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_QC126_201104	Composite	4/11/2020	Fish	Blue Salmon (Eleutheronema tetradactylum)	1	530	1427	104	right fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA179_201104	Primary	4/11/2020	Fish	Tarpon (Megalops cyprinoides)	1	410	566	78	left fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA180_201104	Primary	4/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	450	1016	96	left fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_QC128_201104	Composite	4/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	450	1016	75	right fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA181_201104	Primary	4/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	445	994	85	left fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_QC129_201104	Composite	4/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	445	994	83	right fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA182_201104	Primary	4/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	420	688	69	left fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA183_201104	Primary	4/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	1	360	446	100	left and right fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA184_201104	Primary	4/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	1	340	370	96	left and right fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA186_201104	Primary	4/11/2020	Fish	Milkfish (Chanos chanos)	1	380	592	127	left fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA187_201104	Primary	4/11/2020	Fish	Milkfish (Chanos chanos)	1	410	586	119	left fillet	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA189_201104	Primary	4/11/2020	Fish	Trevally (Caranx sp.)	1	280	257	147	whole minus guts, head and tail	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA190_201104	Primary	4/11/2020	Fish	Trevally (Caranx sp.)	1	240	180	100	whole minus guts, head and tail	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA191_201104	Primary	4/11/2020	Fish	Trevally (Caranx sp.)	1	240	186	100	whole minus guts, head and tail	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA192_201104	Primary	4/11/2020	Fish	Ponyfish (Leiognathus equulus)	1	180	105	60	whole minus guts, head and tail	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA193_201104	Primary	4/11/2020	Fish	Sea Mullet (Mugil cephalus)	1	210	103	66	whole minus guts, head and tail	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA194_201104	Primary	4/11/2020	Fish	Sea Mullet (Mugil cephalus)	2	160-200	120	79	whole minus guts, head and tail	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA195_201104	Primary	4/11/2020	Fish	Sea Mullet (Mugil cephalus)	2	150-200	123	73	whole minus guts, head and tail	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
BIOFA028	1302_BIOAFA196_201107	Primary	7/11/2020	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	1	75	103	103	whole fish	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA197_201107	Primary	7/11/2020	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	3	50-70	140	140	whole fish	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
BIOFA026	1302_BIOAFA199_201108	Primary	8/11/2020	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	1	55	35	35	whole fish	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
BIOFA024	1302_BIOAFA201_201112	Primary	12/11/2020	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	1.5	60-75	108	108	whole fish	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001
	1302_BIOAFA202_201112	Primary	12/11/2020	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	2	50-60	76	76	whole fish	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001

Notes:
PQL: Practical Quantitation Limits
mg/kg: milligrams per kilogram
(mm): millimetres
(g): grams

Table T1
Biota PFAS Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

AECOM

											PFAS Full Suite													
											Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (FOSA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	PFOS - Linear	Sum of PFAS	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorohexane sulfonic acid (PFHxS)
											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
										PQL	0.001	0.001	0.005	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
FSANZ 2017 2-6 years Crustaceans (all species)																					**0.065**	**0.52**	**0.065**
FSANZ 2017 2-6 years Finfish (all)																					**0.005**	**0.041**	**0.005**
Location Code	**Field ID**	**Sample Type**	**Sampled Date**	**Fauna group**	**Species**	**No. of Specimen**	**Length Range (mm)**	**Total Weight (g)**	**Dissected Sample Weight (g)**	**Sample Portion**													
BIOFA018	1302_BIOAFA154_201103	Primary	3/11/2020	Fish	Pikey Bream (Acanthopagrus pacificus)	1	330	617	82	left fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_QC122_201103	Composite	3/11/2020	Fish	Pikey Bream (Acanthopagrus pacificus)	1	330	617	63	right fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA155_201103	Primary	3/11/2020	Fish	Blue Salmon (Eleutheronema tetradactylum)	1	410	540	73	left fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_QC123_201103	Composite	3/11/2020	Fish	Blue Salmon (Eleutheronema tetradactylum)	1	410	540	71	right fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA156_201103	Primary	3/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	380	448	45	left fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.003	0.004	0.001	<0.001	<0.001
	1302_BIOAFA157_201103	Primary	3/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	1	340	399	64	left fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.003	0.004	0.001	<0.001	<0.001
	1302_BIOAFA158_201103	Primary	3/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	1	330	347	49	left fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.005	0.005	<0.001	<0.001	<0.001
	1302_BIOAFA159_201103	Primary	3/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	1	320	283	49	left fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA160_201103	Primary	3/11/2020	Fish	Hawaiian Giant Herring (Elops hawaiensis)	1	390	370	75	left fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA161_201103	Primary	3/11/2020	Fish	Flathead (Platycephalidae (family))	1	290	145	78	whole minus guts, head and tail	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	<0.001	<0.001	<0.001
	1302_BIOAFA162_201103	Primary	3/11/2020	Fish	Archerfish (Toxotes chatareus)	1	220	165	102	whole minus guts, head and tail	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA164_201103	Primary	3/11/2020	Fish	Trevally (Caranx sp.)	1	230	186	109	whole minus guts, head and tail	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	<0.001	<0.001	<0.001
	1302_BIOAFA165_201103	Primary	3/11/2020	Fish	Trevally (Caranx sp.)	1	230	201	128	whole minus guts, head and tail	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.003	0.003	<0.001	<0.001	<0.001
	1302_BIOAFA166_201103	Primary	3/11/2020	Fish	Trevally (Caranx sp.)	1	230	174	103	whole minus guts, head and tail	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA167_201103	Primary	3/11/2020	Fish	Ponyfish (Leiognathus equulus)	1	190	107	61	whole minus guts, head and tail	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.007	0.008	0.001	<0.001	<0.001
	1302_BIOAFA168_201103	Primary	3/11/2020	Fish	Ponyfish (Leiognathus equulus)	1	190	123	57	whole minus guts, head and tail	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	<0.001	<0.001	<0.001
	1302_BIOAFA170_201103	Primary	3/11/2020	Fish	Sea Mullet (Mugil cephalus)	3	150-170	156	101	whole with guts removed	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA171_201103	Primary	3/11/2020	Fish	Sea Mullet (Mugil cephalus)	3	160-170	189	122	whole with guts removed	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	<0.001	<0.001	<0.001
	1302_BIOAFA172_201103	Primary	3/11/2020	Fish	Sea Mullet (Mugil cephalus)	3	150-170	137	86	whole with guts removed	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
BIOFA016	1302_BIOAFA173_201103	Primary	3/11/2020	Invertebrate	Long Bum (Telescopium telescopium)	10	75-85	451	62	shell removed	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.025	0.036	0.002	0.007	0.002
	1302_BIOAFA174_201103	Primary	3/11/2020	Invertebrate	Long Bum (Telescopium telescopium)	10	75-85	420	74	shell removed	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.028	0.04	0.002	0.008	0.002
	1302_BIOAFA175_201103	Primary	3/11/2020	Invertebrate	Long Bum (Telescopium telescopium)	10	80-100	524	77	shell removed	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.013	0.021	0.001	0.006	0.001
	1302_BIOAFA176_201103	Primary	3/11/2020	Invertebrate	Giant Mangrove Whelk (Terebralia palustris)	10	100-110	614	107	shell removed	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.005	0.006	0.001	<0.001	<0.001
	1302_BIOAFA177_201103	Primary	3/11/2020	Invertebrate	Giant Mangrove Whelk (Terebralia palustris)	10	90-100	565	104	shell removed	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.006	0.006	<0.001	<0.001	<0.001
BIOFA007	1302_BIOAFA178_201104	Primary	4/11/2020	Fish	Blue Salmon (Eleutheronema tetradactylum)	1	530	1427	104	left fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	<0.001	<0.001	<0.001
	1302_QC126_201104	Composite	4/11/2020	Fish	Blue Salmon (Eleutheronema tetradactylum)	1	530	1427	104	right fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	<0.001	<0.001	<0.001
	1302_BIOAFA179_201104	Primary	4/11/2020	Fish	Tarpon (Megalops cyprinoides)	1	410	566	78	left fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA180_201104	Primary	4/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	450	1016	96	left fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	<0.001	<0.001	<0.001
	1302_QC128_201104	Composite	4/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	450	1016	75	right fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.002	0.001	<0.001	<0.001
	1302_BIOAFA181_201104	Primary	4/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	445	994	85	left fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.005	0.009	0.002	<0.001	0.002
	1302_QC129_201104	Composite	4/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	445	994	83	right fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.003	0.001	<0.001	<0.001
	1302_BIOAFA182_201104	Primary	4/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	420	688	69	left fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.003	0.003	<0.001	<0.001	<0.001
	1302_BIOAFA183_201104	Primary	4/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	1	360	446	100	left and right fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.008	0.009	0.001	<0.001	<0.001
	1302_BIOAFA184_201104	Primary	4/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	1	340	370	96	left and right fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.005	0.001	<0.001	<0.001
	1302_BIOAFA186_201104	Primary	4/11/2020	Fish	Milkfish (Chanos chanos)	1	380	592	127	left fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA187_201104	Primary	4/11/2020	Fish	Milkfish (Chanos chanos)	1	410	586	119	left fillet	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA189_201104	Primary	4/11/2020	Fish	Trevally (Caranx sp.)	1	280	257	147	whole minus guts, head and tail	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.014	0.015	0.001	<0.001	<0.001
	1302_BIOAFA190_201104	Primary	4/11/2020	Fish	Trevally (Caranx sp.)	1	240	180	100	whole minus guts, head and tail	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.017	0.019	0.002	<0.001	<0.001
	1302_BIOAFA191_201104	Primary	4/11/2020	Fish	Trevally (Caranx sp.)	1	240	186	100	whole minus guts, head and tail	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.007	0.007	<0.001	<0.001	<0.001
	1302_BIOAFA192_201104	Primary	4/11/2020	Fish	Ponyfish (Leiognathus equulus)	1	180	105	60	whole minus guts, head and tail	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.004	<0.001	<0.001	<0.001
	1302_BIOAFA193_201104	Primary	4/11/2020	Fish	Sea Mullet (Mugil cephalus)	1	210	103	66	whole minus guts, head and tail	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA194_201104	Primary	4/11/2020	Fish	Sea Mullet (Mugil cephalus)	2	160-200	120	79	whole minus guts, head and tail	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA195_201104	Primary	4/11/2020	Fish	Sea Mullet (Mugil cephalus)	2	150-200	123	73	whole minus guts, head and tail	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.008	0.004	<0.001	<0.001
BIOFA028	1302_BIOAFA196_201107	Primary	7/11/2020	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	1	75	103	103	whole fish	<0.001	<0.001	<0.005	0.001	<0.002	<0.002	<0.002	<0.001	0.012	0.024	0.003	<0.001	0.008
	1302_BIOAFA197_201107	Primary	7/11/2020	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	3	50-70	140	140	whole fish	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.012	0.002	<0.001	0.006
BIOFA026	1302_BIOAFA199_201108	Primary	8/11/2020	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	1	55	35	35	whole fish	0.002	<0.001	<0.005	0.002	<0.002	<0.002	<0.002	<0.001	0.003	0.016	0.001	<0.001	0.008
BIOFA024	1302_BIOAFA201_201112	Primary	12/11/2020	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	1.5	60-75	108	108	whole fish	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.003	0.006	0.001	<0.001	0.002
	1302_BIOAFA202_201112	Primary	12/11/2020	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	2	50-60	76	76	whole fish	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.005	<0.001	<0.001	0.002

Notes:
PQL: Practical Quantitation Limits
mg/kg: milligrams per kilogram
(mm): millimetres
(g): grams

Table T2
Field and Gauging Results
PFAS Ongoing Monitoring Program
Department of Defence- RAAF Darwin

AECOM

Location ID	Screening Interval (m bgl)	Hydrasleeve Deployment Collar Depth (mbgl)	Sampled Date	Depth to Water (mbtoc)	Well Depth (mbtoc)	Water Elevation (mAHD)	TOC (mAHD)	Condition of Gatic	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Redox (mV)	Redox (corr) (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method/Comments
MW103	1-15	11	2/11/2020	4.19	10.47	15.36	19.55	Good	0.8	179.3	116.5	5.6	47.9	247.9	31.4	Medium	Light Brown	Odourless	No sheen	Hydrasleeve
MW107	1-15	14	2/11/2020	5.56	13.40	16.38	21.94	Good	0.2	197.2	128.2	5.6	-1.5	198.5	31	Turbid	Brown	Slightly Organic	No sheen	Hydrasleeve
MW112	1-15	Not available	3/11/2020	7.05	12.34	19.92	26.97	Good	1.9	36.7	23.9	4.6	261.5	461.5	31.3	Medium	Colourless	Odourless	No sheen	Hydrasleeve
MW115	1-15	13.55	3/11/2020	8.31	13.20	24.10	32.41	Good	1.0	53.5	34.8	4.7	229.5	429.5	30.6	Low	Colourless	Odourless	No sheen	Hydrasleeve
MW128	1-15	13.5	3/11/2020	2.32	12.51	9.07	11.39	Good	1.0	66.5	43.2	4.0	267.2	467.2	31.5	Low	Light Brown	Odourless	No sheen	Hydrasleeve
MW139	1-15	13	2/11/2020	6.64	13.58	21.91	28.55	Good	1.2	40.8	26.5	4.5	276.6	476.6	31.7	Medium	Grey / Brown	Odourless	No sheen	Hydrasleeve
MW141	1-16	14.5	2/11/2020	8.88	14.24	21.22	30.10	Good	3.6	60.3	39.2	5.3	177.8	377.8	30.4	Low	Light Grey	Odourless	No sheen	Hydrasleeve
MW144	1-15	13.5	3/11/2020	9.08	14.06	21.61	30.69	Good	1.5	51.4	33.4	4.5	248.2	448.2	31.5	Low	Light Grey	Slightly Organic	No sheen	Hydrasleeve
MW148	1-12	11.3	3/11/2020	3.05	11.48	9.11	12.16	Good	1.8	79.2	51.5	5.0	148.5	348.5	31.7	Low	Colourless	Odourless	No sheen	Hydrasleeve
MW156	1-15	Not available	3/11/2020	3.47	11.50	19.58	23.04	Good	1.7	78.2	50.8	5.2	110.2	310.2	29.8	Low	White	Odourless	No sheen	Hydrasleeve
MW176	1-12	Not available	4/11/2020	3.88	9.04	-	-	Good	0.5	65.3	42.4	5.4	232.4	432.4	31.5	Turbid	Red/Brown	Odourless	No sheen	Hydrasleeve
MW180	1-15	13.5	2/11/2020	10.93	12.99	18.13	29.06	Good	5.2	76.5	49.7	4.9	240.3	440.3	33.4	Low	Grey / Brown	Odourless	No sheen	Hydrasleeve
MW185	1-12	10.5	2/11/2020	2.38	10.65	-	-	Good	1.7	759	493.4	5.6	122.2	322.2	31.4	Turbid	Brown	Odourless	No sheen	Hydrasleeve
MW191	1-12	Not available	3/11/2020	4.05	10.89	6.86	10.91	Good	2.3	62.8	40.8	5.4	190.9	390.9	31.6	Turbid	Light Brown	Odourless	No sheen	Hydrasleeve
MW193	1-12	Not available	2/11/2020	1.80	10.58	11.34	13.14	Good	2.9	90.1	58.6	5.1	152	352	32.4	Turbid	Brown	Odourless	No sheen	Hydrasleeve
MW194	1-12	Not available	2/11/2020	2.54	11.65	15.70	18.24	Good	3.9	88.9	57.8	6.2	102.5	302.5	31.4	Low	Grey / Brown	Slightly Organic	No sheen	Hydrasleeve
MW195	1-12	Not available	2/11/2020	2.01	10.68	14.73	16.74	Good	2.2	80.7	52.5	4.8	198.5	398.5	31.8	Medium	Yellow / Brown	Odourless	No sheen	Hydrasleeve
MW197	1-15	Not available	3/11/2020	11.61	14.11	14.58	26.20	Good	1.0	121.1	78.7	5.1	226.2	426.2	30.6	Medium	Light Grey	Odourless	No sheen	Hydrasleeve
MW200	1-12	10.5	2/11/2020	5.80	10.36	20.43	26.23	Good	1.2	55.6	36.1	5.4	152.6	352.6	31	Medium	Light Brown	Slightly Organic	No sheen	Hydrasleeve
MW205	Not Available	Not available	3/11/2020	7.61	12.79	21.96	29.57	Good	3.5	46.1	30.0	4.9	242.9	442.9	30.4	Low	Light Brown	Odourless	No sheen	Hydrasleeve
MW209	Not Available	13.5	3/11/2020	1.66	9.62	5.31	6.97	Good	1.9	1342	872.3	5.6	46	246	31.5	Turbid	Brown	Odourless	No sheen	Hydrasleeve
MW210	Not Available	10.5	2/11/2020	2.44	9.18	4.47	6.91	Good	2.0	243.5	158.3	5.8	29.1	229.1	32.2	Turbid	Brown	Organic	No sheen	Hydrasleeve
MW405	Not Available	Not available	3/11/2020	-	-	-	-	Impacted from Development	-	-	-	-	-	-	-	-	-	-	-	Unable to be sampled
MW211	Not Available	10.3	3/11/2020	5.80	13.50	16.72	22.51	Good	1.4	67.4	43.8	4.7	225.5	425.5	30.9	Low	Grey / Brown	Odourless	No sheen	Hydrasleeve
MW215	Not Available	13.75	3/11/2020	7.36	13.20	-	-	Good	1.4	112.3	73.0	5.4	73.5	273.5	31.1	Low	Light Grey	Odourless	No sheen	Hydrasleeve
MW133	1-15	Not available	3/11/2020	-	-	-	-	Damaged	-	-	-	-	-	-	-	-	-	-	-	Unable to be sampled
MW240	Not Available	Not available	3/11/2020	-	15.01	-	-	Good	2.4	62.1	40.4	4.4	276.9	476.9	31.1	Low	Colourless	Odourless	No sheen	Hydrasleeve
MW241	Not Available	Not available	3/11/2020	11.97	12.82	-	-	Good	2.3	140.3	91.2	4.3	268.5	468.5	30.2	Low	Colourless	Odourless	No sheen	Hydrasleeve
MW292	Not Available	Not available	4/11/2020	11.70	12.28	19.52	31.22	Good	1.0	176.2	114.5	5.5	43.7	243.7	31.6	Low	Colourless	Hydrocarbon	Slight sheen	Hydrasleeve
MW297	Not Available	Not available	2/11/2020	8.61	13.53	20.93	29.53	Good	1.4	42.6	27.7	4.8	98.3	298.3	31.7	Low	Colourless	Hydrocarbon	Slight sheen	Hydrasleeve
MW303	Not Available	Not available	3/11/2020	11.33	13.09	20.61	31.94	Good	1.2	388.5	252.5	5.8	-47.6	152.4	32.6	Low	Colourless	Hydrocarbon	No sheen	Hydrasleeve
MW422	Not Available	11.5	2/11/2020	5.98	11.01	21.79	27.77	Good	3.5	42.2	27.4	5.1	251.5	451.5	32.6	Low	Yellow	Odourless	No sheen	Hydrasleeve

Notes:
mbtoc: meters below top of casing
mAHD: meters Australian Height Datum
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
oC: degrees celcius
NA: not available

Table T3
PFAS Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence- RAAF Darwin

AECOM

		PFAS Full Suite																														
NHMRC (2019) PFAS Recreational Water		10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	Perfluorobutane sulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanesulfonic acid (PFDS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (FOSA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Sum of PFAS	Sum of PFHxS and PFOS	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorohexane sulfonic acid (PFHxS)
		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
	PQL	0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01		0.01	0.01	0.01	0.02
Ecological Receptors	PFAS NEMP FW 99% Species Protection																													0.00023	19	
Human Health Receptors	**PFAS NEMP Human Health Drinking Water**																												**0.07**		**0.56**	
	NHMRC (2019) PFAS Recreational Water																												**2**		**10**	

Location Code	Field ID	Sampled Date	Sample Type	Lab Report Number																													
MW297	1302_MW297_201104	2/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.48	0.1	0.06	<0.02	<0.02	0.5	0.2	1.16	<0.02	<0.02	0.68	0.14	<0.05	<0.02	<0.02	34.4	**30.6**	25.6	0.49	5.03
MW194	1302_MW194_201102	2/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.2	<0.02	<0.02	0.13	<0.02	<0.05	<0.02	<0.02	3.78	**3.19**	2.22	0.06	0.97
MW195	1302_MW195_201102	2/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.3	**0.3**	0.24	<0.01	0.06
	1302_QC100_201102	2/11/2020	Intralab Duplicate	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.18	**0.18**	0.14	<0.01	0.04
	1302_QC200_201102	2/11/2020	Interlab Duplicate	RN1294219	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	2.1	**2.1**	0.17	<0.01	0.04
MW193	1302_MW193_201102	2/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	1.08	**0.95**	0.62	0.01	0.33
MW185	1302_MW185_201102	2/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.05	<0.02	<0.05	<0.02	<0.02	0.76	**0.6**	0.26	0.02	0.34
MW210	1302_MW210_201102	2/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.09	0.03	0.15	<0.02	<0.02	0.13	<0.02	<0.05	<0.02	<0.02	4.6	**3.99**	2.91	0.05	1.08
MW200	1302_MW200_201102	2/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.08	<0.02	<0.02	0.08	<0.02	<0.05	<0.02	<0.02	1.84	**1.57**	0.97	0.02	0.6
MW139	1302_MW139_201104	2/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.1	<0.02	<0.02	0.07	<0.02	<0.05	<0.02	<0.02	2.47	**2.17**	1.55	0.03	0.62
MW180	1302_MW180_201102	2/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.05	0.05	<0.01	<0.01	0.05
MW422	1302_MW422_201102	2/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.35	0.9	<0.02	<0.02	<0.02	2.16	0.83	7.16	<0.02	<0.02	4.79	1.38	<0.05	<0.02	<0.02	96.2	**74.3**	51.1	**1.31**	23.2
MW107	1302_MW107_201102	2/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.32	<0.1	<0.02	<0.02	<0.02	0.3	0.13	0.71	<0.02	<0.02	0.57	0.12	<0.05	<0.02	<0.02	13.3	**10.9**	6.95	0.24	3.93
	1302_QC101_201102	2/11/2020	Intralab Duplicate	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.34	<0.1	<0.02	<0.02	<0.02	0.29	0.14	0.74	<0.02	<0.02	0.61	0.12	<0.05	<0.02	<0.02	13.4	**10.9**	6.65	0.23	4.28
	1302_QC201_201102	2/11/2020	Interlab Duplicate	RN1294219	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.33	0.088	<0.01	<0.01	<0.01	0.18	0.1	0.64	<0.01	<0.01	0.36	0.15	<0.02	<0.02	<0.01	9.44	**7.4**	4.3	0.19	3.1
MW103	1302_MW103_201102	2/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.57	<0.1	0.1	<0.02	<0.02	0.88	0.28	1.92	<0.02	0.11	1.16	0.19	<0.05	<0.02	<0.02	48	**42**	30.6	**0.79**	11.4
MW141	1302_MW141_201102	2/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.45	**0.45**	0.26	<0.01	0.19
MW211	1302_MW211_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.43	**0.43**	0.27	<0.01	0.16
MW144	1302_MW144_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	<0.1	<0.02	<0.02	<0.02	0.13	0.04	0.36	<0.02	<0.02	0.25	0.07	<0.05	<0.02	<0.02	8.03	**6.87**	4.87	0.1	2
MW205	1302_MW205_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.02	0.06	<0.02	<0.05	<0.02	<0.02	1.88	**1.67**	1.07	0.02	0.6
MW112	1302_MW112_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.46	0.1	0.02	<0.02	<0.02	0.36	0.13	1.05	<0.02	<0.02	0.56	0.19	<0.05	<0.02	<0.02	23.5	**20.3**	16.1	0.31	4.24
	1302_QC102_201103	3/11/2020	Intralab duplicate	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.48	0.1	0.03	<0.02	<0.02	0.34	0.13	1.05	<0.02	<0.02	0.52	0.18	<0.05	<0.02	<0.02	23	**19.9**	16	0.3	3.89
	1302_QC202_201103	3/11/2020	Interlab Duplicate	RN1294219	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.33	0.091	<0.01	<0.01	<0.01	0.16	0.085	0.75	<0.01	<0.01	0.3	0.13	<0.02	<0.02	<0.01	12.35	**10.5**	8	0.17	2.5
MW156	1302_MW156_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.49	**0.47**	0.35	<0.01	0.12
MW115	1302_MW115_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	5.58	1.2	0.38	<0.02	<0.02	4.82	1.18	10.4	0.04	0.19	6.1	2.15	<0.05	<0.02	<0.02	344	**309**	269	**3.15**	40.1
MW240	1302_MW240_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	0.83	3.21	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.01	2.5	0.28	0.19	<0.02	1.65	5.48	10.4	1.61	0.04	1.88	4.21	<0.05	<0.02	<0.02	144	**102**	88.9	**8.4**	12.7
MW241	1302_MW241_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	0.11	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.55	1.1	<0.02	0.04	<0.02	0.62	2.28	2.81	0.62	<0.02	0.72	1.99	<0.05	<0.02	<0.02	35.5	**22**	15.7	**2.63**	6.3
MW197	1302_MW197_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	<0.1	0.02	<0.02	<0.02	0.47	0.1	0.81	<0.02	<0.02	0.4	0.17	<0.05	<0.02	<0.02	25.7	**23.2**	18.3	0.3	4.93
MW215	1302_MW215_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	<0.1	<0.02	<0.02	<0.02	0.19	0.09	0.47	<0.02	<0.02	0.28	0.16	<0.05	<0.02	<0.02	9.38	**7.82**	5.2	0.13	2.62
MW128	1302_MW128_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.3	<0.1	<0.02	<0.02	<0.02	0.24	0.1	0.71	<0.02	<0.02	0.39	0.16	<0.05	<0.02	<0.02	14.2	**12**	8.49	0.21	3.55
MW148	1302_MW148_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	<0.1	<0.02	<0.02	<0.02	0.23	0.06	0.34	<0.02	<0.02	0.34	0.06	<0.05	<0.02	<0.02	11	**9.62**	6.62	0.13	3
MW303	1302_MW303_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	0.11	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	5.84	1	<0.02	<0.02	<0.02	3.48	1.52	12.2	0.02	0.05	7.24	1.86	<0.05	<0.02	<0.02	167	**131**	84.8	**3.12**	46.1
	1302_QC103_201103	3/11/2020	Intralab Duplicate	ES2039162	<0.05	<0.05	0.11	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	5.89	1.2	<0.02	<0.02	<0.02	3.38	1.55	11.8	<0.02	0.04	6.99	1.88	<0.05	<0.02	<0.02	157	**121**	77	**3.39**	44
	1302_QC203_201103	3/11/2020	Interlab Duplicate	RN1294219	<0.01	<0.01	0.071	0.018	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	3.3	1	<0.01	<0.01	<0.01	1.8	0.84	6.1	0.011	0.014	3.2	1.3	<0.02	<0.02	<0.01	75.45	**56**	31	**1.8**	25
MW191	1302_MW191_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02
MW209	1302_MW209_201103	3/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.13	<0.02	<0.02	0.08	0.03	<0.05	<0.02	<0.02	2.7	**2.34**	1.59	0.03	0.75
MW176	1302_MW176_201104	4/11/2020	Primary	ES2039162	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.13	**0.13**	0.08	<0.01	0.05
MW292	1302_MW292_201104	4/11/2020	Primary	ES2039162	<0.05	<0.05	0.26	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.84	<0.1	0.1	<0.02	<0.02	1.09	0.33	3.5	<0.02	0.05	1.12	0.35	<0.05	<0.02	<0.02	67.4	**58.9**	49	**0.87**	9.87

Notes:
mbtoc: meters below top of casing
mAHD: meters Australian Height Datum
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
oC: degrees celcius
NA: not available

Table T4
PFAS Historical Groundwater Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

				PFAS																																			
				Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluorooctanoic acid (PFOA)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	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
				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	µg/L	µg/L	µg/L	µg/L	µg/L
				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	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01
Ecological Receptors	PFAS NEMP FW 99% Species Protection								0.00023					**19**																								
Human Health Receptors	NHMRC (2019) PFAS Recreational Water													10																							2	
	PFAS NEMP Human Health Drinking Water													**0.56**																							**0.07**	
Location Code	**Field ID**	**Date/Time**	**Sample Type**																																				
MW103	**1302_MW103_170724**	**24/07/2017**	**Normal**	-	0.29	0.37	4.3	0.29	13	-	ND	0.79	0.18	0.25	0.07	ND	0.1	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**-**	-
	1302_MW103_170822	**22/08/2017**	**Normal**	-	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_MW103_170823	**23/08/2017**	**Normal**	-	0.3	0.34	4.5	0.23	8.2	-	ND	0.81	0.17	0.31	0.08	ND	0.14	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12.7**	15.09
	1302_MW103_171114	**14/11/2017**	**Normal**	-	0.03	0.04	0.56	0.02	1.4	-	ND	0.07	0.02	0.02	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.96**	2.17
	1302_MW103_180308	**8/03/2018**	**Normal**	-	0.22	0.35	3.2	0.2	14	-	ND	0.76	0.13	0.2	0.07	ND	0.1	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**17.2**	19.24
	1302_MW103_181213	**13/12/2018**	**Normal**	-	0.1	0.19	2.7	0.14	14	-	ND	0.7	0.17	0.21	0.1	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**16.7**	18.39
	1302_MW103_190320	**20/03/2019**	**Normal**	0.09	0.23	0.34	3	0.25	8.1	0.05	ND	0.58	0.12	0.18	0.07	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11.1**	13.09
	1302_MW103_191216	**16/12/2019**	**Normal**	-	0.24	0.39	4.16	0.25	17.5	-	ND	0.86	0.15	0.23	ND	ND	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**21.7**	23.9
	1302_MW103_200415	**16/04/2020**	**Primary**		0.28	0.32	4.1	0.27	11.9	-	ND	0.91	0.16	0.28	ND	ND	0.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	**16**	18.4
	1302_MW103_201102	**2/11/2020**	**Primary**	-	0.57	1.16	11.4	0.88	30.6	-	0.1	1.92	0.19	**0.79**	ND	ND	0.28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.11	ND	ND	ND	ND	ND	ND	**42**	48
MW107	**1302_MW107_170710**	**10/07/2017**	**Normal**	-	0.32	0.52	4.1	0.61	10	-	ND	0.91	0.19	0.29	0.09	ND	0.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**-**	-
	1302_MW107_170829	**29/08/2017**	**Normal**	-	0.37	0.47	3.8	0.28	8.3	-	ND	0.76	0.17	0.21	0.09	ND	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12.1**	14.55
	1302_MW107_171114	**14/11/2017**	**Normal**	-	0.32	0.49	4.8	0.35	10	-	ND	0.73	0.18	0.26	0.12	ND	0.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**14.8**	17.38
	1302_MW107_180112	**12/01/2018**	**Normal**	-	0.3	0.43	3.9	0.21	7.9	-	ND	0.77	0.19	0.19	0.09	ND	0.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11.8**	14.1
	1302_MW107_180308	**8/03/2018**	**Normal**	-	0.18	0.34	2.7	0.18	6.1	-	ND	0.59	0.18	0.17	0.08	ND	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**8.8**	10.61
	1302_MW107_181213	**13/12/2018**	**Normal**	-	0.3	0.51	4.3	0.23	9.6	-	ND	0.69	0.2	0.17	0.1	ND	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**13.9**	16.19
	1302_MW107_190320	**20/03/2019**	**Normal**	0.12	0.32	0.42	3	0.27	6.1	0.02	ND	0.62	0.17	0.16	0.1	ND	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.1**	11.4
	1302_MW107_191216	**16/12/2019**	**Normal**	-	0.33	0.42	3.38	0.24	6.28	-	ND	0.7	0.14	0.15	ND	ND	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.71**	11.7
	1302_MW107_200414	**16/04/2020**	**Primary**		0.41	0.4	3.98	0.23	6.4	-	ND	0.93	0.16	0.22	ND	ND	0.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**10.4**	12.9
	1302_MW107_201102	**2/11/2020**	**Primary**	-	0.32	0.57	3.93	0.3	6.95		ND	0.71	0.12	0.24	ND	ND	0.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**10.9**	13.3
MW112	**1302_MW112_170803**	**3/08/2017**	**Normal**	-	0.61	0.59	4.5	0.37	20	-	0.02	1.4	0.25	0.33	0.16	ND	0.16	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	**24.5**	28.43
	1302_QCGW2_170803	**3/08/2017**	**Interlab_D**	-	0.3	0.33	3.04	0.26	8.82	-	ND	0.66	0.13	0.21	ND	ND	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11.9**	13.8
	1302_MW112_170824	**24/08/2017**	**Normal**	-	0.52	0.55	5.7	0.26	15	-	ND	1.3	0.28	0.29	0.14	ND	0.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**20.7**	24.18
	1302_MW112_171113	**13/11/2017**	**Normal**	-	0.46	0.58	5.9	0.24	14	-	ND	1.3	0.28	0.34	0.13	ND	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	**19.9**	23.45
	1302_MW112_180112	**12/01/2018**	**Normal**	-	0.43	0.49	3.4	0.27	15	-	ND	1	0.18	0.25	0.12	ND	0.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	**18.4**	21.28
	1302_MW112_180306	**6/03/2018**	**Normal**	-	0.35	0.39	2.7	0.36	7.8	-	0.03	0.88	0.14	0.19	0.09	ND	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	**10.5**	13.03
	1302_MW112_181215	**15/12/2018**	**Normal**	-	0.49	0.41	5.5	0.69	23	-	0.02	1.4	0.24	0.31	0.16	ND	0.18	0.01	ND	0.05	0.02	ND	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**28.5**	32.51
	1302_MW112_190320	**20/03/2019**	**Normal**	0.12	0.27	0.25	1.9	0.18	6.6	0.08	ND	0.57	0.11	0.13	0.09	ND	0.07	ND	ND	ND	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**8.5**	10.38
	1302_MW112_191217	**17/12/2019**	**Normal**	-	0.51	0.42	3.89	0.35	13.7	-	ND	1.18	0.21	0.28	0.1	ND	0.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**17.6**	20.8
	1302_MW112_200414	**16/04/2020**	**Primary**	-	0.58	0.43	4.28	0.39	12.8	-	ND	1.37	0.2	0.32	0.1	ND	0.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**17.1**	20.6
	1302_MW112_201103	**13/11/2020**	**Primary**	-	0.46	0.56	4.24	0.36	16.1	-	0.02	1.05	0.19	0.31	0.1	ND	0.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**20.3**	23.5
MW115	**1302_MW115_170803**	**3/08/2017**	**Normal**	-	4.3	4	31	2.3	80	-	0.02	7.9	1.7	**2.1**	0.89	ND	0.83	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**111**	135.07
	1302_MW115_170824	**24/08/2017**	**Normal**	-	5.7	5.1	46	6.4	340	-	ND	10	2.9	**3**	1.4	0.01	1.2	ND	0.03	ND	ND	ND	ND	0.06	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**386**	421.84
	1302_MW115_171113	**13/11/2017**	**Normal**	-	7.4	6.2	57	6.9	260	-	ND	14	3.6	**4.1**	1.7	ND	1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**317**	362.6
	1302_MW115_180112	**12/01/2018**	**Normal**	-	3.7	4	28	2.7	130	-	ND	6.8	1.4	**1.9**	0.7	ND	0.71	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**158**	179.91
	1302_MW115_180306	**6/03/2018**	**Normal**	-	2.3	2.7	16	3	52	-	0.06	4.1	0.77	**1.3**	0.37	ND	0.44	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**68**	83.06
	1302_MW115_7_180509	**9/05/2018**	**Normal**	-	3.1	3.2	33	2.3	89	-	ND	6.7	1.5	**2.3**	0.68	ND	0.7	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	0.07	ND	ND	ND	ND	ND	ND	ND	**122**	142.58
	1302_MW115_11_180509	**9/05/2018**	**Normal**	-	3.1	3.6	32	2.7	130	-	ND	7.3	1.5	**2.4**	0.73	0.01	0.73	ND	0.04	ND	ND	0.01	ND	ND	0.01	ND	0.15	ND	ND	ND	ND	ND	ND	ND	ND	**162**	184.28
	1302_MW115_13_180509	**9/05/2018**	**Normal**	-	3.2	3.4	30	2.5	140	-	ND	7.2	1.5	**2.3**	0.73	0.02	0.73	ND	0.03	ND	ND	ND	ND	ND	0.02	ND	0.13	ND	ND	ND	ND	ND	ND	ND	ND	**170**	191.76
	1302_MW115_9_180509	**9/05/2018**	**Normal**	-	3.4	3.4	32	2.6	130	-	ND	7.4	1.7	**2.5**	0.78	ND	0.78	ND	0.03	ND	ND	ND	ND	ND	0.01	ND	0.1	ND	ND	ND	ND	ND	ND	ND	ND	**162**	184.7
	1302_MW115_181215	**15/12/2018**	**Normal**	-	6.1	5.7	59	6.5	220	-	ND	13	2.8	**3.8**	1.4	ND	1.5	ND	ND	ND	ND	ND	ND	0.23	ND	ND	0.25	ND	ND	ND	ND	ND	ND	ND	ND	**279**	320.28
	1302_MW115_190320	**20/03/2019**	**Normal**	1.5	2.9	2.4	18	1.5	73	1.2	0.05	4.5	0.98	**1.5**	0.6	ND	0.53	ND	0.02	ND	ND	ND	ND	0.11	ND	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	**91**	108.87
	1302_MW115_191217	**17/12/2019**	**Normal**	-	6.64	7.24	45.8	6.94	255	-	0.21	9.6	2.56	**3.05**	1.5	ND	1.31	ND	0.03	ND	ND	ND	ND	0.05	ND	ND	0.14	ND	ND	ND	ND	ND	ND	ND	ND	**301**	340
	1302_MW115_200414	**16/04/2020**	**Primary**	-	2.74	2.52	22.2	1.88	71.6	-	ND	5.38	0.86	**1.48**	0.4	ND	0.44	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.14	ND	ND	ND	ND	ND	ND	ND	ND	**93.8**	110
	1302_MW115_201103	**3/11/2020**	**Primary**	-	5.58	6.1	40.1	4.82	269	-	0.38	10.4	2.15	**3.15**	1.2	ND	1.18	ND	0.04	ND	ND	ND	Nd	ND	ND	ND	0.19	ND	ND	ND	ND	ND	ND	ND	Nd	**309**	344
MW128	**1302_MW128_170724**	**24/07/2017**	**Normal**	-	0.26	0.28	2.5	0.19	7.1	-	ND	0.54	0.12	0.14	0.06	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**-**	-
	1302_MW128_170901	**1/09/2017**	**Normal**	-	0.23	0.37	3.2	0.22	6.8	-	ND	0.6	0.14	0.17	0.07	ND	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**10**	11.89
	1302_MW128_171116	**16/11/2017**	**Normal**	-	0.24	0.33	3.3	0.24	7.1	-	ND	0.57	0.13	0.2	0.09	ND	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**10.4**	12.29
	1302_MW128_180115	**15/01/2018**	**Normal**	-	0.31	0.36	2.9	0.14	6.8	-	ND	0.61	0.14	0.17	0.07	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.7**	11.57
	1302_MW128_180308	**8/03/2018**	**Normal**	-	0.29	0.34	3	0.18	8	-	ND	0.57	0.11	0.17	0.07	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11**	12.81
	1302_MW128_4_180509	**9/05/2018**	**Normal**	-	0.3	0.38	3.8	0.27	6.2	-	ND	0.68	0.14	0.2	0.07	ND	0.1	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**10**	12.15
	1302_MW128_12_180509	**9/05/2018**	**Normal**	-	0.33	0.43	4.3	0.34	8	-	ND	0.77	0.15	0.23	0.09	ND	0.11	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12.3**	14.76
	1302_MW128_8_180509	**9/05/2018**	**Normal**	-	0.34	0.43	4.3	0.33	8.6	-	ND	0.75	0.15	0.22	0.1	ND	0.11	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12.9**	15.34
	1302_MW128_181213	**13/12/2018**	**Normal**	-	0.19	0.29	2.8	0.18	7.4	-	ND	0.29	0.06	0.12	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**10.2**	11.38
	1302_MW128_190321	**21/03/2019**	**Normal**	0.09	0.23	0.27	2.7	0.14	5.2	ND	ND	0.59	0.15	0.18	0.08	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.9**	9.71
	1302_MW128_191217	**17/12/2019**	**Normal**	-	0.22	0.28	2.49	0.17	5.92	-	ND	0.52	0.12	0.13	ND	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**8.41**	9.92
	1302_MW128_200415	**16/04/2020**	**Primary**	-	0.29	0.26	2.9	0.2	6.39	-	ND	0.72	0.13	0.18	ND	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.29**	11.2
	1302_MW128_201103	**3/11/2020**	**Primary**	-	0.3	0.39	3.55	0.24	8.49	-	ND	0.71	0.16	0.21	ND	ND	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12**	14.2

Table T4
PFAS Historical Groundwater Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

				PFAS																															
				Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluorooctanoic acid (PFOA)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	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
				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	µg/L
				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	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01
Ecological Receptors	PFAS NEMP FW 99% Species Protection								0.00023					19																					
Human Health Receptors	NHMRC (2019) PFAS Recreational Water													10																				2	
	PFAS NEMP Human Health Drinking Water													0.56																				0.07	
Location Code	Field ID	Date/Time	Sample Type																																
MW133	1302_MW133_170807	7/08/2017	Normal	-	1	1.3	10	1.3	62	-	ND	3.8	0.76	0.94	0.29	ND	0.35	ND	0.02	ND	ND	ND	ND	0.42	0.05	ND	ND	ND	ND	ND	ND	ND	ND	72	82.23
	1302_MW133_170828	28/08/2017	Normal	-	0.93	1.1	9	1.1	51	-	ND	3.2	0.56	0.74	0.25	ND	0.29	ND	0.01	ND	ND	ND	ND	0.37	0.04	ND	0.12	ND	ND	ND	ND	ND	ND	60	68.71
	1302_MW133_171115	15/11/2017	Normal	-	0.63	0.85	8.4	0.91	53	-	ND	3.2	0.4	0.72	0.18	ND	0.26	ND	0.02	ND	ND	ND	ND	0.17	0.04	ND	0.07	ND	ND	ND	ND	ND	ND	61.4	68.85
	1302_MW133_180112	12/01/2018	Normal	-	0.35	0.55	6.8	0.66	45	-	ND	3	0.63	0.56	0.19	ND	0.27	ND	0.02	ND	ND	ND	ND	0.27	0.07	ND	0.07	ND	ND	ND	ND	ND	ND	51.8	58.44
	1302_QCMW15_180112	12/01/2018	Field_D	-	0.34	0.55	7.3	0.64	47	-	ND	3	0.59	0.59	0.2	0.01	0.28	ND	0.02	ND	ND	ND	ND	0.26	0.07	ND	0.08	ND	ND	ND	ND	ND	ND	54.3	60.93
	1302_MW133_180307	7/03/2018	Normal	-	1.1	1.5	13	1.6	99	-	ND	4.4	0.72	1.2	0.32	ND	0.44	ND	0.03	ND	ND	ND	ND	0.07	0.07	ND	ND	ND	ND	ND	ND	ND	ND	112	123.45
	1302_MW133_8_180508	8/05/2018	Normal	-	0.38	0.77	4.8	0.59	29	-	0.02	1.7	0.25	0.45	0.12	0.01	0.15	ND	0.02	ND	ND	ND	ND	0.05	0.02	ND	ND	ND	ND	ND	ND	ND	ND	33.8	38.33
	1302_MW133_11_180508	8/05/2018	Normal	-	0.39	0.71	4.5	0.57	35	-	0.04	1.7	0.24	0.45	0.12	ND	0.15	ND	0.01	ND	ND	ND	ND	0.05	0.03	ND	0.06	ND	ND	ND	ND	ND	ND	39.5	44.02
	1302_MW133_14_180508	8/05/2018	Normal	-	0.59	1.3	8.6	1.3	62	-	0.05	3	0.42	0.79	0.18	0.01	0.24	ND	0.01	ND	ND	ND	ND	0.09	0.03	ND	0.09	ND	ND	ND	ND	ND	ND	70.6	78.7
	1302_MW133_181213	13/12/2018	Normal	-	0.66	1.1	13	2.1	68	-	0.04	13	0.79	1.3	0.29	0.02	0.47	ND	0.03	ND	ND	ND	ND	0.38	0.1	ND	0.07	ND	ND	ND	ND	ND	ND	81	101.35
	1302_QCMW3_181213	13/12/2018	Field_D	-	0.87	2.5	13	1.1	120	-	0.73	4.5	0.81	1.4	0.3	0.02	0.48	ND	0.03	ND	ND	ND	ND	0.42	0.12	ND	0.22	ND	ND	ND	ND	ND	ND	133	146.5
	1302_MW133_190320	20/03/2019	Normal	0.29	0.54	0.91	5.8	1.1	34	0.58	0.03	2	0.33	0.53	0.18	ND	0.2	ND	0.01	ND	ND	ND	ND	0.08	0.04	ND	0.08	ND	ND	ND	ND	ND	ND	39.8	46.7
		16/04/2020		Damaged - could not sample																															
		4/11/2020		Damaged - could not sample																															
MW139	1302_MW139_170724	24/07/2017	Normal	-	0.11	0.13	0.96	0.12	4.1	-	ND	0.19	0.05	0.05	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
	1302_MW139_170828	28/08/2017	Normal	-	0.15	0.15	1.2	0.14	5.2	-	ND	0.23	0.05	0.07	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.4	7.22
	1302_MW139_171115	15/11/2017	Normal	-	0.15	0.15	1.2	0.11	4.5	-	ND	0.23	0.05	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.7	6.48
	1302_MW139_180112	12/01/2018	Normal	-	0.03	0.03	0.24	0.02	1.3	-	ND	0.07	0.02	0.02	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.54	1.74
	1302_MW139_180307	7/03/2018	Normal	-	0.01	0.01	0.13	ND	0.43	-	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.56	0.6
	1302_MW139_181213	13/12/2018	Normal	-	0.07	0.08	0.82	0.08	3.2	-	ND	0.15	0.04	0.04	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.02	4.5
	1302_MW139_190320	20/03/2019	Normal	ND	0.02	0.01	0.17	ND	0.42	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.59	0.65
	1302_MW139_191217	17/12/2019	Normal	-	0.07	0.08	0.61	0.05	1.7	-	ND	0.12	0.02	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.31	2.67
	1302_MW139_200414	16/04/2020	Primary	-	ND	ND	0.2	ND	0.51	-	ND	0.04	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.71	0.76
	1302_MW139_201104	4/11/2020	Primary	-	0.06	0.07	0.62	0.04	1.55	-	ND	0.1	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.17	2.47
MW141	1302_MW141_170724	24/07/2017	Normal	-	ND	0.01	0.13	ND	0.16	-	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
	1302_MW141_170828	28/08/2017	Normal	-	ND	0.01	0.13	ND	0.14	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.27	0.28
	1302_MW141_180307	7/03/2018	Normal	-	ND	ND	0.12	ND	0.11	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.23	0.23
	1302_MW141_181213	13/12/2018	Normal	-	ND	0.01	0.21	0.01	0.19	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	0.42
	1302_MW141_190320	20/03/2019	Normal	ND	ND	ND	0.12	ND	0.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.27	0.27
	1302_MW141_191217	19/12/2019	Normal	-	ND	ND	0.14	ND	0.11	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.25	0.25
	1302_MW141_200414	16/04/2020	Primary	-	ND	ND	0.13	ND	0.08	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.21	0.21
	1302_MW141_201102	2/11/2020	Primary	-	ND	ND	0.19	ND	0.26	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.45	0.45
MW144	1302_MW144_170724	24/07/2017	Normal	-	0.18	0.2	1.5	0.11	3.4	-	ND	0.29	0.06	0.07	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-
	1302_MW144A_170815	15/08/2017	Normal	-	0.23	0.26	1.9	0.14	3.6	-	ND	0.33	0.06	0.09	ND	ND	0.04	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.5	6.66
	1302_MW144B_170815	15/08/2017	Normal	-	0.23	0.26	1.9	0.13	3.4	-	ND	0.32	0.06	0.09	ND	ND	0.04	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.3	6.44
	1302_MW144C_170815	15/08/2017	Normal	-	0.23	0.26	1.9	0.13	3.2	-	ND	0.33	0.06	0.08	ND	ND	0.04	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.1	6.24
	1302_MW144_170828	28/08/2017	Normal	-	0.2	0.22	1.7	0.11	3.5	-	ND	0.29	0.05	0.08	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.2	6.18
	1302_MW144_171115	15/11/2017	Normal	-	0.21	0.22	1.8	0.1	3.6	-	ND	0.3	0.05	0.08	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.4	6.39
	1302_MW144_180111	11/01/2018	Normal	-	0.18	0.2	1.5	0.08	3.4	-	ND	0.26	0.05	0.07	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.9	5.77
	1302_MW144_180307	7/03/2018	Normal	-	0.13	0.11	0.95	0.05	1.6	-	ND	0.11	0.02	0.03	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.55	3.02
	1302_MW144_181213	13/12/2018	Normal	-	0.23	0.31	2.3	0.09	5.6	-	ND	0.38	0.08	0.12	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.9	9.16
	1302_MW144_190320	20/03/2019	Normal	0.07	0.16	0.14	1.1	0.08	1.7	ND	ND	0.16	0.03	0.05	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.8	3.51
	1302_MW144_191216	16/12/2019	Normal	-	0.17	0.19	1.56	0.1	3.24	-	ND	0.29	0.06	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.8	5.7
	1302_MW144_200414	16/04/2020	Primary	-	0.15	0.1	1.08	0.06	1.67	-	ND	0.19	0.03	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.75	3.33
	1302_MW144_201103	3/11/2020	Primary	-	0.21	0.25	2	0.13	4.87	-	ND	0.36	0.07	0.1	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.87	8.03

Table T4
PFAS Historical Groundwater Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

				PFAS																															
				Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluorooctanoic acid (PFOA)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	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
				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	µg/L
				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	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01	0.02	0.05	0.02	0.05	0.05	0.02	0.05	0.01	0.01
Ecological Receptors	PFAS NEMP FW 99% Species Protection								0.00023					19																					
Human Health Receptors	NHMRC (2019) PFAS Recreational Water													10																				2	
	PFAS NEMP Human Health Drinking Water													0.56																				0.07	
Location Code	**Field ID**	**Date/Time**	**Sample Type**																																
MW148	**1302_MW148_170807**	**7/08/2017**	**Normal**	-	0.22	0.33	2.7	0.17	4.5	-	ND	0.32	0.06	0.14	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.2**	8.48
	1302_MW148A_170824	**24/08/2017**	**Normal**	-	0.2	0.21	3.1	0.18	5.7	-	ND	0.34	0.08	0.14	ND	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**8.8**	10.02
	1302_MW148B_170824	**24/08/2017**	**Normal**	-	0.2	0.19	3	0.16	4.3	-	ND	0.31	0.07	0.13	ND	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.3**	8.43
	1302_MW148C_170824	**24/08/2017**	**Normal**	-	0.2	0.21	3.3	0.16	8	-	ND	0.33	0.07	0.14	ND	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11.3**	12.48
	1302_MW148_170901	**1/09/2017**	**Normal**	-	0.19	0.3	2.8	0.22	5.2	-	ND	0.33	0.07	0.13	ND	ND	0.06	ND	ND	ND	ND	ND	ND	0.06	0.02	ND	ND	ND	ND	ND	ND	ND	ND	**8**	9.38
	1302_MW148_171116	**16/11/2017**	**Normal**	-	0.17	0.24	2.6	0.23	7.5	-	ND	0.26	0.05	0.14	ND	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**10.1**	11.25
	1302_MW148_180115	**15/01/2018**	**Normal**	-	0.23	0.31	2.4	0.17	7.9	-	ND	0.31	0.06	0.11	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**10.3**	11.54
	1302_QCMW19_180115	**15/01/2018**	**Field_D**	-	0.23	0.31	2.3	0.15	6.1	-	ND	0.3	0.06	0.12	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**8.4**	9.62
	1302_MW148_180308	**8/03/2018**	**Normal**	-	0.22	0.28	2.6	0.18	7.6	-	ND	0.3	0.05	0.12	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**10.2**	11.4
	1302_MW148_8_180509	**9/05/2018**	**Normal**	-	0.24	0.34	3.2	0.28	6.1	-	ND	0.35	0.07	0.15	0.05	ND	0.07	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.3**	10.86
	1302_MW148_4_180509	**9/05/2018**	**Normal**	-	0.22	0.28	3	0.2	6.2	-	ND	0.41	0.08	0.15	0.06	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.2**	10.66
	1302_MW148_12_180509	**9/05/2018**	**Normal**	-	0.23	0.34	3.3	0.25	5.5	-	ND	0.33	0.07	0.15	ND	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**8.8**	10.24
	1302_MW148_181213	**13/12/2018**	**Normal**	-	0.19	0.3	3.2	0.17	7.8	-	ND	0.34	0.06	0.12	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11**	12.22
	1302_MW148_190320	**20/03/2019**	**Normal**	0.08	0.22	0.22	2.4	0.18	4.6	0.02	ND	0.28	0.06	0.11	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7**	8.22
	1302_MW148_191217	**17/12/2019**	**Normal**	-	0.23	0.2	2.25	0.18	4.69	-	ND	0.3	0.06	0.1	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**6.94**	8.06
	1302_MW148_200414	**16/04/2020**	**Primary**	-	0.23	0.18	2.22	0.17	4.98	-	ND	0.33	0.05	0.12	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.2**	8.33
	1302_MW148_201103	**3/11/2020**	**Primary**	-	0.22	0.34	3	0.23	6.62	-	ND	0.34	0.06	0.13	ND	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.62**	11
MW156	**1302_MW156_170807**	**7/08/2017**	**Normal**	-	0.24	0.26	2.3	0.18	5.7	-	ND	0.43	0.1	0.12	0.06	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**8**	9.44
	1302_MW156A_170823	**23/08/2017**	**Normal**	-	0.23	0.23	2.3	0.13	5.6	-	ND	0.45	0.1	0.12	0.06	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.9**	9.27
	1302_MW156B_170823	**23/08/2017**	**Normal**	-	0.22	0.23	2.1	0.1	4	-	ND	0.44	0.1	0.1	0.06	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**6.1**	7.4
	1302_MW156C_170823	**23/08/2017**	**Normal**	-	0.23	0.22	1.8	0.06	1.9	-	ND	0.43	0.1	0.07	0.06	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.7**	4.91
	1302_MW156_170905	**5/09/2017**	**Normal**	-	0.25	0.22	2.7	0.11	6.5	-	ND	0.45	0.11	0.16	0.06	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.2**	10.62
	1302_MW156_171114	**14/11/2017**	**Normal**	-	0.19	0.26	2.8	0.23	8.7	-	ND	0.4	0.11	0.16	0.07	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11.5**	12.97
	1302_MW156_180111	**11/01/2018**	**Normal**	-	0.2	0.21	1.8	0.1	5.7	-	ND	0.39	0.08	0.1	0.05	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.5**	8.67
	1302_MW156A_180130	**30/01/2018**	**Normal**	-	0.16	0.21	2.4	0.13	5	-	ND	0.37	0.1	0.11	0.06	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.4**	8.59
	1302_MW156B_180130	**30/01/2018**	**Normal**	-	0.18	0.21	2.2	0.11	4.4	-	ND	0.39	0.1	0.11	0.06	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**6.6**	7.81
	1302_MW156C_180131	**31/01/2018**	**Normal**	-	0.17	0.22	2.4	0.13	5.1	-	ND	0.38	0.1	0.11	0.06	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.5**	8.72
	1302_MW156_180307	**7/03/2018**	**Normal**	-	0.37	0.41	3.4	0.2	8.9	-	ND	0.71	0.14	0.17	0.09	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12.3**	14.47
	1302_MW156_11_180508	**8/05/2018**	**Normal**	-	0.22	0.36	2.5	0.18	4.9	-	ND	0.51	0.1	0.14	0.06	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.4**	9.03
	1302_MW156_7_180508	**8/05/2018**	**Normal**	-	0.27	0.46	3	0.22	6.1	-	ND	0.63	0.11	0.17	0.07	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.1**	11.1
	1302_MW156_3_180508	**8/05/2018**	**Normal**	-	0.31	0.53	3.5	0.29	8.2	-	ND	0.74	0.14	0.21	0.09	ND	0.08	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**11.7**	14.1
	1302_MW156_181213	**13/12/2018**	**Normal**	-	0.21	0.22	2.2	0.25	5.9	-	ND	0.5	0.11	0.14	0.06	ND	0.06	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**8.1**	9.66
	1302_MW156_190320	**20/03/2019**	**Normal**	0.08	0.19	0.21	1.9	0.14	5.2	0.02	ND	0.35	0.07	0.09	0.06	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.1**	8.35
	1302_MW156_191217	**17/12/2019**	**Normal**	-	0.04	0.03	0.35	0.02	0.82	-	ND	0.07	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.17**	1.34
	1302_MW156_200414	**16/04/2020**	**Primary**	-	ND	ND	0.1	ND	0.48	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.58**	0.58
	1302_MW156_201103	**3/11/2020**	**Primary**	-	ND	ND	0.12	ND	0.35	-	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.47**	0.49
MW176	**1302_MW176_170905**	**5/09/2017**	**Normal**	-	ND	ND	0.06	ND	0.09	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.15**	0.15
	1302_MWQC39MW_170905	**5/09/2017**	**Interlab_D**	-	ND	ND	0.08	ND	0.13	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.21**	0.21
	1302_MW176_180307	**7/03/2018**	**Normal**	-	ND	ND	0.04	ND	0.09	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.13**	0.13
	1302_MW176_190321	**21/03/2019**	**Normal**	ND	ND	ND	0.03	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.1**	0.1
		16/04/2020		**Did not sample due to insufficient water**																															
	1302_MW176_201104	**4/11/2020**	**Primary**	-	ND	ND	0.05	ND	0.08	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.13	0.13
MW180	**1302_MW180_170906**	**6/09/2017**	**Normal**	-	ND	ND	0.06	ND	0.03	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.09**	ND
	1302_MW180_180307	**7/03/2018**	**Normal**	-	0.01	ND	0.11	ND	0.01	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.12**	0.13
	1302_QCMW1_181213	**13/12/2018**	**Field_D**	-	0.01	0.01	0.12	ND	0.35	-	ND	0.02	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.47**	0.79
	1302_MW180_181213	**13/12/2018**	**Normal**	-	ND	ND	0.08	ND	0.09	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.17**	0.33
	1302_MW180_190321	**21/03/2019**	**Normal**	ND	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND
	1302_MW180_191216	**16/12/2019**	**Normal**	-	ND	ND	0.05	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.05
	1302_MW180_200415	**16/04/2020**	**Primary**	-	ND	ND	0.05	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.05
	1302_MW180_201102	**2/11/2020**	**Primary**	-	ND	ND	0.05	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.05
MW185	**1302_MW185_170905**	**5/09/2017**	**Normal**	-	ND	ND	0.03	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.03	ND
	1302_MW185_171116	**16/11/2017**	**Normal**	-	ND	ND	0.02	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	ND
	1302_MW185_180115	**15/01/2018**	**Normal**	-	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_MW185_180322	**22/03/2018**	**Normal**	-	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_MW185_181213	**13/12/2018**	**Normal**	-	0.07	0.07	0.47	ND	0.23	-	ND	0.05	0.02	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.7**	0.93
	1302_MW185_190218	**18/02/2019**	**Normal**	ND	0.02	0.02	0.14	ND	0.03	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.17**	0.23
	1302_MW185_190321	**21/03/2019**	**Normal**	ND	ND	ND	0.04	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND
	1302_MW185_191216	**16/12/2019**	**Normal**	-	0.04	0.04	0.26	ND	0.1	-	ND	0.06	0.02	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.36**	0.53
		16/04/2020		**Could not locate**																															
	1302_MW185_201102	**2/11/2020**	**Primary**	-	0.03	0.05	0.34	ND	0.26	-	ND	0.06	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.6**	0.76
MW191	**1302_MW191_170905**	**5/09/2017**	**Normal**	-	0.08	0.08	1	0.03	1.8	-	ND	0.14	0.03	0.04	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.8**	3.22
	1302_QC3MW_170905	**11/10/2017**	**Interlab_D**	-	0.21	0.11	1.21	0.06	2.09	-	ND	0.18	0.02	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.3**	3.93
	1302_MW191_171116	**16/11/2017**	**Normal**	-	0.07	0.1	1	0.06	2.9	-	ND	0.16	0.04	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.9**	4.42
	1302_MW191_180115	**15/01/2018**	**Normal**	-	0.08	0.1	0.82	0.04	2.2	-	ND	0.16	0.04	0.05	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.02**	3.51
	1302_MW191_180309	**8/03/2018**	**Normal**	-	0.06	0.08	0.63	0.03	1.8	-	ND	0.11	0.02	0.03	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.43**	2.78
	1302_MW191_4_180509	**9/05/2018**	**Normal**	-	0.07	0.11	1.4	0.04	2	-	ND	0.16	0.04	0.05	ND	ND	0.03	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.4**	3.91
	1302_MW191_7_180509	**9/05/2018**	**Normal**	-	0.07	0.11	1.3	0.04	1.9	-	ND	0.15	0.04	0.05	ND	ND	0.03	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.2**	3.7
	1302_MW191_11_180509	**9/05/2018**	**Normal**	-	0.07	0.11	1.3	0.04	1.9	-	ND	0.14	0.04	0.05	ND	ND	0.03	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.2**	3.69
	1302_MW191_181213	**13/12/2018**	**Normal**	-	0.08	0.09	1	0.05	2.9	-	ND	0.18	0.04	0.05	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.9**	4.41
	1302_QCMW5_181213	**13/12/2018**	**Field_D**	-	0.07	0.1	1.1	0.05	2.7	-	ND	0.15	0.03	0.05	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.8**	4.27
	1302_MW191_190321	**21/03/2019**	**Normal**	0.01	0.06	0.07	0.91	0.03	1.7	ND	ND	0.15	0.03	0.04	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.61**	3.02
	1302_MW191_191218	**18/12/2019**	**Normal**	-	0.08	0.08	0.76	0.04	1.7	-	ND	0.14	0.03	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.46**	2.86
	1302_MW191_200415	**16/04/2020**	**Primary**		0.06	0.06	0.74	0.03	1.17	-	ND	0.13	0.02	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.91**	2.24
	1302_MW191_201103	**3/11/2020**	**Primary**	-	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table T4
PFAS Historical Groundwater Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

				PFAS																																					
				Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluorooctanoic acid (PFOA)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	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
				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	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
				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	0.01	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	0.05	0.02	0.05	0.01	0.01
Ecological Receptors	PFAS NEMP FW 99% Species Protection								0.00023					**19**																										
Human Health Receptors	NHMRC (2019) PFAS Recreational Water													10																								2	
	PFAS NEMP Human Health Drinking Water													**0.56**																								**0.07**	
Location Code	**Field ID**	**Date/Time**	**Sample Type**																																						
MW193	**1302_MW193_170905**	**5/09/2017**	**Normal**	-	0.15	0.15	1.6	0.06	2.5	-	ND	0.23	0.05	0.07	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.1**	4.84
	1302_QC2MW_170905	**11/10/2017**	**Interlab_D**	-	0.32	0.22	1.83	0.12	3.03	-	ND	0.29	0.05	0.07	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.86**	5.97
	1302_MW193_171116	**16/11/2017**	**Normal**	-	0.13	0.15	1.4	0.07	2.9	-	ND	0.21	0.04	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.3**	4.99
	1302_MW193_180115	**15/01/2018**	**Normal**	-	0.13	0.18	1.2	0.07	2.6	-	ND	0.2	0.05	0.06	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.8**	4.51
	1302_MW193A_180205	**5/02/2018**	**Normal**	-	0.03	0.04	0.35	0.02	0.8	-	ND	0.07	0.02	0.02	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.15**	1.36
	1302_MW193B_180205	**5/02/2018**	**Normal**	-	0.03	0.04	0.34	0.02	0.72	-	ND	0.07	0.02	0.02	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.06**	1.27
	1302_MW193C_180205	**5/02/2018**	**Normal**	-	0.03	0.03	0.3	0.02	0.67	-	ND	0.06	0.02	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.97**	1.15
	1302_MW193_180309	**8/03/2018**	**Normal**	-	0.03	0.03	0.23	0.01	0.71	-	ND	0.04	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.94**	1.06
	1302_MW193_181213	**13/12/2018**	**Normal**	-	0.12	0.16	1.6	0.1	3.4	-	ND	0.33	0.07	0.08	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5**	5.9
	1302_MW193_190321	**21/03/2019**	**Normal**	0.05	0.13	0.15	1.4	0.07	1.7	ND	ND	0.22	0.05	0.06	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.1**	3.85
	1302_MW193_191218	**18/12/2019**	**Normal**	-	0.12	0.12	1.24	0.07	1.89	-	ND	0.24	0.06	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.13**	3.83
	1302_MW193_200415	**16/04/2020**	**Primary**	-	0.02	ND	0.27	0.02	1.1	-	ND	0.05	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.37**	1.47
	1302_MW193_201102	**2/11/2020**	**Primary**	-	0.03	0.04	0.33	ND	0.62	-	ND	0.05	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.95**	1.08
MW194	**1302_MW194_170906**	**6/09/2017**	**Normal**	-	0.08	0.13	1.1	0.08	3.8	-	ND	0.24	0.05	0.08	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.9**	5.6
	1302_MW194_171116	**16/11/2017**	**Normal**	-	0.11	0.11	1.1	0.07	4.9	-	ND	0.25	0.05	0.08	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**6**	6.7
	1302_MW194A_180205	**5/02/2018**	**Normal**	-	0.09	0.1	0.99	0.06	2.9	-	ND	0.2	0.04	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.89**	4.47
	1302_MW194B_180205	**5/02/2018**	**Normal**	-	0.09	0.1	0.9	0.06	2.5	-	ND	0.2	0.05	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.4**	3.99
	1302_MW194C_180205	**5/02/2018**	**Normal**	-	0.08	0.1	0.94	0.06	2.4	-	ND	0.19	0.04	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.34**	3.9
	1302_MW194_180309	**8/03/2018**	**Normal**	-	0.08	0.1	0.81	0.06	3.1	-	ND	0.19	0.03	0.05	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.91**	4.44
	1302_MW194_181213	**13/12/2018**	**Normal**	-	0.15	0.19	1.5	0.06	3.3	-	ND	0.26	0.05	0.08	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.8**	5.62
	1302_MW194_190321	**21/03/2019**	**Normal**	0.04	0.14	0.13	1.2	0.07	2.1	ND	ND	0.29	0.07	0.07	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.3**	4.14
	1302_MW194_191218	**18/12/2019**	**Normal**	-	0.1	0.1	0.87	0.06	2.09	-	ND	0.18	0.04	0.04	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.96**	3.5
	1302_MW194_200415	**16/04/2020**	**Primary**	-	0.12	0.08	0.87	0.06	2.43	-	ND	0.23	0.03	0.06	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.3**	3.9
	1302_MW194_201102	**2/11/2020**	**Primary**	-	0.11	0.13	0.97	0.06	2.22	-	ND	0.2	ND	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.19**	3.78
MW195	**1302_MW195_170906**	**6/09/2017**	**Normal**	-	0.04	0.06	0.47	0.02	0.76	-	ND	0.06	0.01	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.23**	1.44
	1302_MW195_171116	**16/11/2017**	**Normal**	-	0.03	0.03	0.28	0.01	0.53	-	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.81**	0.9
	1302_MW195_180115	**15/01/2018**	**Normal**	-	0.1	0.11	0.76	0.03	1.1	-	ND	0.07	0.02	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.86**	2.21
	1302_MW195_180309	**8/03/2018**	**Normal**	-	0.03	0.04	0.32	0.02	0.86	-	ND	0.04	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.18**	1.32
	1302_MW195_181213	**13/12/2018**	**Normal**	-	0.09	0.11	0.87	0.02	1.1	-	ND	0.07	0.01	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.97**	2.29
	1302_MW195_190321	**21/03/2019**	**Normal**	0.02	0.06	0.06	0.54	0.03	0.78	ND	ND	0.11	0.04	0.03	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.32**	1.68
	1302_MW195_191218	**18/12/2019**	**Normal**	-	ND	ND	0.04	ND	0.07	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.11**	0.11
	1302_MW195_200415	**16/04/2020**	**Primary**	-	ND	ND	0.53	0.08	3.49	-	ND	0.04	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.02**	4.16
	1302_MW195_201102	**2/11/2020**	**Primary**	-	ND	ND	0.06	ND	0.24	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.3**	0.3
MW197	**1302_MW197_170907**	**7/09/2017**	**Normal**	-	0.24	0.29	2.2	0.18	4.1	-	0.03	0.48	0.13	0.14	0.08	0.03	0.08	0.03	0.03	0.03	0.03	0.03	0.03	ND	0.03	0.02	ND	ND	ND	0.15	ND	ND	ND	ND	**6.3**	8.36
	1302_MW197_180111	**11/01/2018**	**Normal**	-	0.18	0.23	2.2	0.19	7.8	-	ND	0.39	0.08	0.11	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**10**	11.23
	1302_MW197_180308	**8/03/2018**	**Normal**	-	0.18	0.28	3	0.23	7.8	-	ND	0.53	0.12	0.15	0.05	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**10.8**	12.4
	1302_MW197_181214	**14/12/2018**	**Normal**	-	0.19	0.23	3.2	0.36	9.2	-	0.02	0.51	0.11	0.14	0.05	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**12.4**	14.07
	1302_MW197_190320	**20/03/2019**	**Normal**	0.11	0.24	0.25	2.7	0.22	6.7	0.03	ND	0.48	0.1	0.12	0.06	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.4**	11.06
	1302_MW197_200414	**16/04/2020**	**Primary**	-	0.34	0.33	3.75	0.24	6.16	-	ND	0.86	0.16	0.18	ND	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.91**	12.1
	1302_MW197_201103	**3/11/2020**	**Primary**	-	0.22	0.4	4.93	0.47	18.3	-	0.02	0.81	0.17	0.3	ND	ND	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**23.2**	25.7
MW200	**1302_MW200_170905**	**5/09/2017**	**Normal**	-	0.09	0.08	0.8	0.03	0.92	-	ND	0.1	0.02	0.03	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.72**	2.08
	1302_MW200_171117	**17/11/2017**	**Normal**	-	0.09	0.09	0.84	0.04	1.5	-	ND	0.11	0.02	0.03	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.34**	2.73
	1302_MW200_180115	**15/01/2018**	**Normal**	-	0.09	0.1	0.75	0.04	1.3	-	ND	0.1	0.02	0.03	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.05**	2.44
	1302_MW200_180307	**7/03/2018**	**Normal**	-	0.02	0.02	0.22	ND	0.4	-	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.62**	0.68
	1302_MW200_181213	**13/12/2018**	**Normal**	-	0.12	0.13	1.1	0.09	3	-	ND	0.16	0.03	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.1**	4.72
	1302_MW200_190321	**21/03/2019**	**Normal**	0.02	0.07	0.07	0.63	0.03	0.83	ND	ND	0.09	0.02	0.02	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.46**	1.79
	1302_MW200_191216	**16/12/2019**	**Normal**	-	0.07	0.07	0.63	0.04	0.92	-	ND	0.08	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.55**	1.83
	1302_MW200_200415	**16/04/2020**	**Primary**	-	0.06	0.05	0.58	0.04	1.23	-	ND	0.09	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.81**	2.07
	1302_MW200_201102	**2/11/2020**	**Primary**	-	0.06	0.08	0.6	0.03	0.97	-	ND	0.08	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.57**	1.84
MW205	**1302_MW205_171113**	**13/11/2017**	**Normal**	-	0.05	0.06	0.51	0.02	0.61	-	ND	0.04	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.12**	1.3
	1302_MW205_180112	**12/01/2018**	**Normal**	-	0.25	0.35	2.4	0.12	3.7	-	ND	0.33	0.08	0.1	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**6.1**	7.38
	1302_MW205_180306	**6/03/2018**	**Normal**	-	0.18	0.21	1.2	0.12	3.7	-	ND	0.27	0.06	0.09	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.9**	5.87
	1302_MW205_181215	**15/12/2018**	**Normal**	-	0.25	0.29	2.8	0.26	6.2	-	ND	0.45	0.1	0.14	ND	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9**	10.55
	1302_MW205_190320	**20/03/2019**	**Normal**	0.10	0.26	0.28	1.7	0.14	3.3	ND	ND	0.34	0.08	0.09	ND	ND	0.05	ND	ND	ND	ND	ND	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5**	6.4
	1302_MW205_191217	**17/12/2019**	**Normal**	-	0.04	0.04	0.37	0.02	0.62	-	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.99**	1.13
	1302_MW205_200414	**16/04/2020**	**Primary**	-	0.02	0.02	0.26	ND	0.39	-	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.65**	0.72
	1302_MW205_201103	**3/11/2020**	**Primary**	-	0.05	0.06	0.6	0.03	1.07	-	ND	0.05	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.67**	1.88
MW209	**1302_MW209_171117**	**17/11/2017**	**Normal**	-	0.01	0.01	0.14	ND	0.22	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.36**	0.38
	1302_MW209_180115	**15/01/2018**	**Normal**	-	0.01	0.01	0.1	ND	0.16	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.26**	0.28
	1302_MW209_180307	**7/03/2018**	**Normal**	-	ND	ND	0.09	ND	0.15	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.24**	0.24
	1302_MW209_181213	**13/12/2018**	**Normal**	-	0.01	0.02	0.17	ND	0.41	-	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.58**	0.86
	1302_MW209_190321	**21/03/2019**	**Normal**	ND	0.01	ND	0.1	ND	0.18	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.28**	0.3
	1302_MW209_191216	**16/12/2019**	**Normal**	-	ND	ND	0.14	ND	0.19	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.33**	0.33
	1302_MW209_200415	**16/04/2020**	**Primary**	-	ND	ND	0.13	ND	0.18	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.31**	0.31
	1302_MW209_201103	**3/11/2020**	**Priamry**	-	0.06	0.08	0.75	0.03	1.59	-	ND	0.13	0.03	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.34**	2.7
MW210	**1302_MW210_171116**	**16/11/2017**	**Normal**	-	0.06	0.08	0.91	0.08	3.4	-	ND	0.12	0.03	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.28	ND	**4.31**	5.05
	1302_MW210_180115	**15/01/2018**	**Normal**	-	0.07	0.1	0.78	0.04	1.8	-	ND	0.08	0.03	0.03	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.58**	2.95
	1302_MW210_180308	**8/03/2018**	**Normal**	-	0.03	0.04	0.42	0.02	1.1	-	ND	0.05	0.02	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.52**	1.7
	1302_MW210_181213	**13/12/2018**	**Normal**	-	0.01	0.01	0.23	0.02	2.7	-	ND	0.04	0.02	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.93**	3.05
	1302_MW210_190321	**21/03/2019**	**Normal**	0.01	0.05	0.06	0.63	0.03	1.3	ND	ND	0.07	0.02	0.03	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.93**	2.21
	1302_MW210_191216	**16/12/2019**	**Normal**	-	0.11	0.09	0.75	0.06	2.08	-	ND	0.11	0.03	0.04	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.83**	3.29
	1302_MW210_200415	**16/04/2020**	**Primary**	-	0.14	0.08	0.92	0.08	2.48	-	ND	0.15	0.03	0.05	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.4**	3.96
	1302_MW210_201102	**2/11/2020**	**Primary**	-	0.16	0.13	1.08	0.09	2.91	-	ND	0.15	ND	0.05	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.99**	4.6
MW211	**1302_MW211_171116**	**16/11/2017**	**Normal**	-	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_MW211_180115	**15/01/2018**	**Normal**	-	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_MW211_180308	**8/03/2018**	**Normal**	-	ND	ND	ND	ND	0.01	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	ND	ND	ND	ND
	1302_MW211_181213	**13/12/2018**	**Normal**	-	ND	ND	ND	ND	0.05	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND	ND	ND	ND
	1302_MW211_190321	**21/03/2019**	**Normal**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_MW211_191216	**16/12/2019**	**Normal**	-	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_MW211_200414	**16/04/2020**	**Primary**	-	ND	ND	ND	ND	ND	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_MW211_201103	**3/11/2020**	**Primary**	-	ND	ND	0.16	ND	0.27	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.43**	0.43

Table T4
PFAS Historical Groundwater Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

				PFAS																																						
				Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluorooctanoic acid (PFOA)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	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
				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	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
				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	0.01	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	0.05	0.02	0.05	0.01	0.01
Ecological Receptors	PFAS NEMP FW 99% Species Protection								0.00023					**19**																											
Human Health Receptors	NHMRC (2019) PFAS Recreational Water													10																										2	
	PFAS NEMP Human Health Drinking Water													**0.56**																										**0.07**	
Location Code	**Field ID**	**Date/Time**	**Sample Type**																																							
MW215	**1302_201_MW04_170422**	**22/04/2017**	**Normal**	-	0.54	0.6	5.5	0.26	7.4	-	ND	0.85	0.19	0.21	0.1	ND	0.16	ND	ND	ND	ND	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	**-**	-
	1302_201_MW04_170424	**24/04/2017**	**Normal**	-	0.47	0.57	4.5	0.22	6.1	-	ND	0.78	0.18	0.19	0.09	ND	0.14	ND	ND	ND	ND	ND	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	**-**	-
	1302_QC3GW_170424	**24/04/2017**	**Field_D**	-	-	-	-	-	0.21	-	-	-	-	ND	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	**-**	-
	1302_201_MW04-1_170808	**8/08/2017**	**Normal**	-	0.13	0.2	1.7	0.09	2.8	-	ND	0.28	0.12	0.08	0.05	ND	0.06	ND	ND	ND	ND	ND	ND	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.5**	5.6
	1302_201_MW04-3_170808	**8/08/2017**	**Normal**	-	0.15	0.22	1.8	0.11	2.9	-	ND	0.29	0.12	0.08	0.06	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.7**	5.79
	1302_201_MW04-5_170808	**8/08/2017**	**Normal**	-	0.18	0.26	2.2	0.12	3.3	-	ND	0.34	0.12	0.1	0.06	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5.5**	6.74
	1302_201_MW04_170828	**28/08/2017**	**Normal**	-	0.15	0.17	1.6	0.11	3.8	-	ND	0.29	0.11	0.07	0.06	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5.4**	6.42
	1302_201_MW04_171114	**14/11/2017**	**Normal**	-	0.11	0.15	1.4	0.08	3.6	-	ND	0.23	0.12	0.05	0.06	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5**	5.86
	1302_201_MW04_180111	**11/01/2018**	**Normal**	-	0.16	0.2	1.6	0.09	3.9	-	ND	0.29	0.11	0.07	0.05	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5.5**	6.53
	1302_201_MW04_180308	**8/03/2018**	**Normal**	-	0.25	0.47	3.3	0.2	6.6	-	ND	0.64	0.17	0.16	0.08	ND	0.1	ND	ND	ND	ND	ND	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.9**	12.03
	1302_201_MW04_181213	**13/12/2018**	**Normal**	-	0.13	0.17	1.7	0.1	3.9	-	ND	0.27	0.12	0.07	ND	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5.6**	6.52
	1302_201_MW04_190320	**20/03/2019**	**Normal**	0.05	0.19	0.27	2.1	0.19	3.6	0.01	ND	0.35	0.12	0.09	0.06	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5.7**	7.11
	1302_MW215_191216	**16/12/2019**	**Normal**	-	0.13	0.14	1.29	0.1	2.55	-	ND	0.24	0.1	0.05	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**3.84**	4.65
	1302_MW215_200414	**16/04/2020**	**Primary**	-	0.22	0.22	2.68	0.18	4.75	-	ND	0.43	0.12	0.11	ND	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.43**	8.79
	1302_MW215_201103	**3/11/2020**	**Primary**		0.24	0.28	2.62	0.19	5.2	-	ND	0.47	0.16	0.13	ND	ND	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**7.82**	9.38
MW240	**1302_243_MW02_170424**	**24/04/2017**	**Normal**	-	1.3	1.2	6.7	0.4	23	-	ND	4.9	2.2	**3.7**	1.5	0.1	3.3	ND	0.88	ND	ND	ND	ND	0.41	1.3	ND	ND	ND	ND	ND	ND	ND	ND	**-**	-
	1302_243_MW02_170822	**22/08/2017**	**Normal**	-	2.2	2.2	11	1.3	48	-	0.05	7	2.9	**5.5**	1.9	0.11	4.3	ND	1	ND	ND	0.01	ND	0.62	2	ND	ND	ND	ND	ND	ND	ND	ND	**59**	90.09
	1302_243_MW02_180112	**12/01/2018**	**Normal**	-	2.3	3.2	17	2.5	82	-	ND	9.6	3.9	**10**	2.3	0.15	6	ND	3.1	ND	ND	ND	ND	0.84	4.6	ND	ND	ND	ND	ND	ND	ND	ND	**99**	147.49
	1302_243_MW02C_180131	**31/01/2018**	**Normal**	-	3.7	3.6	40	3.1	63	-	ND	16	8.1	**16**	3.8	0.43	9.5	ND	3.5	ND	ND	0.01	ND	1.7	5.8	ND	ND	ND	ND	ND	ND	ND	ND	**103**	178.24
	1302_243_MW02B_180131	**31/01/2018**	**Normal**	-	4.8	3.8	44	3	63	-	ND	19	8.1	**16**	4.1	0.44	11	ND	3.7	ND	ND	ND	ND	1.9	7.2	ND	ND	ND	ND	ND	ND	ND	ND	**107**	190.04
	1302_243_MW02A_180131	**31/01/2018**	**Normal**	-	7.6	7.8	70	5.1	80	-	ND	29	30	**24**	5.9	0.36	21	ND	3.7	ND	ND	ND	0.01	2.1	5.1	ND	ND	ND	ND	ND	ND	ND	ND	**150**	291.67
	1302_243_MW02_180308	**8/03/2018**	**Normal**	-	1.6	0.76	10	1.3	29	-	0.06	7.3	3.8	**5.1**	2	0.11	4	ND	1.1	ND	ND	ND	ND	0.45	2.3	ND	ND	ND	ND	ND	ND	ND	ND	**39**	68.88
	1302_243_MW02_6_180508	**8/05/2018**	**Normal**	-	0.72	1.2	4	0.3	16	-	ND	3.2	1.6	**2.8**	1.1	0.07	2.6	ND	0.7	ND	ND	0.01	ND	0.2	0.89	ND	ND	ND	ND	ND	ND	ND	ND	**20**	35.39
	1302_243_MW02_10_180508	**8/05/2018**	**Normal**	-	1.2	2	5.7	0.47	20	-	ND	4.3	2.3	**3.2**	1.3	0.07	2.9	ND	0.75	ND	ND	0.01	ND	0.17	1	ND	ND	ND	ND	ND	ND	ND	ND	**25.7**	45.37
	1302_243_MW02_14_180508	**8/05/2018**	**Normal**	-	2.1	2.7	11	0.92	32	-	ND	6.8	3	**4.8**	1.8	0.09	3.8	ND	0.84	ND	ND	0.02	ND	0.31	1.4	ND	ND	ND	ND	ND	ND	ND	ND	**43**	71.58
	1302_243_MW02_190320	**20/03/2019**	**Normal**	0.25	0.89	1.2	4.3	0.7	18	0.28	ND	3.5	2	**3.1**	1.4	0.09	2.8	ND	0.84	ND	ND	ND	ND	0.19	0.96	ND	ND	ND	ND	ND	ND	ND	ND	**22.3**	40.5
	1302_243_MW03_170424	**24/04/2017**	**Normal**	-	0.91	0.82	5.3	0.41	18	-	ND	3.6	2.1	**3.2**	1.2	0.05	2.9	ND	0.66	ND	ND	ND	ND	0.33	0.59	ND	ND	ND	ND	ND	ND	ND	ND	**-**	-
	1302_MW240_200414	**16/04/2020**	**Primary**	-	1.34	0.91	10.5	0.6	24.6	-	0.1	4.98	2.2	**5.05**	1.2	0.22	3.24	0.08	0.94	ND	0.04	0.12	ND	0.51	2.37	ND	0.11	ND	ND	ND	ND	ND	ND	**35.1**	59.1
	1302_MW240_201103	**3/11/2020**	**Primary**	-	2.01	1.88	12.7	1.65	88.9	-	0.28	10.4	4.21	**8.4**	2.5	0.19	5.48	ND	1.61	ND	ND	ND	ND	0.83	3.21	ND	0.04	ND	ND	ND	ND	ND	ND	**102**	144
MW241	**1302_243_MW03_180112**	**12/01/2018**	**Normal**	-	0.74	0.91	5.5	0.56	23	-	ND	3	1.8	**2.9**	1	0.05	2.5	ND	0.66	ND	ND	ND	ND	0.25	0.82	ND	ND	ND	ND	ND	ND	ND	ND	**28.5**	43.69
	1302_243_MW03_180308	**8/03/2018**	**Normal**	-	0.99	0.61	6.7	0.78	17	-	ND	3.8	3.2	**3.6**	1.3	0.04	2.8	ND	0.68	ND	ND	ND	ND	0.3	0.82	ND	ND	ND	ND	ND	ND	ND	ND	**23.7**	42.62
	1302_243_MW03_190320	**20/03/2019**	**Normal**	0.18	0.64	0.72	3.4	0.39	8.9	0.05	ND	2.5	2.1	**2.5**	1.2	0.04	2.5	ND	0.57	ND	ND	ND	ND	0.13	0.39	ND	ND	ND	ND	ND	ND	ND	ND	**12.3**	26.21
	1302_MW241_200414	**16/04/2020**	**Primary**	-	0.43	0.28	2.68	0.23	8.44	-	ND	1.9	0.92	**1.55**	0.5	0.03	1.24	ND	0.34	ND	ND	ND	ND	0.12	0.31	ND	ND	ND	ND	ND	ND	ND	ND	**11.1**	19
	1302_MW241_201103	**3/11/2020**	**Primary**	-	0.55	0.72	6.3	0.62	15.7	-	ND	2.81	1.99	**2.63**	1.1	0.04	2.28	ND	0.62	ND	ND	ND	ND	ND	0.11	ND	ND	ND	ND	ND	ND	ND	ND	**22**	35.5
MW292	**1302_205_MW04_170427**	**27/04/2017**	**Normal**	-	1	0.96	12	1.6	85	-	ND	4.7	0.76	**1.3**	ND	ND	0.43	ND	ND	ND	ND	ND	ND	0.43	ND	ND	ND	ND	ND	ND	ND	ND	ND	**-**	-
	1302_DUP02_GW_170427	**27/04/2017**	**Field_D**	-	0.98	0.94	12	1.4	76	-	ND	4.4	0.7	**1.2**	ND	ND	0.4	ND	ND	ND	ND	ND	ND	0.33	ND	ND	ND	ND	ND	ND	ND	ND	ND	**-**	-
	1302_DUP02A_170427	**27/04/2017**	**Interlab_D**	-	0.93	1.16	8.76	1.66	67	-	ND	5.88	0.57	**1.12**	ND	ND	0.28	ND	0.02	ND	ND	ND	ND	0.15	0.07	ND	0.18	ND	ND	ND	ND	ND	ND	**75.8**	87.8
	1302_MW292_200414	**16/04/2020**	**Primary**	-	0.81	0.78	10.4	1.78	47.6	-	0.02	3.67	0.59	**0.89**	0.1	ND	0.33	ND	ND	ND	ND	ND	ND	0.16	ND	ND	0.04	ND	ND	ND	ND	ND	ND	**58**	67.2
	1302_MW292_201104	**4/11/2020**	**Primary**	-	0.84	1.12	9.87	1.09	49	-	0.1	3.5	0.35	**0.87**	ND	ND	0.33	ND	ND	ND	ND	ND	ND	0.26	ND	ND	0.05	ND	ND	ND	ND	ND	ND	**58.9**	67.4
MW297	**1302_206_MW05_170901**	**1/09/2017**	**Normal**	-	0.79	0.65	5	0.51	23	-	0.03	1.6	0.25	0.53	0.18	ND	0.22	ND	ND	ND	ND	ND	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	**28**	32.79
	1302_QC25MW_170901	**1/09/2017**	**Interlab_D**	-	0.59	0.45	3.46	0.34	12.9	-	ND	0.9	0.14	0.34	ND	ND	0.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**16.4**	19.2
	1302_206_MW05_190320	**20/03/2019**	**Normal**	0.05	0.14	0.12	1.1	0.09	4.7	0.06	0.01	0.32	0.07	0.11	0.06	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**5.8**	6.88
	1302_MW297_191216	**17/12/2019**	**Normal**	-	2.08	2.75	18.1	2.23	58.2	-	0.05	4.29	0.74	**1.31**	0.4	ND	0.67	ND	ND	ND	ND	ND	ND	0.06	0.08	ND	0.03	ND	ND	ND	ND	ND	ND	**76.3**	91
	1302_MW297_200414	**16/04/2020**	**Primary**	-	0.24	0.17	1.8	0.18	7.98	-	ND	0.51	0.07	0.15	ND	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.78**	11.2
	1302_MW297_201104	**4/11/2020**	**Primary**	-	0.48	0.68	5.03	0.5	25.6	-	0.06	1.16	0.14	0.49	0.1	ND	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**30.6**	34.4
MW303	**1302_207_MW04_170905**	**5/09/2017**	**Normal**	-	6.1	4.2	51	2.7	57	-	ND	11	2.3	**3.7**	1.4	ND	1.6	ND	0.03	ND	ND	ND	ND	0.11	0.03	ND	ND	ND	ND	ND	ND	ND	ND	**108**	141.17
	1302_QC36MW_170905	**5/09/2017**	**Field_D**	-	6.4	4.2	51	2.7	56	-	ND	11	2.4	**3.8**	1.5	ND	1.8	ND	0.03	ND	ND	ND	ND	0.11	0.02	ND	ND	ND	ND	ND	ND	ND	ND	**107**	140.96
	1302_207_MW04A_180125	**25/01/2018**	**Normal**	-	1.9	2.4	19	1.1	30	-	ND	4.2	0.88	**1.2**	0.54	ND	0.52	ND	0.01	ND	ND	ND	ND	0.09	0.02	ND	ND	ND	ND	ND	ND	ND	ND	**49**	61.86
	1302_207_MW04B_180125	**25/01/2018**	**Normal**	-	2	2.5	19	1.2	35	-	ND	4.3	0.97	**1.4**	0.57	ND	0.57	ND	0.01	ND	ND	ND	ND	0.09	0.02	ND	ND	ND	ND	ND	ND	ND	ND	**54**	67.63
	1302_207_MW04C_180125	**25/01/2018**	**Normal**	-	2.7	3.7	27	1.6	43	-	ND	5.9	1.2	**1.9**	0.74	ND	0.79	ND	0.02	ND	ND	ND	ND	0.1	0.02	ND	ND	ND	ND	ND	ND	ND	ND	**70**	88.67
	1302_207_MW04_181213	**13/12/2018**	**Normal**	-	6.4	6.4	48	2.5	81	-	0.07	10	2	**3.3**	1.2	ND	1.6	ND	0.02	ND	ND	ND	ND	0.14	0.03	ND	0.09	ND	ND	ND	ND	ND	ND	**129**	162.75
	1302_207_MW04_190320	**20/03/2019**	**Normal**	0.80	1.9	1.8	13	0.87	19	0.12	ND	3.5	0.67	**0.87**	0.53	ND	0.43	ND	ND	ND	ND	ND	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	**32**	43.56
	1302_MW303_200414	**16/04/2020**	**Primary**	-	2.67	2.46	19	1.55	27.7	-	ND	4.99	0.84	**1.22**	0.6	ND	0.56	ND	ND	ND	ND	ND	ND	0.07	ND	ND	0.02	ND	ND	ND	ND	ND	ND	**46.7**	61.7
	1302_MW303_201103	**3/11/2020**	**Primary**	-	5.84	7.24	46.1	3.48	84.8	-	ND	12.2	1.86	**3.12**	1	ND	1.52	ND	0.02	ND	ND	ND	ND	0.11	ND	ND	0.05	ND	ND	ND	ND	ND	ND	**131**	167
MW405	**1031MWBLD33-SOUTH_170824**	**24/08/2017**	**Normal**	-	0.21	0.22	2.7	0.15	6.6	-	ND	0.42	0.23	0.11	0.07	ND	0.09	ND	ND	ND	ND	ND	ND	0.36	ND	ND	ND	ND	ND	ND	ND	ND	ND	**9.3**	11.16
	1302_BLD33-STH_171113	**13/11/2017**	**Normal**	-	0.11	0.16	1.7	0.09	4.5	-	ND	0.31	0.23	0.08	0.07	ND	0.12	ND	ND	ND	ND	ND	ND	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	**6.2**	7.67
	1302_BLD33-STH_180112	**12/01/2018**	**Normal**	-	0.45	0.59	6.2	0.53	36	-	ND	0.99	0.34	0.35	0.14	ND	0.22	ND	0.01	ND	ND	ND	ND	0.21	ND	ND	ND	ND	ND	ND	ND	ND	ND	**42.2**	46.03
	1301_BLD33_SOUTGB_180202	**2/02/2018**	**Normal**	-	0.34	0.41	4.9	0.69	13	-	ND	0.75	0.14	0.28	0.08	ND	0.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**17.9**	20.7
	1301_BLD33_SOUTGA_180202	**2/02/2018**	**Normal**	-	0.38	0.44	5.1	0.75	12	-	ND	0.8	0.16	0.29	0.09	ND	0.13	ND	ND	ND	ND	ND	ND	0.07	0.03	ND	ND	ND	ND	ND	ND	ND	ND	**17.1**	20.24
	1301_BLD33_SOUTGC_180202	**2/02/2018**	**Normal**	-	0.25	0.36	4	0.32	9.9	-	ND	0.5	0.15	0.2	0.09	ND	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**13.9**	15.86
	1302_BLD33_STH_180306	**6/03/2018**	**Normal**	-	0.06	0.07	0.63	0.05	1.4	-	0.01	0.1	0.02	0.04	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	**2.03**	2.4
	1302_BLD33_STH_181215	**15/12/2018**	**Normal**	-	0.22	0.26	2.7	0.4	8.1	-	ND	0.54	0.26	0.14	0.1	ND	0.13	ND	ND	ND	ND	ND	ND	0.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	**10.8**	13.15
	1302_BLD33_SOUTH_190320	**20/03/2019**	**Normal**	0.29	0.84	1.3	6.7	0.62	28	0.17	ND	1.2	0.28	0.36	0.2	ND	0.21	ND	ND	ND	ND	ND	ND	0.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	**34.7**	40.32
	1302_MW405_191217	**17/12/2019**	**Normal**	-	0.11	0.1	1.24	0.11	3.48	-	ND	0.29	0.2	0.06	ND	ND	0.08	ND	ND	ND	ND	ND	ND	0.28	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4.72**	5.95
	1302_MW405_200414	**16/04/2020**	**Primary**		0.76	0.66	6.07	0.56	16.7	-	ND	1.11	0.25	0.33	0.1	ND	0.17	ND	ND	ND	ND	ND	ND	0.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	**22.8**	26.8
	1302_MW405_201103			Did not sample, wwell destroyed																																						
MW422	**1302_MW422_191217**	**17/12/2019**	**Normal**	-	3.73	4.26	18.2	2.11	41	-	ND	5.42	1.68	**1.04**	1	ND	0.65	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**59.2**	79.1
	1302_MW422_200414	**16/04/2020**	**Primary**	-	4.34	4.08	30	1.92	51.6	-	0.03	7.68	1.65	**1.51**	0.9	ND	0.88	ND	0.03	ND	ND	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	**81.6**	105
	1302_MW422_201102	**2/11/2020**	**Primary**	-	3.35	4.79	23.2	2.16	51.1	-	ND	7.16	1.38	**1.31**	0.9	ND	0.83	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**74.3**	96.2
MW189	**1302_MW189_170905**	**5/09/2017**	**Normal**	-	ND	ND	0.05	ND	0.03	-	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.08**	0.1
	1302_MW189_180309	**8/03/2018**	**Normal**	-	ND	ND	0.02	ND	0.03	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND
	1302_MW189_200417	**17/04/2020**	**Primary**	-	ND	ND	0.04	ND	0.06	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.1**	0.1
	Did not sample, contingency well sampled (MW185)																																							

Table T5
Non-PFAS Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

		DOC	Inorganics													Metals		
		Dissolved Organic Carbon	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Fluoride	Ionic Balance	Sodium (Filtered)	Sulfate as SO4 - Turbidimetric (Filtered)	TSS	Calcium (Filtered)	Magnesium (Filtered)	Potassium (Filtered)
		mg/L	mg/L	mg/L	µg/L	mg/L	meq/L	meq/L	mg/L	mg/L	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	PQL	1	1	1	1000	1	0.01	0.01	1	0.1	0.01	1	1	5	1	1	1
Location ID	**Field ID**	**Sampled_Date_Time**	**Sample Type**	**Lab Report Number**														
MW103	1302_MW103_201102	2/11/2020	Primary	ES2039162	2	54	<1	<1000	54	1.31	0.99	6	<0.1	-	6	3	440	8	4	<1
MW148	1302_MW148_201103	3/11/2020	Primary	ES2039162	<1	2	<1	<1000	2	0.35	0.13	11	<0.1	-	3	<1	562	<1	<1	<1
MW176	1302_MW176_201104	4/11/2020	Primary	ES2039162	1	6	<1	<1000	6	0.34	0.27	8	<0.1	-	4	<1	803	2	<1	<1
MW185	1302_MW185_201102	2/11/2020	Primary	ES2039162	5	107	<1	<1000	107	7.39	4.86	162	0.4	20.7	78	33	7540	8	12	3
MW191	1302_MW191_201103	3/11/2020	Primary	ES2039162	5	7	<1	<1000	7	0.28	0.22	5	<0.1	-	5	<1	909	<1	<1	<1
MW194	1302_MW194_201102	2/11/2020	Primary	ES2039162	<1	4	<1	<1000	4	0.16	0.13	3	<0.1	-	3	<1	156	<1	<1	<1
MW209	1302_MW209_201103	3/11/2020	Primary	ES2039162	<1	21	<1	<1000	21	9.12	7.88	273	<0.1	7.29	125	48	18,900	19	16	7
MW211	1302_MW211_201103	3/11/2020	Primary	ES2039162	<1	5	<1	<1000	5	0.3	0.22	7	<0.1	-	5	<1	177	<1	<1	<1
MW292	1302_MW292_201104	4/11/2020	Primary	ES2039162	45	43	<1	<1000	43	0.94	0.26	3	<0.1	-	3	<1	187	1	1	<1
MW303	1302_MW303_201103	3/11/2020	Primary	ES2039162	5	11	<1	<1000	11	0.42	0.34	7	<0.1	-	4	<1	2350	<1	2	<1
MW303	1302_QC103_201103	3/11/2020	Intralab duplicate	ES2039162	8	28	<1	<1000	28	0.76	0.34	7	0.1	-	4	<1	348	<1	2	<1

Notes:
PQL: Practical Quantitation Limits
mg/L: milligram per Litre
µg/L: micrograms per Litre
meq/L: milliequivalents per Litre
%: Percentage

27/04/2021
Checked By: Kim Treglown
27/04/2021

Table T6
Field Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

Well ID	Date	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Redox (mV)	Redox (corr) (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method
SW112	16/12/2020	2.5	2877	1870.1	7.8	159.2	359.2	27.7	Clear	Colourless	Freshwater Odour	No Sheen	Sampling Pole
SW113	16/12/2020	3.0	23991	15594.2	7.1	190.1	390.1	28.7	Clear	Colourless	Slightly Saline	No Sheen	Sampling Pole
SW125	16/12/2020	4.2	1120	728	8.2	127	327	30.8	Clear	Slight Brown	Odourless	No Sheen	Sampling Pole
SW120	16/12/2020	3.1	20304	13197.6	7.3	151.2	351.2	28.4	Clear	Very Slight Brown	Slightly Saline	No Sheen	Sampling Pole
SW124	16/12/2020	5.7	44573	28972.5	7.4	147.2	347.2	29.7	Clear	Slight Brown	Odourless	No Sheen	Sampling Pole
SW114	16/12/2020	4.0	75.2	48.9	8.1	130.8	330.8	29.9	Clear	Colourless	Slightly Organic	No Sheen	Sampling Pole
SW104	16/12/2020	3.6	23.3	15.1	8	150.5	350.5	29.3	Clear	Colourless	Odourless	No Sheen	Sampling Pole
SW115	16/12/2020	4.9	19.5	12.7	7.7	146.1	346.1	28.8	Clear	Colourless	Slightly Organic	No Sheen	Sampling Pole
SW106	16/12/2020	3.4	52.7	34.3	7.2	164.6	364.6	28.6	Clear	Colourless	Odourless	No Sheen	Sampling Pole
SW108	16/12/2020	4.7	42.4	27.6	7	178.1	378.1	28	Clear	Colourless	Odourless	No Sheen	Sampling Pole
SW109	16/12/2020	4.0	39.4	25.6	6.5	187.7	387.7	28.6	Clear	Colourless	Slightly Organic	No Sheen	Sampling Pole
SW168	16/12/2020	4.0	29	18.9	6.4	189.2	389.2	30.2	Clear	Brown/Orange	Slightly Metallic	No Sheen	Sampling Pole
SW132	17/12/2020	2.9	53.1	34.5	7.5	164.9	364.9	27.2	Clear	Colourless	Odourless	No Sheen	Sampling Pole
SW133	17/12/2020	2.9	465	302.3	9.6	93.4	293.4	28.8	Clear	Colourless	Slight Unknown	No Sheen	Sampling Pole
SW143	17/12/2020	3.9	19006	12353.9	8.1	147.7	347.7	30.4	Clear	Colourless	Odourless	No Sheen	Sampling Pole
SW170	20/01/2021	2.8	170.6	110.9	7.4	-	-	29.0	Slightly Turbid	Slight Grey Brown	Odourless	No Sheen	Sampling Pole
SW162	20/01/2021	3.7	26.9	17.5	7.7	-	-	28.5	Slightly Turbid	Colourless	Odourless	No Sheen	Sampling Pole
SW181	20/01/2021	3.8	170.6	110.9	7.4	-	-	7.9	Slightly Turbid	Colourless	Slightly Organic	No Sheen	Sampling Pole
SW160	-	**Location was to dry to sample**											
SW156	-	**Location was to dry to sample**											
SW178	20/01/2021	3.1	45.8	29.8	7.9	124.4	324.4	27.5	Slightly Turbid	Colourless	Lightly Organic	No Sheen	Sampling Pole
SW101	-	**Could not access location to gain a sample**											

Notes:
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
^{o}C: degrees celcius

Table T7
PFAS Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

AECOM

					PFAS Full Suite																													
					10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	Perfluorobutane sulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanesulfonic acid (PFDS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (FOSA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Sum of PFAS	Sum of PFHxS and PFOS	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorohexane sulfonic acid (PFHxS)
					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
	PQL				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.02
PFAS NEMP FW 99% Species Protection																																0.00023	19	
NHMRC (2019) PFAS Recreational Water																															**2**		**10**	
PFAS NEMP Human Health Drinking Water																															**0.07**		**0.56**	
Location Code	**Field ID**	**Sampled Date**	**Lab Report Number**	**Sample Type**																														
BIOFA018	1302_SW007_201103	3/11/2020	ES2040589	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02
	1302_QC121_201103	3/11/2020	ES2040589	Intra-laboratory Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
BIOFA007	1302_SW008_201104	4/11/2020	ES2040589	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.1	**0.1**	0.07	<0.01	0.03
BIOFA016	1302_SW009_201103	3/11/2020	ES2040589	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	1.36	**1.24**	0.94	0.02	0.3
BIOFA028	1302_SW010_201107	7/11/2020	ES2040589	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	1.31	**1.15**	0.82	0.02	0.33
BIOFA026	1302_SW011_201107	7/11/2020	ES2040589	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	0.74	**0.65**	0.45	0.01	0.2
BIOFA024	1302_SW012_201107	7/11/2020	ES2040589	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.5	**0.46**	0.32	<0.01	0.14
SW104	1302_SW104_201216	16/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.02	0.02	0.02	<0.01	<0.02
	1302_QC100_201216	16/12/2020	ES2045380	Intra-laboratory Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02
	1302_QC200_201216	16/12/2020	RN1299485	Inter-laboratory Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02
SW106	1302_SW106_201216	16/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.94	**0.8**	0.52	0.01	0.28
SW108	1302_SW108_201216	16/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	0.63	**0.55**	0.35	<0.01	0.2
SW109	1302_SW109_201216	16/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.53	**0.49**	0.31	<0.01	0.18
	1302_QC101_201216	16/12/2020	ES2045380	Intra-laboratory Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.49	**0.44**	0.28	0.01	0.16
	1302_QC201_201216	16/12/2020	RN1299485	Inter-laboratory Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.011	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.022	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.34	**0.31**	0.19	<0.01	0.12
SW112	1302_SW112_201216	16/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	1.15	**0.96**	0.63	0.02	0.33
SW113	1302_SW113_201216	16/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.24	**0.22**	0.13	<0.01	0.09
SW114	1302_SW114_201216	16/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02
SW115	1302_SW115_201216	16/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02
SW120	1302_SW120_201216	16/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	0.66	**0.58**	0.35	<0.01	0.23
SW124	1302_SW124_201216	16/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.09	**0.09**	0.06	<0.01	0.03
SW125	1302_SW125_201216	16/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	0.03	<0.02	<0.02	0.08	0.03	0.22	<0.02	<0.02	0.15	0.06	<0.05	<0.02	<0.02	4.95	**4.21**	2.82	0.06	1.39
SW168	1302_SW168_201216	16/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.34	**0.34**	0.27	<0.01	0.07
SW132	1302_SW132_201217	17/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.11	**0.11**	0.07	<0.01	0.04
SW133	1302_SW133_201217	17/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	0.02	0.04	<0.02	<0.02	<0.02	0.05	<0.05	<0.02	<0.02	0.22	**0.1**	0.05	0.01	0.05
SW143	1302_SW143_201217	17/12/2020	ES2045380	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.4	**0.37**	0.23	<0.01	0.14
SW162	1302_SW162_201218	18/12/2020	ES2101132	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.05	**0.05**	0.05	<0.01	<0.02
SW181	1302_SW181_201218	18/12/2020	ES2101132	Primary	<0.05	<0.05	0.09	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.47	**0.38**	0.35	<0.01	0.03
	1302_QC102_201218	18/12/2020	ES2101132	Intra-laboratory Duplicate	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.05	<0.02	<0.02	0.47	**0.37**	0.34	<0.01	0.03
	1302_QC202_201218	18/12/2020	ES2101132	Intra-laboratory Duplicate	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.05	<0.02	<0.02	0.48	**0.38**	0.35	<0.01	0.03
SW170	1302_SW170_210120	20/01/2021	ES2102255	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.33	**0.33**	0.24	<0.01	0.09
	1302_QC100_210120	20/01/2021	ES2102255	Intra-laboratory Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.36	**0.36**	0.25	<0.01	0.11
	1302_QC200_210120	20/01/2021	RN1302294	Inter-laboratory Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.23	**0.23**	0.16	<0.01	0.066
SW162	1302_SW162_201220	20/01/2021	ES2102255	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.04	**0.04**	0.04	<0.01	<0.02
SW181	1302_SW181_210120	20/01/2021	ES2102255	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.19	**0.19**	0.19	<0.01	<0.02
SW178	1302_SW178_210120	20/01/2021	ES2102255	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.01	**0.01**	0.01	<0.01	<0.02

Notes:
PQL: Practical Quantification Limit
µg/L: micrograms per Litre

Table T8
PFAS Historical Surface Water Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

				PFAS																																			
				Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluorooctanoic acid (PFOA)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	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
				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	µg/L	µg/L	µg/L	µg/L	µg/L
				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	0.01	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	0.05	0.02	0.05	0.01	0.01
Ecological Receptors	**PFAS NEMP FW 99% Species Protection**								0.00023					19																									
Human Health Receptors	**NHMRC (2019) PFAS Recreational Water**													10																								2	
	PFAS NEMP Human Health Drinking Water													**0.56**																								**0.07**	
Location Code	**Field ID**	**Date/Time**	**Sample Type**																																				
SW101	**1302_SW101_171207**	**7/12/2017**	**Primary**	ND	ND	ND	0.05	ND	0.11	ND	ND	0.01	ND	ND	ND	ND	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.16**	0.22
	1302_SW101_180108	**8/01/2018**	**Primary**	ND	ND	ND	0.04	ND	0.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.18**	0.18
	1302_SW101_180307	**7/03/2018**	**Primary**	ND	ND	ND	0.03	ND	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.12**	0.16
	1302_SW101_181211	**11/12/2018**	**Primary**	ND	ND	ND	0.05	ND	0.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.23**	0.23
	1302_SW101_190319	**19/03/2019**	**Primary**	ND	ND	ND	0.03	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.11**	0.11
	1302_SW101_190319	**19/03/2019**	**Primary**	ND	ND	ND	0.03	ND	0.09	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.12**	0.15
				Did not sample due to inability to re-schedule access with Defence																																			
SW104	**1302_SW104_180109**	**9/01/2018**	**Primary**	ND	0.06	0.06	0.51	0.02	1.1	ND	ND	0.06	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.61**	1.83
	1302_SW104_180309	**9/03/2018**	**Primary**	ND	0.03	0.04	0.23	0.01	0.47	ND	ND	0.05	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.7**	0.85
	1302_SW104_181211	**11/12/2018**	**Primary**	ND	0.09	0.09	0.74	0.03	1.1	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.84**	2.08
	1302_SW104_190318	**18/03/2019**	**Primary**	ND	ND	ND	0.05	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.12**	0.12
	1302_SW104_190318	**18/03/2019**	**Primary**	ND	ND	ND	0.05	ND	0.07	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.12**	0.14
	1302_SW104_200122	**21/01/2020**	**Primary**	ND	0.06	0.07	0.56	0.03	1.26	ND	ND	0.11	0.02	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.82**	2.13
	1302_SW104_200415	**16/04/2020**	**Primary**	ND	0.2	0.19	1.49	0.1	2.08	ND	ND	0.29	0.06	0.07	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.57	4.5
	1302_SW104_201216	**16/12/2020**	**Primary**	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	0.02
SW106	**RC2_SW002_170404**	**4/04/2017**	**Primary**	ND	0.03	0.03	0.33	0.02	0.65	ND	ND	0.08	0.02	0.02	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.98**	1.19
	1302_SWRC07_170426	**26/04/2017**	**Primary**	ND	0.04	0.04	0.36	0.02	0.65	ND	ND	0.08	0.02	0.03	ND	ND	0.01	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SWRC07_20170629	**29/06/2017**	**Primary**	ND	0.04	0.04	0.28	0.02	0.52	ND	ND	0.06	0.02	0.01	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_QC1SW_20170629	**29/06/2017**	**Field_D**	ND	0.03	0.03	0.28	0.01	0.54	ND	ND	0.06	0.02	0.01	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW106_170726	**26/07/2017**	**Primary**	ND	0.03	0.03	0.21	ND	0.35	ND	ND	0.05	0.01	0.01	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.56**	0.7
	1302_SW106_171024	**24/10/2017**	**Primary**	ND	ND	ND	0.04	ND	0.14	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.18**	0.18
	1302_SW106_171118	**18/11/2017**	**Primary**	ND	0.02	0.01	0.12	ND	0.08	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.2**	0.25
	1302_SW106_171205	**5/12/2017**	**Primary**	ND	0.03	0.03	0.24	ND	0.37	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.61**	0.7
	1302_SW106_180109	**9/01/2018**	**Primary**	ND	0.02	0.02	0.22	0.01	0.4	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.62**	0.7
	1302_SW106_180216	**16/02/2018**	**Primary**	ND	0.02	0.02	0.21	0.01	0.61	ND	ND	0.04	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.82**	0.92
	1302_SW106_180222	**22/02/2018**	**Primary**	ND	0.02	0.02	0.25	ND	0.74	ND	ND	0.05	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.99**	1.1
	1302_SW106_180301	**1/03/2018**	**Primary**	ND	0.02	0.03	0.2	0.01	0.54	ND	ND	0.05	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.74**	0.87
	1302_SW106_180308	**8/03/2018**	**Primary**	ND	0.03	0.03	0.25	0.02	0.62	ND	ND	0.05	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.87**	1.02
	1302_SW106_180321	**21/03/2018**	**Primary**	ND	0.06	0.08	0.39	0.02	0.86	ND	ND	0.1	0.04	0.04	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.25**	1.61
	1302_SW106_180329	**29/03/2018**	**Primary**	ND	0.03	0.03	0.29	0.02	0.61	ND	ND	0.06	0.01	0.02	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.9**	1.08
	1302_SW106_181211	**11/12/2018**	**Primary**	ND	0.02	0.02	0.16	ND	0.27	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.43**	0.5
	1302_SW106_190319	**19/03/2019**	**Primary**	ND	0.03	0.02	0.22	0.01	0.42	ND	ND	0.05	0.02	0.01	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.64**	0.79
	1302_SW106_190319	**19/03/2019**	**Primary**	ND	0.03	0.03	0.21	ND	0.35	ND	ND	0.08	0.03	0.02	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.56**	0.76
	1302_QCSW04_190319	**19/03/2019**	**Field_D**	ND	0.03	0.02	0.21	ND	0.37	ND	ND	0.08	0.03	0.02	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.58**	0.77
	1302_SW106_191115	**15/11/2019**	**Primary**	ND	ND	ND	0.18	ND	0.23	ND	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.41**	0.47
	1302_SW106_200121	**21/01/2020**	**Primary**	ND	0.02	0.02	0.19	ND	0.43	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.62**	0.69
	1302_SW106_200415	**16/04/2020**	**Primary**	ND	0.03	0.03	0.24	ND	0.41	ND	ND	0.04	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.65**	0.76
	1302_SW106_201216	**16/12/2020**	**Primary**	ND	0.03	0.03	0.28	ND	0.52	ND	ND	0.07	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.8**	0.94

Table T8
PFAS Historical Surface Water Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

				PFAS																																			
				Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluorooctanoic acid (PFOA)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	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
				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	µg/L	µg/L	µg/L	µg/L	µg/L
				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	0.01	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	0.05	0.02	0.05	0.01	0.01
Ecological Receptors	**PFAS NEMP FW 99% Species Protection**								0.00023					19																									
Human Health Receptors	**NHMRC (2019) PFAS Recreational Water**													10																								2	
	PFAS NEMP Human Health Drinking Water													**0.56**																								**0.07**	
SW108	**1302_SWRC08_170426**	**26/04/2017**	**Primary**	ND	0.04	0.03	0.37	0.02	0.66	ND	ND	0.07	0.02	0.02	ND	ND	0.01	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SWRC08_20170629	**29/06/2017**	**Primary**	ND	0.04	0.04	0.33	0.02	0.58	ND	ND	0.06	0.02	0.02	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW108_170726	**26/07/2017**	**Primary**	ND	0.04	0.04	0.31	0.02	0.57	ND	ND	0.06	0.02	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.88**	1.08
	1302_SW108_171024	**24/10/2017**	**Primary**	ND	0.05	0.05	0.38	0.02	0.89	ND	ND	0.09	0.02	0.03	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.27**	1.54
	1302_SW108_171114	**14/11/2017**	**Primary**	ND	0.03	0.03	0.26	0.01	0.25	ND	ND	0.03	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.51**	0.63
	1302_SW108_171205	**5/12/2017**	**Primary**	ND	0.03	0.03	0.26	ND	0.42	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.68**	0.77
	1302_SW108_180109	**9/01/2018**	**Primary**	ND	0.03	0.03	0.25	0.01	0.49	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.74**	0.84
	1302_SW108_180308	**8/03/2018**	**Primary**	ND	0.03	0.03	0.25	0.02	0.59	ND	ND	0.05	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.84**	0.99
	1302_SW108_181211	**11/12/2018**	**Primary**	ND	0.03	0.03	0.22	0.01	0.42	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.64**	0.75
	1302_SW108_190319	**19/03/2019**	**Primary**	ND	0.03	0.03	0.25	0.01	0.43	ND	ND	0.05	0.01	0.01	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.68**	0.83
	1302_SW108_190319	**19/03/2019**	**Primary**	ND	0.03	0.03	0.23	ND	0.39	ND	ND	0.08	0.02	0.02	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.62**	0.81
	1302_SW108_200121	**21/01/2020**	**Primary**	ND	0.02	0.02	0.17	ND	0.37	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.54**	0.61
	1302_SW108_200415	**16/04/2020 11:25:00AI**	**Primary**	ND	0.03	0.03	0.26	ND	0.46	ND	ND	0.04	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.72**	0.83
	1302_SW108_201216	**16/12/2020**	**Primary**	ND	0.02	0.02	0.2	ND	0.35	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.55**	0.63
SW109	**1302_SWRC09_170426**	**26/04/2017**	**Primary**	ND	0.04	0.04	0.38	0.02	0.78	ND	ND	0.08	0.02	0.03	ND	ND	0.01	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SWRC09_20170629	**29/06/2017**	**Primary**	ND	0.07	0.06	0.56	0.03	1.1	ND	ND	0.11	0.03	0.03	ND	ND	0.01	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW109_170726	**26/07/2017**	**Primary**	ND	0.06	0.06	0.46	0.02	0.84	ND	ND	0.08	0.02	0.02	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.3**	1.57
	1302_SW109_171024	**24/10/2017**	**Primary**	ND	0.1	0.1	0.88	0.04	1.6	ND	ND	0.2	0.06	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.48	3.07
	1302_SW109_171207	**7/12/2017**	**Primary**	ND	0.04	0.06	0.35	0.02	0.63	ND	ND	0.05	0.01	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.98**	1.18
	1302_SW109_180109	**9/01/2018**	**Primary**	ND	0.03	0.03	0.29	0.01	0.59	ND	ND	0.04	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.88**	1
	1302_SW109_180215	**15/02/2018**	**Primary**	ND	0.02	0.02	0.15	ND	0.47	ND	ND	0.03	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.62**	0.7
	1302_SW109_180222	**22/02/2018**	**Primary**	ND	0.02	0.02	0.25	ND	0.78	ND	ND	0.05	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.03**	1.14
	1302_SW109_180301	**1/03/2018**	**Primary**	ND	0.02	0.03	0.19	0.01	0.54	ND	ND	0.05	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.73**	0.86
	1302_SW109_180308	**8/03/2018**	**Primary**	ND	0.03	0.03	0.26	0.02	0.61	ND	ND	0.05	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.87**	1.02
	1302_SW109_180321	**21/03/2018**	**Primary**	ND	0.05	0.08	0.35	0.02	0.82	ND	ND	0.1	0.03	0.04	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.17**	1.51
	1302_SW109_180329	**29/03/2018**	**Primary**	ND	0.03	0.03	0.28	0.02	0.55	ND	ND	0.06	0.01	0.02	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.83**	1.01
	1302_SW109_181211	**11/12/2018**	**Primary**	ND	0.05	0.05	0.46	0.02	0.81	ND	ND	0.07	0.02	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.27**	1.5
	1302_SW109_190319	**19/03/2019**	**Primary**	ND	0.03	0.03	0.29	0.02	0.51	ND	ND	0.06	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.8**	0.96
	1302_SW109_190319	**19/03/2019**	**Primary**	ND	0.03	0.03	0.25	ND	0.43	ND	ND	0.1	0.03	0.02	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.68**	0.9
	1302_SW109_191115	**15/11/2019**	**Primary**	ND	0.06	0.07	0.66	0.03	0.71	ND	ND	0.16	0.02	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.37**	1.74
	1302_SW109_200121	**21/01/2020**	**Primary**	ND	0.02	0.02	0.19	ND	0.35	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.54**	0.61
	1302_SW109_200415	**16/04/2020**	**Primary**	ND	0.3	0.28	0.52	0.29	0.64	ND	0.26	0.34	0.26	0.25	1.2	0.27	0.27	0.27	0.26	0.76	0.24	0.26	0.25	0.26	0.24	0.32	0.27	0.57	0.31	0.74	0.68	0.28	0.68	**1.16**	11.3
	1302_SW109_201216	**16/12/2020**	**Primary**	ND	ND	ND	0.18	ND	0.31	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.49**	0.53
SW112	**1302_SWRC12_170426**	**26/04/2017**	**Primary**	ND	0.02	0.02	0.17	0.01	0.26	ND	ND	0.03	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW112_170726	**26/07/2017**	**Primary**	ND	ND	ND	0.05	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.09**	ND
	1302_SW112_171024	**24/10/2017**	**Primary**	ND	ND	ND	0.03	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.06	ND
	1302_QC03SW_171024	**24/10/2017**	**Field_D**	ND	ND	ND	0.03	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND
	1302_SW112_171116	**16/11/2017**	**Primary**	ND	0.03	0.03	0.22	ND	0.18	ND	ND	0.03	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.4**	0.51
	1302_SW112_171205	**5/12/2017**	**Primary**	ND	ND	ND	0.07	ND	0.07	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.14**	0.15
	1302_SW112_180109	**9/01/2018**	**Primary**	ND	ND	ND	0.05	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.13**	0.13
	1302_SW112_180307	**7/03/2018**	**Primary**	ND	0.03	0.03	0.25	0.02	0.66	ND	ND	0.05	0.01	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.91**	1.07
	1302_SW112_181211	**11/12/2018**	**Primary**	ND	ND	ND	0.05	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.08**	ND
	1302_SW112_190319	**19/03/2019**	**Primary**	ND	0.03	0.03	0.28	0.01	0.5	ND	ND	0.05	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.78**	0.92
	1302_SW112_190319	**19/03/2019**	**Primary**	ND	0.03	0.03	0.25	ND	0.45	ND	ND	0.1	0.03	0.02	ND	ND	0.01	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.7**	0.93
	1302_SW112_200121	**21/01/2020**	**Primary**	ND	ND	ND	0.12	ND	0.22	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.34**	0.36
	1302_SW112_200415	**16/04/2020**	**Primary**	ND	0.04	0.03	0.27	ND	0.43	ND	ND	0.04	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.7**	0.82
	1302_SW112_201216	**16/12/2020**	**Primary**	ND	0.04	0.03	0.33	0.02	0.63	ND	ND	0.08	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.96**	1.15

Table T8
PFAS Historical Surface Water Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

				PFAS																																			
				Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluorooctanoic acid (PFOA)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	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
				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	µg/L	µg/L	µg/L	µg/L	µg/L
				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	0.01	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	0.05	0.02	0.05	0.01	0.01
Ecological Receptors	**PFAS NEMP FW 99% Species Protection**								0.00023					19																									
Human Health Receptors	**NHMRC (2019) PFAS Recreational Water**													10																								2	
	PFAS NEMP Human Health Drinking Water													**0.56**																								**0.07**	
SW113	**1302_SWRC13_170426**	**26/04/2017**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW113_170726	**26/07/2017**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW113_171024	**24/10/2017**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW113_171120	**20/11/2017**	**Primary**	ND	ND	ND	0.02	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND
	1302_QC4SW_171120	**20/11/2017**	**Field_D**	ND	ND	ND	0.02	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND
	1302_SW113_171205	**5/12/2017**	**Primary**	ND	ND	ND	0.03	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.08**	ND
	1302_SW113_180109	**9/01/2018**	**Primary**	ND	ND	ND	0.04	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.12**	0.12
	1302_QCSW11_180109	**9/01/2018**	**Field_D**	ND	ND	ND	0.04	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.12**	0.12
	1302_SW113_180307	**7/03/2018**	**Primary**	ND	0.02	0.02	0.16	ND	0.38	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.54**	0.61
	1302_SW113_181211	**11/12/2018**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW113_190319	**19/03/2019**	**Primary**	ND	0.01	0.01	0.1	ND	0.14	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.24**	0.28
	1302_SW113_190319	**19/03/2019**	**Primary**	ND	0.01	0.01	0.1	ND	0.14	ND	ND	0.04	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.24**	0.31
	1302_SW113_191113	**13/11/2019**	**Primary**	ND	ND	ND	0.02	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04	0.04
	1302_SW113_200122	**22/01/2020**	**Primary**	ND	ND	ND	0.05	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.13**	0.13
	1302_SW113_200415	**16/04/2020**	**Primary**	ND	ND	ND	0.11	ND	0.18	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.29**	0.29
	1302_SW113_201216	**16/12/2020**	**Primary**	ND	ND	ND	0.09	ND	0.13	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.22**	0.24
SW114	**1302_SW114_171024**	**24/10/2017**	**Primary**	ND	ND	ND	0.01	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND
	1302_SW114_171205	**5/12/2017**	**Primary**	ND	0.05	0.05	0.52	0.03	0.99	ND	ND	0.09	0.02	0.02	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.51**	1.78
	1302_SW114_180109	**9/01/2018**	**Primary**	ND	0.04	0.04	0.36	0.02	0.77	ND	ND	0.05	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.13**	1.29
	1302_QCSW08_180109	**9/01/2018**	**Field_D**	ND	0.04	0.04	0.34	0.01	0.77	ND	ND	0.05	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.11**	1.26
	1302_SW114_180308	**8/03/2018**	**Primary**	ND	0.18	0.21	1.7	0.11	4.3	ND	ND	0.39	0.08	0.09	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	7.1
	1302_SW114_181211	**11/12/2018**	**Primary**	ND	0.04	0.03	0.33	0.02	0.66	ND	ND	0.05	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.99**	1.15
	1302_SW114_190319	**19/03/2019**	**Primary**	0.02	0.06	0.06	0.68	0.04	1.7	ND	ND	0.17	0.04	0.04	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.38	2.83
	1302_SW114_190319	**19/03/2019**	**Primary**	0.01	0.06	0.06	0.6	0.04	1.4	ND	ND	0.3	0.08	0.05	0.07	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2	2.69
	1302_SW114_200121	**21/01/2020**	**Primary**	ND	ND	ND	0.08	ND	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.17**	0.17
	1302_SW114_200415	**16/04/2020**	**Primary**	ND	0.11	0.11	0.95	0.08	2.08	ND	ND	0.27	0.05	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.03	3.74
	1302_SW114_201216	**16/12/2020**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SW115	**1302_SW001_20170629**	**29/06/2017**	**Primary**	ND	ND	ND	0.03	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW115_170726	**26/07/2017**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW115_171205	**5/12/2017**	**Primary**	ND	0.1	0.11	1	0.06	2.2	ND	ND	0.21	0.05	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.2	3.82
	1302_QCSW06_171205	**5/12/2017**	**Field_D**	ND	0.11	0.11	1.1	0.06	2.2	ND	ND	0.21	0.06	0.07	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.3	3.95
	1302_SW115_180109	**9/01/2018**	**Primary**	ND	0.15	0.17	1.4	0.08	3.3	ND	ND	0.25	0.05	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.7	5.49
	1302_SW115_180308	**8/03/2018**	**Primary**	ND	0.12	0.14	1.1	0.07	2.7	ND	ND	0.16	0.04	0.05	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.8	4.4
	1302_SW115_181211	**11/12/2018**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW115_190319	**19/03/2019**	**Primary**	0.03	0.1	0.12	0.97	0.06	1.7	ND	ND	0.17	0.03	0.04	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.67	3.24
	1302_SW115_190319	**19/03/2019**	**Primary**	0.03	0.09	0.1	0.84	0.05	1.4	ND	ND	0.42	0.09	0.05	0.11	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.24	3.2
	1302_SW115_200415	**16/04/2020**	**Primary**	ND	0.06	0.06	0.53	0.03	0.89		ND	0.08	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.42**	1.67
	1302_SW115_201216	**16/12/2020**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

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				PFAS																																			
				Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluorooctanoic acid (PFOA)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	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
				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	µg/L	µg/L	µg/L	µg/L	µg/L
				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	0.01	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	0.05	0.02	0.05	0.01	0.01
Ecological Receptors	**PFAS NEMP FW 99% Species Protection**								0.00023					19																									
Human Health Receptors	**NHMRC (2019) PFAS Recreational Water**													10																								2	
	PFAS NEMP Human Health Drinking Water													**0.56**																								**0.07**	
SW120	**1302_SWLC02_20170629**	**29/06/2017**	**Primary**	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW120_170726	**26/07/2017**	**Primary**	ND	0.01	0.02	0.11	ND	0.22	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.33**	0.38
	1302_SW120_171024	**24/10/2017**	**Primary**	ND	0.01	0.02	0.12	ND	0.21	ND	ND	0.03	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.33**	0.4
	1302_SW120_171206	**6/12/2017**	**Primary**	ND	ND	0.01	0.08	ND	0.2	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.28**	0.3
	1302_SW120_180110	**10/01/2018**	**Primary**	ND	0.05	0.06	0.49	0.02	0.97	ND	ND	0.09	0.04	0.03	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.46**	1.77
	1302_SW120_180130	**30/01/2018**	**Primary**	ND	0.08	0.09	0.72	0.03	1.3	ND	ND	0.1	0.03	0.03	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.02	2.39
	1302_SW120_180306	**6/03/2018**	**Primary**	ND	0.07	0.08	0.75	0.04	1.5	ND	ND	0.15	0.04	0.04	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.25	2.69
	1302_SW120_181211	**11/12/2018**	**Primary**	ND	0.01	0.01	0.09	ND	0.13	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.22**	0.26
	1302_SW120_190319	**19/03/2019**	**Primary**	0.02	0.08	0.1	0.84	0.04	0.99	ND	ND	0.16	0.04	0.03	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.83**	2.32
	1302_SW120_190319	**19/03/2019**	**Primary**	0.02	0.08	0.08	0.8	0.04	1	ND	ND	0.67	0.12	0.05	0.1	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.8**	2.99
	1302_SW120_191114	**14/11/2019**	**Primary**	ND	0.03	0.03	0.34	ND	0.38	ND	ND	0.07	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.72**	0.86
	1302_SW120_200121	**21/01/2020**	**Primary**	ND	0.03	0.03	0.24	ND	0.34	ND	ND	0.04	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.58**	0.69
	1302_SW120_200415	**16/04/2020**	**Primary**	ND	0.06	0.07	0.65	0.04	1.11	ND	ND	0.13	ND	0.03	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.76**	2.09
	1302_SW120_201216	**16/12/2020**	**Primary**	ND	0.02	0.02	0.23	ND	0.35	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.58**	0.66
SW124	**1302_SWLC05_170425**	**25/04/2017**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SWLC05_20170629	**29/06/2017**	**Primary**	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW124_170726	**26/07/2017**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW124_171024	**24/10/2017**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW124_171208	**8/12/2017**	**Primary**	ND	ND	ND	0.01	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND
	1302_SW124_180130	**30/01/2018**	**Primary**	ND	ND	ND	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04	ND
	1302_SW124_180306	**6/03/2018**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW124_181211	**11/12/2018**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW124_190319	**19/03/2019**	**Primary**	ND	ND	ND	0.03	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.06	ND
	1302_SW124_190319	**19/03/2019**	**Primary**	ND	ND	ND	0.03	ND	0.04	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.07**	ND
	1302_SW124_191112	**12/11/2019**	**Primary**	ND	ND	ND	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.03	0.03
	1302_SW124_200122	**22/01/2020**	**Primary**	ND	ND	ND	0.03	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.09**	0.09
	1302_SW124_200415	**16/04/2020**	**Primary**	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	0.02
	1302_SW124_201216	**16/12/2020**	**Primary**	ND	ND	ND	0.03	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.09**	0.09
SW125	**1302_SW125_171206**	**6/12/2017**	**Primary**	ND	0.12	0.17	1.4	0.08	2.7	ND	ND	0.21	0.05	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.1	4.82
	1302_SW125_180110	**10/01/2018**	**Primary**	ND	0.15	0.2	1.6	0.09	3.8	ND	ND	0.26	0.07	0.07	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.4	6.28
	1302_SW125_180216	**16/02/2018**	**Primary**	ND	0.18	0.16	1.6	0.09	4.3	ND	ND	0.33	0.09	0.09	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.9	6.89
	1302_SW125_180222	**22/02/2018**	**Primary**	ND	0.02	0.02	0.2	ND	0.43	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.63**	0.7
	1302_SW125_180301	**1/03/2018**	**Primary**	ND	0.29	0.32	2.3	0.13	5.1	ND	ND	0.55	0.12	0.12	0.06	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.4	9.06
	1302_SW125_180307	**7/03/2018**	**Primary**	ND	0.38	0.45	3.6	0.23	6.6	ND	ND	0.82	0.19	0.19	0.09	ND	0.11	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10.2	12.66
	1302_SW125_180321	**21/03/2018**	**Primary**	ND	0.24	0.39	2.2	0.13	5.2	ND	ND	0.49	0.14	0.12	0.06	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.4	9.04
	1302_SW125_180329	**29/03/2018**	**Primary**	ND	0.2	0.23	2.3	0.12	3.9	ND	ND	0.47	0.12	0.12	ND	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.2	7.52
	1302_SW125_180412	**12/04/2018**	**Primary**	ND	0.2	0.28	2.9	0.19	4	ND	ND	0.45	0.1	0.11	0.06	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.9	8.36
	1302_SW125_181211	**11/12/2018**	**Primary**	ND	0.16	0.22	1.9	0.11	4.1	ND	ND	0.29	0.08	0.09	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6	7
	1302_SW125_190319	**19/03/2019**	**Primary**	0.05	0.13	0.25	1.7	0.08	3.2	0.02	ND	0.31	0.05	0.1	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.9	5.93
	1302_SW125_190319	**19/03/2019**	**Primary**	0.04	0.14	0.16	1.7	0.12	3	0.02	ND	1.6	0.27	0.12	0.24	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.7	7.47
	1302_SW125_200121	**21/01/2020**	**Primary**	ND	0.12	0.14	1.15	0.06	1.68	ND	ND	0.22	0.06	0.05	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.83	3.51
	1302_SW125_200415	**16/04/2020**	**Primary**	ND	0.14	0.16	1.49	0.1	2.76	ND	ND	0.26	0.06	0.07	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.25	5.07
	1302_SW125_201216	**16/12/2020**	**Primary**	ND	0.11	0.15	1.39	0.08	2.82	ND	0.03	0.22	0.06	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.21	4.95

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				PFAS																																			
				Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluorooctanoic acid (PFOA)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	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
				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	µg/L	µg/L	µg/L	µg/L	µg/L
				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	0.01	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	0.05	0.02	0.05	0.01	0.01
Ecological Receptors	**PFAS NEMP FW 99% Species Protection**								0.00023					19																									
Human Health Receptors	**NHMRC (2019) PFAS Recreational Water**													10																								2	
	PFAS NEMP Human Health Drinking Water													**0.56**																								**0.07**	
SW132	**1302_SWRCC02_170426**	**26/04/2017**	**Primary**	ND	0.01	0.01	0.14	ND	0.25	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SWRCC02_20170629	**29/06/2017**	**Primary**	ND	ND	ND	0.03	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW132_170726	**26/07/2017**	**Primary**	ND	ND	ND	0.03	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.08**	ND
	1302_SW132_171024	**24/10/2017**	**Primary**	ND	ND	ND	ND	ND	0.03	ND	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.03	ND
	1302_SW132_171116	**16/11/2017**	**Primary**	ND	ND	ND	0.02	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04	ND
	1302_SW132_171208	**8/12/2017**	**Primary**	ND	ND	ND	0.02	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.08**	ND
	1302_SW132_180110	**10/01/2018**	**Primary**	ND	ND	ND	0.03	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.09**	ND
	1302_SW132_180307	**7/03/2018**	**Primary**	ND	ND	ND	0.08	ND	0.2	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.28**	0.29
	1302_SW132_181211	**11/12/2018**	**Primary**	ND	ND	ND	0.04	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.1**	0.1
	1302_SW132_190319	**19/03/2019**	**Primary**	ND	ND	ND	0.05	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.13**	0.13
	1302_QCSW01_190319	**19/03/2019**	**Field_D**	ND	ND	ND	0.04	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.11**	0.11
	1302_SW132_190319	**19/03/2019**	**Primary**	ND	ND	ND	0.05	ND	0.07	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.12**	0.14
	1302_SW132_200416	**16/04/2020**	**Primary**	ND	ND	ND	0.08	ND	0.13	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.21**	0.21
	1302_SW132_201217	**17/12/2020**	**Primary**	ND	ND	ND	0.04	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.11**	0.11
SW133	**1302_SWRCC01_170426**	**26/04/2017**	**Primary**	ND	ND	ND	0.07	ND	0.08	ND	ND	0.05	0.08	0.02	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SWRCC01_20170629	**29/06/2017**	**Primary**	ND	0.01	0.02	0.12	ND	0.22	ND	ND	0.03	0.03	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW133_170726	**26/07/2017**	**Primary**	ND	0.01	0.02	0.13	ND	0.13	ND	ND	0.04	0.03	0.01	ND	ND	0.01	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.26**	0.4
	1302_SW133_171024	**24/10/2017**	**Primary**	ND	ND	0.01	0.05	ND	0.07	ND	ND	0.03	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.12**	0.21
	1302_SW133_171208	**8/12/2017**	**Primary**	ND	0.01	0.03	0.11	ND	0.13	ND	ND	0.05	0.08	0.01	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.24**	0.45
	1302_SW133_180111	**11/01/2018**	**Primary**	ND	ND	0.01	0.1	ND	0.11	ND	ND	0.07	0.13	0.01	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.21**	0.47
	1302_SW133_180307	**7/03/2018**	**Primary**	ND	ND	ND	0.06	ND	0.09	ND	ND	0.04	0.07	0.01	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.15**	0.3
	1302_SW133_181211	**11/12/2018**	**Primary**	ND	0.01	0.02	0.13	ND	0.13	ND	ND	0.04	0.06	0.01	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.26**	0.42
	1302_SW133_190319	**19/03/2019**	**Primary**	0.06	0.15	0.27	1.9	0.1	3.5	ND	ND	0.33	0.06	0.1	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.4	6.51
	1302_SW133_190319	**19/03/2019**	**Primary**	0.04	0.13	0.16	1.6	0.1	3	0.01	ND	1.5	0.26	0.11	0.22	ND	0.06	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.6	7.19
	1302_SW133_200123	**23/01/2020**	**Primary**	ND	ND	ND	0.05	ND	0.04	ND	ND	0.02	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.09**	0.15
	1302_SW133_200416	**16/04/2020**	**Primary**	ND	ND	ND	0.07	ND	0.06	ND	ND	0.03	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.13**	0.2
	1302_SW133_201217	**17/12/2020**	**Primary**	ND	ND	ND	0.05	ND	0.05	ND	ND	0.04	0.05	0.01	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.1**	0.22
SW143	**1302_SW143_170726**	**26/07/2017**	**Primary**	ND	ND	ND	0.02	ND	0.05	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.07**	ND
	1302_SW143_170907	**8/09/2017**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW143_171024	**24/10/2017**	**Primary**	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	ND
	1302_SW143_171117	**17/11/2017**	**Primary**	ND	ND	ND	0.02	ND	0.02	ND	ND	0.01	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04	ND
	1302_QC5SW_171117	**17/11/2017**	**Field_D**	ND	ND	ND	0.02	ND	0.02	ND	ND	0.01	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04	ND
	1302_SW143_171208	**8/12/2017**	**Primary**	ND	ND	ND	0.03	ND	0.11	ND	ND	0.02	0.04	0.01	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.14**	0.22
	1302_SW143_180111	**11/01/2018**	**Primary**	ND	ND	ND	0.05	ND	0.11	ND	ND	0.03	0.05	0.01	ND	ND	0.02	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.16**	0.28
	1302_SW143_180216	**16/02/2018**	**Primary**	ND	ND	ND	0.05	ND	0.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.15**	0.15
	1302_SW143_180222	**22/02/2018**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW143_180301	**1/03/2018**	**Primary**	ND	ND	ND	0.03	ND	0.08	ND	ND	0.01	0.02	ND	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.11**	0.15
	1302_SW143_180307	**7/03/2018**	**Primary**	ND	ND	ND	0.04	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.11**	0.11
	1302_SW143_180321	**21/03/2018**	**Primary**	ND	ND	ND	0.04	ND	0.07	ND	ND	0.01	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.11**	0.14
	1302_SW143_180329	**29/03/2018**	**Primary**	ND	0.22	0.25	2.6	0.13	4.1	ND	ND	0.52	0.14	0.13	0.06	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	6.7	8.22
	1302_SW143_181211	**11/12/2018**	**Primary**	ND	ND	ND	0.02	ND	0.04	ND	ND	0.01	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.06	ND
	1302_SW143_190319	**19/03/2019**	**Primary**	ND	ND	ND	0.04	ND	0.11	ND	ND	0.02	0.02	ND	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.15**	0.2
	1302_SW143_190319	**19/03/2019**	**Primary**	ND	ND	ND	0.04	ND	0.13	ND	ND	0.08	0.18	0.03	0.08	ND	0.05	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.17**	0.61
	1302_SW143_200416	**16/04/2020**	**Primary**	ND	ND	ND	0.05	ND	0.07	ND	ND	0.04	0.04	0.02	ND	ND	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.12**	0.25
	1302_SW143_201217	**17/12/2020**	**Primary**	ND	ND	ND	0.14	ND	0.23	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.37**	0.4
SW156	**1302_SW156_180129**	**29/01/2018**	**Primary**	ND	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	ND
	1302_SW156_180314	**14/03/2018**	**Primary**	ND	0.03	0.04	0.34	0.01	0.38	ND	ND	0.05	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.72**	0.86
	1302_SW156_181213	**13/12/2018**	**Primary**	ND	ND	ND	ND	ND	0.08	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.08**	ND
	1302_SW156_200123	**21/01/2020**	**Primary**	ND	ND	ND	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04	0.04
		16/04/2020		**Dry**																																			
		20/01/2021		**Dry**																																			

Table T8
PFAS Historical Surface Water Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

				PFAS																																			
				Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluorooctanoic acid (PFOA)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	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
				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	µg/L	µg/L	µg/L	µg/L	µg/L
				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	0.01	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	0.05	0.02	0.05	0.01	0.01
Ecological Receptors	**PFAS NEMP FW 99% Species Protection**								0.00023					19																									
Human Health Receptors	**NHMRC (2019) PFAS Recreational Water**													10																								2	
	PFAS NEMP Human Health Drinking Water													**0.56**																								**0.07**	
SW160	**1302_SW160_180129**	**29/01/2018**	**Primary**	ND	ND	ND	0.05	ND	0.07	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.12**	0.12
	1302_SW160_180305	**5/03/2018**	**Primary**	ND	0.09	0.1	0.73	0.06	2.6	ND	ND	0.21	0.05	0.05	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.33	3.92
	1302_SW160_190325	**25/03/2019**	**Primary**	ND	ND	ND	0.06	ND	0.26	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.32**	0.33
	1302_SW160_200122	**22/01/2020**	**Primary**	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	0.02
		16/04/2020		**Dry**																																		
		20/01/2021		**Dry**																																		
SW162	**1302_QCSW8_171025**	**24/10/2017**	**Field_D**	ND	ND	ND	ND	ND	0.04	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04	ND
	1302_SW162_171025	**25/10/2017**	**Primary**	ND	ND	ND	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.03	ND
	1302_SW162_180108	**8/01/2018**	**Primary**	ND	ND	ND	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND
	1302_QCSW05_180108	**8/01/2018**	**Field_D**	ND	ND	ND	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	ND
	1302_SW162_180215	**15/02/2018**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW162_180222	**22/02/2018**	**Primary**	ND	0.02	0.02	0.2	ND	0.47	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.67**	0.74
	1302_SW162_180301	**1/03/2018**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW162_180305	**5/03/2018**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW162_190322	**22/03/2019**	**Primary**	ND	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	ND
	1302_QCSW08_190322	**22/03/2019**	**Field_D**	ND	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	ND
	QCSW09_190322	**22/03/2019**	**Interlab_D**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW162_200121	**21/01/2020**	**Primary**	ND	ND	ND	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.03	0.03
	1302_SW162_200414	**16/04/2020**	**Primary**	ND	ND	ND	0.03	ND	0.08		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.11**	0.11
	1302_SW162_201218	**18/12/2020**	**Primary**	ND	ND	ND	ND	ND	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.05
	1302_SW162_210121	**21/01/2021**	**Primary**	ND	ND	ND	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04	0.04
SW168	**1302_SW002_20170629**	**29/06/2017**	**Primary**	ND	0.1	0.09	1	0.04	1.6	ND	ND	0.14	0.03	0.05	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW168_170726	**26/07/2017**	**Primary**	ND	0.1	0.12	0.86	0.05	1.5	ND	ND	0.18	0.06	0.05	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.36	2.95
	1302_SW168_171024	**24/10/2017**	**Primary**	ND	0.07	0.07	0.66	0.03	1.5	ND	ND	0.22	0.09	0.08	0.06	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.16	2.82
	1302_SW168_171207	**7/12/2017**	**Primary**	ND	0.09	0.13	0.83	0.05	1.7	ND	ND	0.12	0.03	0.04	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.53	3.01
	1302_SW168_180109	**9/01/2018**	**Primary**	ND	0.06	0.07	0.6	0.03	1.3	ND	ND	0.13	0.03	0.05	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.9**	2.29
	1302_SW168_180215	**15/02/2018**	**Primary**	ND	0.09	0.08	0.62	0.03	1.5	ND	ND	0.16	0.05	0.07	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.12	2.63
	1302_SW168_180222	**22/02/2018**	**Primary**	ND	0.01	0.02	0.24	0.01	1	ND	ND	0.04	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.24**	1.34
	1302_SW168_180301	**1/03/2018**	**Primary**	ND	0.08	0.09	0.55	0.03	1.3	ND	ND	0.15	0.04	0.06	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.85**	2.33
	1302_SW168_180308	**8/03/2018**	**Primary**	ND	0.07	0.07	0.43	0.03	0.93	ND	ND	0.12	0.03	0.05	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.36**	1.76
	1302_SW168_180321	**21/03/2018**	**Primary**	ND	0.05	0.08	0.35	0.02	0.82	ND	ND	0.1	0.03	0.04	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.17**	1.51
	1302_SW168_180329	**29/03/2018**	**Primary**	ND	0.05	0.05	0.41	0.02	0.7	ND	ND	0.09	0.02	0.04	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.11**	1.4
	1302_SW168_181211	**11/12/2018**	**Primary**	ND	0.1	0.12	1	0.05	2.1	ND	ND	0.15	0.03	0.05	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3.1	3.62
	1302_SW168_190319	**19/03/2019**	**Primary**	0.01	0.05	0.05	0.45	0.02	0.7	ND	ND	0.08	0.02	0.03	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.15**	1.43
	1302_SW168_190319	**19/03/2019**	**Primary**	0.01	0.05	0.05	0.39	0.02	0.66	ND	ND	0.17	0.06	0.05	0.06	ND	0.03	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.05**	1.56
	1302_SW168_200121	**21/01/2020**	**Primary**	ND	0.05	0.06	0.45	0.03	0.69	ND	ND	0.09	0.02	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.14**	1.41
	1302_SW168_200415	**16/04/2020**	**Primary**	ND	0.08	0.08	0.57	0.03	0.71	ND	ND	0.12	0.02	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.28**	1.65
	1302_SW168_201216	**16/12/2020**	**Primary**	ND	ND	ND	0.07	ND	0.27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.34**	0.34

Table T8
PFAS Historical Surface Water Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

				PFAS																																			
				Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononanesulfonic acid (PFNS)	Perfluorodecane sulfonic acid (PFDS)	Perfluorohexanoic acid (PFHxA)	Perfluoropentanoic acid (PFPeA)	Perfluorooctanoic acid (PFOA)	Perfluorobutanoic acid (PFBA)	Perfluorodecanoic acid (PFDA)	Perfluoroheptanoic acid (PFHpA)	Perfluorododecanoic acid (PFDoDA)	Perfluorononanoic acid (PFNA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	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
				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	µg/L	µg/L	µg/L	µg/L	µg/L
				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	0.01	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	0.05	0.02	0.05	0.01	0.01
Ecological Receptors	**PFAS NEMP FW 99% Species Protection**								0.00023					19																									
Human Health Receptors	**NHMRC (2019) PFAS Recreational Water**													10																								2	
	PFAS NEMP Human Health Drinking Water													**0.56**																								**0.07**	
SW170	**1302_SW170_171025**	**25/10/2017**	**Primary**	ND	ND	ND	0.04	ND	0.48	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.07	0.01	ND	ND	ND	ND	ND	ND	ND	ND	**0.52**	0.6
	1302_QCSW02_171204	**4/12/2017**	**Field_D**	ND	ND	ND	0.02	ND	0.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.18**	0.18
	1302_SW170_171204	**4/12/2017**	**Primary**	ND	ND	ND	0.02	ND	0.16	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.18**	0.18
	1302_SW170_180108	**8/01/2018**	**Primary**	ND	ND	ND	0.02	ND	0.23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.25**	0.25
	1302_SW170_180215	**15/02/2018**	**Primary**	ND	0.11	0.1	1.1	0.07	3.6	ND	ND	0.21	0.05	0.05	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4.7	5.31
	1302_SW170_180222	**22/02/2018**	**Primary**	ND	0.02	0.02	0.22	0.01	1.3	ND	ND	0.04	0.01	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.52**	1.63
	1302_SW170_180301	**1/03/2018**	**Primary**	ND	0.01	0.01	0.09	ND	0.4	ND	ND	0.02	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.49**	0.54
	1302_SW170_180305	**5/03/2018**	**Primary**	ND	0.03	0.03	0.38	0.02	1.6	ND	ND	0.07	0.02	0.03	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.98	2.19
	1302_SW170_180321	**21/03/2018**	**Primary**	ND	0.02	0.04	0.28	0.02	1.3	ND	ND	0.05	0.02	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.58**	1.75
	1302_SW170_180329	**29/03/2018**	**Primary**	ND	ND	0.01	0.17	0.01	0.9	ND	ND	0.03	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**1.07**	1.13
	1302_SW170_190319	**19/03/2019**	**Primary**	ND	ND	ND	0.06	ND	0.3	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.36**	0.37
	1302_SW170_190319	**19/03/2019**	**Primary**	ND	ND	ND	0.06	ND	0.27	ND	ND	0.06	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.33**	0.41
	1302_SW170_200121	**21/01/2020**	**Primary**	ND	ND	ND	ND	ND	0.12	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.12**	0.12
	1302_SW170_200414	**16/04/2020**	**Primary**	ND	ND	ND	0.07	ND	0.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.26**	0.26
	1302_SW170_210120	**20/01/2021**	**Primary**	ND	ND	ND	0.09	ND	0.24	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.33**	0.33
SW178	**1302_SW178_180305**	**5/03/2018**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW178_190322	**22/03/2019**	**Primary**	ND	ND	ND	ND	ND	0.04	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.04	ND
	1302_SW178_210120	**21/01/2020**	**Primary**	ND	ND	ND	ND	ND	0.02	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.02	0.02
		16/04/2020		**Dry**																																			
	1302_SW178_210120	**20/01/2021**	**Primary**	ND	ND	ND	ND	ND	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.01	0.01
SW181	**1302_SW181_180129**	**29/01/2018**	**Primary**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	1302_SW181_180312	**12/03/2018**	**Primary**	ND	ND	ND	0.07	ND	0.57	ND	ND	0.03	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.64**	0.67
	1302_SW181_190322	**22/03/2019**	**Primary**	ND	0.02	ND	0.06	ND	0.25	ND	ND	0.03	0.01	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.31**	0.37
	1302_SW181_200121	**21/01/2020**	**Primary**	ND	ND	ND	ND	ND	0.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.15**	0.15
		16/04/2020		**Dry**																																			
	1302_SW181_201218	**18/12/2020**	**Primary**	ND	ND	ND	0.03	ND	0.35	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.38**	0.47
	1302_SW181_210120	**20/01/2021**	**Primary**	ND	ND	ND	ND	ND	0.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.19**	0.19

Table T9
Non-PFAS Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

					DOC	Inorganics														Metals		
					Dissolved Organic Carbon	Alkalinity (Bicarbonate as CaCO3)	Alkalinity (Carbonate as CaCO3)	Alkalinity (Hydroxide) as CaCO3	Alkalinity (total) as CaCO3	Anions Total	Cations Total	Chloride	Fluoride	Ionic Balance	pH (Lab)	Sodium (Filtered)	Sulfate as SO4 - Turbidimetric (Filtered)	TDS	TSS	Calcium (Filtered)	Magnesium (Filtered)	Potassium (Filtered)
					mg/L	mg/L	mg/L	µg/L	mg/L	meq/L	meq/L	mg/L	mg/L	%	pH Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
				PQL	1	1	1	1000	1	0.01	0.01	1	0.1	0.01	0.01	1	1	10	5	1	1	1
Location Code	**Field ID**	**Sampled Date**	**Lab Report Number**	**Sample Type**																		
SW114	1302_SW114_201216	16/12/2020	ES2045380	Primary	2	28	<1	<1000	28	0.67	0.57	4	0.1	-	7.23	5	<1	37	18	5	1	1
SW115	1302_SW115_201216	16/12/2020	ES2045380	Primary	<1	2	<1	<1000	2	0.04	0.09	<1	<0.1	-	6.57	1	<1	<10	9	1	<1	<1
SW124	1302_SW124_201216	16/12/2020	ES2045380	Primary	2	130	<1	<1000	130	428	408	13,600	0.5	2.44	7.57	7220	2030	28,200	44	318	865	274
SW168	1302_SW168_201216	16/12/2020	ES2045380	Primary	4	8	<1	<1000	8	0.22	0.09	2	<0.1	-	5.99	1	<1	33	23	1	<1	<1
SW133	1302_SW133_201217	17/12/2020	ES2045380	Primary	2	16	<1	<1000	16	2.72	2.46	71	0.1	-	7.15	15	19	173	15	28	<1	16
SW143	1302_SW143_201217	17/12/2020	ES2045380	Primary	<1	93	<1	<1000	93	159	148	5100	0.4	3.78	8.08	2610	645	10,000	30	121	310	97

Notes:
PQL: Practical Quantification Limit
mg/L: microgram per Litre
µg/L: microgram per Litre
meq/L: milliequivalant per Litre
%: percentage

19/02/2021
Checked By: Kim Treglown
Checked 19/02/2021:

Appendix C

Data Validation Report

Appendix C Analytical Data Validation

AECOM Imagine it. Delivered.

DATA VALIDATION REPORT; BIOTA AND SURFACE WATER

Project Manager: [redacted] **Validation by:** [redacted]

Project number: 60612561 **Date:** 05/02/2021

Site: RAAF Darwin

Matrix: Biota and surface water **Data Verified by:**

Laboratory: ALS (Sydney) **Date:** 11/02/2021

Lab reference: ES2040589

Key Findings:
The biota analytical data can be used as a basis for interpretation, subject to the limitations outlined below:

- The elevated RPD should be taken into account when using sum of PFAS results quantitatively for sample BIOAFA199.
- Potential exists for concentrations of PFPeA and MeFOSE to be under-reported by 31.2% and 20.5%, respectively. This should be taken into consideration when using results quantitatively.
- Potential over-reporting of MeFOSA will not affect the interpretation of the results, as all samples reported MeFOSA concentrations below the PQL.
- Potential exists for concentrations of MeFOSE to be under-reported by 32.3%. This should be taken into consideration when using MeFOSE results quantitatively.

Component		Outliers			Material impact on interpretation
		No	Yes	Comment	
Frequency of field quality assurance/quality control (QAQC)		✓			No
Number of tests requested/reported		✓			No
Sample handling/preservation/holding times			✓	1	No
Frequency of laboratory QA/QC			✓	2	No
Limits of reporting (LOR)			✓	3	No
Blank analysis	Field blank	✓			No
	Rinsate blank	✓			No
	Trip blank	✓			No
	Method blank	✓			No
Field intra-laboratory relative percent differences (RPDs)		✓			No
Field inter-laboratory RPDs		✓			No
Laboratory duplicate RPDs			✓	4	No
Matrix spike (MS) % recoveries			✓	5	No
Laboratory control spike (LCS) % recoveries			✓	6	No
Surrogate % recoveries		✓			No
Other observations		✓			N/A

1 of 3

Comments	
1. Sample handling	**Sample Handling** Primary, split and composite biota and surface water samples were received preserved and chilled at the laboratory. The sample receipt temperature for lab batch ES2040589 is below: Biota samples were received frozen, as recommended, in snap lock bags. ALS laboratory commented on the sample receipt notification that frozen samples are preferred to be received unbagged.
2. Frequency of laboratory QA/QC	Matrix spike (MS) and laboratory duplicate quality control samples were not reported for PFAS analytes in surface water. The accuracy of the MS data can be assessed as acceptable based on available water method blanks, laboratory control spikes and surrogate recoveries which were reported at or above the required frequencies and within control limits for these analytes. Precision can be assessed against surface water field duplicate and triplicate RPDs, which were reported at the required frequency and within control limits (except one pair of samples for PFOS).
3. Limits of Reporting (LOR)	Limits of reporting were sufficiently low to enable assessment against adopted guideline criteria, except for PFOS. The potential exists for concentrations of key COPC PFOS to be above the PFAS NEMP fresh water 99% species protection guideline, but below the laboratory LOR. This should be taken into consideration when interpreting data and using data quantitatively.
4. Laboratory duplicate RPDs	The relative percentage difference for sum of PFAS between biota sample BIOAFA199 and laboratory sample ES2040589-046 was elevated (66.7%). As there is no adopted guideline for sum of PFAS, this apparent lack of precision will not affect the interpretation of results against the guidelines. However, the elevated RPD should be taken into account when using sum of PFAS results quantitatively
5. Matrix spike (MS) % recoveries	Matrix spike (MS) recoveries (where reported) were within control limits, with exception of the following samples: • The matrix spike recovery was not determined for PFPeA due to recovery levels less than the lower data quality objective in ES2040589-024 (BIOAFA177). • The matrix spike recovery was not determined for MeFOSA due to recovery levels greater than the upper data quality objective in ES2040589-024 (BIOAFA177) and ES2040589-002 (BIOAFA155). • The matrix spike recovery was not determined for MeFOSE due to recovery levels less than the lower data quality objective in ES2040589-002 (BIOAFA155). Potential exists for concentrations of PFPeA and MeFOSE to be under-reported by 31.2% and 20.5%, respectively. This should be taken into consideration when using results quantitatively. Potential over-reporting of MeFOSA will not affect the interpretation of the results, as all samples reported MeFOSA concentrations below the PQL. ALS laboratory commented that poor matrix spike recovery was due to matrix interferences (confirmed by re-analysis).

Batch Number	Temperature (°C)
ES2040589	1.6°C (frozen)

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6. Laboratory control spike (LCS) % recoveries	Laboratory control spike (LCS) recoveries (where reported) were within control limits, with exception of the following:The laboratory control spike recovery for MeFOSE in laboratory sample QC-3377787-002 was less than the lower control limit. Potentials exists for concentrations of MeFOSE to be under-reported by 32.3%. This should be taken into consideration when using MeFOSE results quantitatively.

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DATA VALIDATION REPORT; GROUNDWATER

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:** 04/02/2021	[redacted]
Site:	RAAF Darwin		
Matrix:	Groundwater	**Data Verified by:**	
Laboratory:	ALS (Sydney), NMI (Sydney)	**Date:** 11/02/2021	
Lab reference:	ES2039162, RN1294219		

Key Findings:
The groundwater analytical data can be used as a basis for interpretation, subject to the limitations outlined below

- The elevated RPDs for sum of PFHxs+PFOS and sum of PFAS should be taken into consideration when using the data quantitatively.
- The potential exists for the reported analyte concentrations to be biased high for PFHxS, PFPeS, PFPeA, PFBS, PFHpS, PFHxA. The elevated RPDs for these analytes should be taken into consideration when using the data quantitatively.
- Elevated RPDs for PFOA should be taken into consideration when concentrations are close to guidelines.

Component		Outliers			Material impact on interpretation
		No	Yes	Comment	
Frequency of field quality assurance/quality control (QAQC)		✓			No
Number of tests requested/reported		✓			No
Sample handling/preservation/holding times			✓	1,2,	No
Frequency of laboratory QA/QC			✓	3	No
Limits of reporting (LOR)			✓	4	No
Blank analysis	Field blank	✓			No
	Rinsate blank	✓			No
	Trip blank	✓			No
	Method blank	✓			No
Field intra-laboratory relative percent differences (RPDs)			✓	5	No
Field inter-laboratory RPDs			✓	6	No
Laboratory duplicate RPDs		✓			No
Matrix spike (MS) % recoveries		✓			No
Laboratory control spike (LCS) % recoveries		✓			No
Surrogate % recoveries		✓			No
Other observations			✓	7	N/A

Comments

1 of 3

1. Sample handling	**Sample handling** Primary, duplicate and triplicate groundwater samples were received preserved and chilled at the laboratory. The sample receipt temperatures for lab batches are as below: The sample receipt temperature for primary batch ES2039162 is outside the recommended temperature range (<6°C). As the samples were recorded marginally outside the recommended temperature range there may be a small chance of under reporting. However, as the temperature is recorded well below the recorded groundwater temperature at the time of sampling (>30°C) and samples were immediately cooled upon collection, the likelihood of under reporting is unlikely and not considered to materially affect the interpretation of results.
2. Sample holding times	**Sample Holding Times** Samples were analysed marginally outside of recommended holding times for dissolved major cations in samples MW194, MW103 and MW185. There is the potential for dissolved major cations to have degraded over time and not be truly representative of field conditions. As this analyte is not considered a contaminant of potential concern (COPC) for these samples, the potential for under reporting is not considered to materially affect the interpretation of results, however, should be taken into consideration when using the data for interpretive purposes.
3. Frequency of laboratory QA/QC	**Frequency of Laboratory QA/QC** Matrix spike quality control samples were not reported for PFAS. The accuracy of the data can be assessed as acceptable based on available method blanks, laboratory control spikes and surrogate recoveries which were reported at or above the required frequencies and within control limits for these analytes Precision can be assessed against groundwater field duplicate and triplicate RPDs, which were reported at the required frequency and generally within control limits (for exceptions see section 5.0 and 6.0 of this data validation report).
4. Limits of Reporting	**Limits of Reporting** Limits of reporting were sufficiently low to enable assessment against adopted guideline criteria, except for PFOS. The potential exists for concentrations of key COPC PFOS to be above the PFAS NEMP fresh water 99% species protection guideline, but below the laboratory LOR. This should be taken into consideration when interpreting data and using data quantitatively.

Batch Number	Temperature (°C)
ES2039162	6.6°C
RN1294219	Chilled

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5. Field intra-laboratory relative percent differences (RPDs)	Field intra-laboratory RPDs were reported generally within control limits, except for the following samples (the sample with the higher reported concentration is in bold): • **MW195** and QC100 for PFOS (53%) • **MW195** and QC100 for Sum of PFAS (50%) • **MW195** and QC100 for Sum of PFHxS + PFOS (50%) The potential exists for the reported PFOS concentrations to be biased low. This apparent lack of precision should be considered when interpreting concentrations of PFOS reported just below the adopted guideline value. As all concentrations of PFOS were reported either well above the guideline value or are below the LOR, the elevated RPDs are not expected to affect the interpretation of results. The potential exists for Sum of PFHxS+PFOS and Sum of PFAS concentrations to be biased high. As there are no guideline values for theses analytes this apparent lack of precision will not affect the overall interpretation or results. However, the elevated RPDs should be taken into consideration when using the data quantitatively.
6. Field inter-laboratory RPDs	Field inter-laboratory RPDs were reported within control limits, except for the following (the sample with higher reported concentration is in bold): • **MW195** and QC200 for PFOS (34%) • **MW107** and QC201 for PFPeS (45%) • **MW107** and QC201 for PFOS (47%) • **MW112** and QC202 for PFBS (33%) • **MW112** and QC202 for PFHpS (77%) • **MW112** and QC202 for PFHxA (33%) • **MW112** and QC202 for PFPeS (60%) • **MW112** and QC202 for PFOS (67%) • **MW112** and QC202 for PFOA (58%) • **MW112** and QC202 for PFHxS (52%) • **MW303** and QC203 for PFBS (56%) • **MW303** and QC203 for PFHpS (64%) • **MW303** and QC203 for PFHpA (58%) • **MW303** and QC203 for PFHxA (67%) • **MW303** and QC203 for PFPeS (77%) • **MW303** and QC203 for PFPeA (35%) • **MW303** and QC203 for PFOS (93%) • **MW303** and QC203 for PFOA (54%) • **MW303** and QC203 for PFHxS (59%) The potential exists for the reported analyte concentrations to be biased high. However, as there are no guideline values for PFHxS, PFPeS, PFPeA, PFBS, PFHpS, PFHxA this apparent lack of precision will not affect the overall interpretation of results. However, the elevated RPDs should be taken into consideration when using the data quantitatively. As all concentrations of PFOS were reported either well above the guideline value or are below the LOR, the elevated RPDs are not expected to affect the interpretation of results. Elevated RPDs for PFOA should be taken into consideration when concentrations are close to guidelines.
7. Other observations	ALS laboratory commented: -EP231X: Surrogate recovery bias low due to sample matrix interferences. -Amendment (18/11/2020): This report has been amended as a result of a request to change of project ID. All analysis results are as per the previous report.

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DATA VALIDATION REPORT; SURFACE WATER

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:** 05/02/2021	[redacted]
Site:	RAAF Darwin		
Matrix:	Surface Water	**Data Verified by:**	
Laboratory:	ALS (Sydney), NMI Sydney	**Date:** 11/02/2021	
Lab reference:	ES2045380, ES2102255, ES2101132, RN1299485, RN1302294		

Key Findings:
The surface water analytical data can be used as a basis for interpretation, subject to the limitations outlined below:

- Elevated RPDs should be taken into consideration when using data for PFOS quantitatively.
- The potential exists for concentrations of PFOS to be below the LOR, but above the guideline in all samples.
- Holding time exceedances should be taken into consideration when interpreting results for dissolved major cation quantitatively.

Component		Outliers			Material impact on interpretation
		No	Yes	Comment	
Frequency of field quality assurance/quality control (QAQC)		✓			No
Number of tests requested/reported		✓			No
Sample handling/preservation/holding times			✓	1, 2	No
Frequency of laboratory QA/QC		✓		3	No
Limits of reporting (LOR)			✓	4	No
Blank analysis	Field blank	✓			No
	Rinsate blank	✓			No
	Trip blank	✓			No
	Method blank	✓			No
Field intra-laboratory relative percent differences (RPDs)		✓			No
Field inter-laboratory RPDs			✓	5	No
Laboratory duplicate RPDs		✓			No
Matrix spike (MS) % recoveries		✓			No
Laboratory control spike (LCS) % recoveries		✓			No
Surrogate % recoveries		✓			No
Other observations			✓	6	N/A

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Comments	
1.Sample handling	**Sample handling** Primary, duplicate and triplicate groundwater samples were received preserved and chilled at the laboratory. The sample receipt temperatures for lab batches are as below: The sample receipt temperatures for primary batch ES2045380 and ES2102255 are outside the recommended temperature range (<6°C). However, as the temperatures are recorded well below the ambient surface water temperature at the time of sampling (>30°C) and samples were immediately cooled upon collection, the likelihood of under reporting due temperature exceedances is unlikely and not considered to materially affect the interpretation of results.
2.Sample holding times	**Sample Holding Times** All samples were received within recommended holding times, with the exception of dissolved major cations and pH analysis in ES2045380. Samples from ES2045380 were analysed marginally outside of recommended holding times for Dissolved Major Cations in samples SW115, SW168, SW133 and SW143. Similarly, samples were analysed marginally outside of recommended holding time for pH in samples SW124, SW115, SW114, SW168, SW133 and SW143. There is the potential for dissolved major cations to have degraded over time and not be truly representative of field conditions, which is also the case for pH. As these analytes are not considered contaminants of potential concern (COPC) for these samples, and pH is tested in the field prior to dispatching the sample, the potential for under reporting is not considered to materially affect the interpretation of results.
3. Frequency of laboratory QA/QC	**Frequency of laboratory QA/QC** Matrix spike and Laboratory Duplicate quality control samples were reported below the required rate for PFAS. The accuracy of the data can be assessed as acceptable based on available method blanks, laboratory control spikes and surrogate recoveries which were reported at or above the required frequencies and within control limits for these analytes. Precision can be assessed against surface water field duplicate and triplicate RPDs, which were reported at the required frequency and generally within control limits (for exceptions see section 5.0 of this data validation report).
4.Limits of Reporting	**Limits of Reporting** Limits of reporting were sufficiently low to enable assessment against adopted guideline criteria, except for PFOS. The potential exists for concentrations of key COPC PFOS to be above the PFAS NEMP fresh water 99% species protection guideline, but below the laboratory LOR. This should be taken into consideration when interpreting data and using data quantitatively.

Batch Number	Temperature (°C)
ES2045380	17.6 °C
ES2101132	4.7 °C
ES2102255	10.2 °C
RN1299485	Chilled
RN1302294	Chilled

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5.	Field Inter-laboratory relative percentage differences (RPDs)	Field inter-laboratory RPDs were reported within control limits, except for the following (the sample with higher reported concentration is in bold): • **SW170** and QC200 for PFOS (40%) The potential exists for the reported analyte concentrations to be biased high. However, as concentrations of PFOS are either below the LOR or well above the PFAS NEMP fresh water 99% species protection guideline, this will not affect the interpretation of PFOS results against guidelines. However, the elevated RPDs should be taken into consideration when using the data quantitatively.
6.	Other observations	**ES2045380:** TDS by method EA-015 may bias high for SW168 due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper. **ES2102255_1:**Amendment (08/02/2021): This report has been amended as a result of a request to change sample dates. All analysis results are as per the previous report.

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Biota Blanks Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled Date		5/11/2020	6/11/2020
	Matrix type		Water	Water
	Lab Report Number		ES2040589	ES2040589
	Sample Type		Rinsate	Trip Blank
	Field ID		1302_QC302_201105	1302_QC502_201106
ChemName	**Units**	**PQL**		
PFAS Full Suite				
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et	µg/L	0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFO	µg/L	0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (M	µg/L	0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeF	µg/L	0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02	<0.02	<0.02

19/02/2021
Checked By:Azrai Parish-Perandis
Checked 19/02/2021:

Biota RPD Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled Date		3/11/2020	3/11/2020	RPD	3/11/2020	3/11/2020	RPD	4/11/2020	4/11/2020	RPD
	Matrix Type		Biota	Biota		Biota	Biota		Biota	Biota	
	Lab Report Number		ES2040589	ES2040589		ES2040589	ES2040589		ES2040589	ES2040589	
	Sample Type		Primary	Composite		Primary	Composite		Primary	Composite	
	Field ID		1302_BIOAFA154_201103	1302_QC122_201103		1302_BIOAFA155_201103	1302_QC123_201103		1302_BIOAFA178_201104	1302_QC126_201104	
ChemName	**Units**	**PQL**									
PFAS Full Suite											
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorobutanoic acid (PFBA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorononanoic acid (PFNA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
PFOS - Linear	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	0.001	0.001	0
Sum of PFAS	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	0.001	0.001	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	0.001	0.001	0
Perfluorooctanoic Acid (PFOA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0

**High RPDs are in bold (Acceptable RPDs for each PQL multiplier range are: 200 (1-10 x PQL); 50 (10-20 x PQL); 30 (> 20 x PQL))
***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

19/02/2021
Checked By: Azrai Parish-Perandis
Checked 19/02/2021:

Biota RPD Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled Date		4/11/2020	4/11/2020		4/11/2020	4/11/2020	
	Matrix Type		Biota	Biota		Biota	Biota	
	Lab Report Number		ES2040589	ES2040589	RPD	ES2040589	ES2040589	RPD
	Sample Type		Primary	Composite		Primary	Composite	
	Field ID		1302_BIOAFA180_201104	1302_QC128_201104		1302_BIOAFA181_201104	1302_QC129_201104	
ChemName	**Units**	**PQL**						
PFAS Full Suite								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorobutanoic acid (PFBA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorononanoic acid (PFNA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
PFOS - Linear	mg/kg	0.001	0.002	0.001	67	0.005	0.002	86
Sum of PFAS	mg/kg	0.001	0.002	0.002	0	0.009	0.003	100
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.001	0.002	0.002	0	0.007	0.003	80
Perfluorooctanoic Acid (PFOA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.001	<0.001	<0.001	0	0.002	<0.001	67

**High RPDs are in bold (Acceptable RPDs for each PQL multiplier range are: 200 (1-10 x F
***Interlab Duplicates are matched on a per compound basis as methods vary between labo

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Checked 19/02/2021:

Groundwater Blanks Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled_Date/Time		2/11/2020	2/11/2020	2/11/2020	3/11/2020	3/11/2020
	Matrix Type		Water	Water	Water	Water	Water
	Lab Report Number		ES2039162	ES2039162	ES2039162	ES2039162	ES2039162
	Sample Type		Rinsate	Field Blank	Trip Blank	Rinsate	Field Blank
	Field ID		1302_QC300_201102	1302_QC400_201102	1302_QC500_201102	1302_QC301_201103	1302_QC401_201103
ChemName	**Units**	**PQL**					
PFAS Full Suite							
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFO	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (I	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeF	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02

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Groundwater Blanks Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled_Date/Time		3/11/2020	4/11/2020	4/11/2020	4/11/2020
	Matrix Type		Water	Water	Water	Water
	Lab Report Number		ES2039162	ES2039162	ES2039162	ES2039162
	Sample Type		Trip Blank	Rinsate	Trip Blank	Trip Blank
	Field ID		1302_QC501_201103	1302_QC302_201104	1302_QC402_201104	1302_QC502_201104
ChemName	**Units**	**PQL**				
PFAS Full Suite						
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFO	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (I	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeF	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02

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Checked 19/02/2021:

Groundwater RPD Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled Date/Time		2/11/2020	2/11/2020	RPD	2/11/2020	2/11/2020	RPD
	Matrix		Groundwater	Groundwater		Groundwater	Groundwater	
	Lab Report Number		ES2039162	ES2039162		ES2039162	RN1294219	
	Sample Type		Primary	Intralab Duplicate		Primary	Interlab Duplicate	
	Field ID		1302_MW195_201102	1302_QC100_201102		1302_MW195_201102	1302_QC200_201102	
ChemName	**Units**	**EQL**						
PFAS Full Suite								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	<0.01	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02	<0.05	<0.05	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFO	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02	<0.05	<0.05	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
N-Methyl perfluorooctane sulfonamidoethanol (Mel	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05	<0.1	<0.1	0	<0.1	<0.05	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02	<0.05	<0.05	0	<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Sum of PFAS	µg/L	0.01	**0.3**	**0.18**	**50**	0.3	0.214	33
Sum of PFHxS and PFOS	µg/L	0.01	**0.3**	**0.18**	**50**	0.3	0.214	33
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02	**0.24**	**0.14**	**53**	**0.24**	**0.17**	**34**
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02 : 0.01	0.06	0.04	40	0.06	0.044	31

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 200 (1-10 x EQL); 50 (10-20 x EQL); 30 (> 20 x EQL))
***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

Groundwater RPD Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled Date/Time		2/11/2020	2/11/2020	RPD	2/11/2020	2/11/2020	RPD
	Matrix		Groundwater	Groundwater		Groundwater	Groundwater	
	Lab Report Number		ES2039162	ES2039162		ES2039162	RN1294219	
	Sample Type		Primary	Intralab Duplicate		Primary	Interlab Duplicate	
	Field ID		1302_MW107_201102	1302_QC101_201102		1302_MW107_201102	1302_QC201_201102	
ChemName	**Units**	**EQL**						
PFAS Full Suite								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	<0.01	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02	<0.05	<0.05	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFO	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02	<0.05	<0.05	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
N-Methyl perfluorooctane sulfonamidoethanol (Mel	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01	0.32	0.34	6	0.32	0.33	3
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05	<0.1	<0.1	0	<0.1	0.088	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01	0.3	0.29	3	0.3	0.18	50
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01	0.13	0.14	7	0.13	0.1	26
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01	0.71	0.74	4	0.71	0.64	10
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01	0.57	0.61	7	**0.57**	**0.36**	**45**
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	0.12	0.12	0	0.12	0.15	22
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02	<0.05	<0.05	0	<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Sum of PFAS	µg/L	0.01	13.3	13.4	1	13.3	9.438	33
Sum of PFHxS and PFOS	µg/L	0.01	10.9	10.9	0	10.9	7.4	38
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02	6.95	6.65	4	**6.95**	**4.3**	**47**
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.24	0.23	4	0.24	0.19	23
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02 : 0.01	3.93	4.28	9	3.93	3.1	24

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 20(
***Interlab Duplicates are matched on a per compound basis as methods vary bet

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Checked By: Azrai Parish-Perandis
Checked 19/02/2021:

Groundwater RPD Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled Date/Time		3/11/2020	3/11/2020	RPD	3/11/2020	3/11/2020	RPD	
	Matrix		Groundwater	Groundwater		Groundwater	Groundwater		
	Lab Report Number		ES2039162	ES2039162		ES2039162	RN1294219		
	Sample Type		Primary	Intralab Duplicate		Primary	Interlab Duplicate		
	Field ID		1302_MW112_201103	1302_QC102_201103		1302_MW112_201103	1302_QC202_201103		
ChemName	**Units**	**EQL**							
PFAS Full Suite									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	<0.01	0	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	<0.01	0	
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	<0.01	0	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	<0.01	0	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02	<0.05	<0.05	0	<0.05	<0.02	0	
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0	
N-Ethyl perfluorooctane sulfonamidoethanol (EtFO	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02	<0.05	<0.05	0	<0.05	<0.02	0	
N-Methyl perfluorooctane sulfonamidoacetic acid (	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0	
N-Methyl perfluorooctane sulfonamidoethanol (Mel	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01	0.46	0.48	4	**0.46**	**0.33**	**33**	
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05	0.1	0.1	0	0.1	0.091	9	
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01	0.02	0.03	40	0.02	<0.01	67	
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0	
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0	
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01	0.36	0.34	6	**0.36**	**0.16**	**77**	
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01	0.13	0.13	0	0.13	0.085	42	
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01	1.05	1.05	0	**1.05**	**0.75**	**33**	
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0	
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01	0.56	0.52	7	**0.56**	**0.3**	**60**	
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	0.19	0.18	5	0.19	0.13	38	
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02	<0.05	<0.05	0	<0.05	<0.02	0	
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0	
Sum of PFAS	µg/L	0.01	23.5	23	2	23.5	12.52	60	
Sum of PFHxS and PFOS	µg/L	0.01	20.3	19.9	2	20.3	10.5	63	
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02	16.1	16	1	**16.1**	**8**	**67**	
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.31	0.3	3	**0.31**	**0.17**	**58**	
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02 : 0.01	4.24	3.89	9	**4.24**	**2.5**	**52**	

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 20(
***Interlab Duplicates are matched on a per compound basis as methods vary bet

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Checked 19/02/2021:

Groundwater RPD Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled Date/Time		3/11/2020	3/11/2020	RPD	3/11/2020	3/11/2020	RPD
	Matrix		Groundwater	Groundwater		Groundwater	Groundwater	
	Lab Report Number		ES2039162	ES2039162		ES2039162	RN1294219	
	Sample Type		Primary	Intralab Duplicate		Primary	Interlab Duplicate	
	Field ID		1302_MW303_201103	1302_QC103_201103		1302_MW303_201103	1302_QC203_201103	
ChemName	**Units**	**EQL**						
PFAS Full Suite								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01	0.11	0.11	0	0.11	0.071	43
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01	<0.05	<0.05	0	<0.05	0.018	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02	<0.05	<0.05	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFO	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02	<0.05	<0.05	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
N-Methyl perfluorooctane sulfonamidoethanol (Mel	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01	5.84	5.89	1	**5.84**	**3.3**	**56**
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05	1	1.2	18	1	1	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01	3.48	3.38	3	**3.48**	**1.8**	**64**
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01	1.52	1.55	2	**1.52**	**0.84**	**58**
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01	12.2	11.8	3	**12.2**	**6.1**	**67**
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01	0.02	<0.02	0	0.02	0.011	58
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01	0.05	0.04	22	0.05	0.014	113
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01	7.24	6.99	4	**7.24**	**3.2**	**77**
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	1.86	1.88	1	**1.86**	**1.3**	**35**
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02	<0.05	<0.05	0	<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01	<0.02	<0.02	0	<0.02	<0.01	0
Sum of PFAS	µg/L	0.01	167	157	6	167	75.454	75
Sum of PFHxS and PFOS	µg/L	0.01	131	121	8	131	56	80
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02	84.8	77	10	**84.8**	**31**	**93**
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	3.12	3.39	8	**3.12**	**1.8**	**54**
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02 : 0.01	46.1	44	5	**46.1**	**25**	**59**

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 20(
***Interlab Duplicates are matched on a per compound basis as methods vary bet

19/02/2021
Checked By: Azrai Parish-Perandis
Checked 19/02/2021:

Surface Water Blanks Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled Date		16/12/2020	16/12/2020	16/12/2020	17/12/2020
	Matrix Type		Water	Water	Water	Water
	Lab Report Number		ES2045380	ES2045380	ES2045380	ES2045380
	Sample Type		Rinsate	Field Blank	Trip Blank	Rinsate
	Field ID		1302_QC300_201216	1302_QC400_201216	1302_QC500_201216	1302_QC301_201217
Chem Name	**Units**	**PQL**				
PFAS Full Suite						
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFO	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (M	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeF	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02

19/02/2021
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Checked 19/02/2021:

Surface Water Blanks Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled Date		17/12/2020	17/12/2020	2/11/2020	2/11/2020	19/01/2021
	Matrix Type		Water	Water	Water	Water	Water
	Lab Report Number		ES2045380	ES2045380	ES2101132	ES2101132	ES2102255
	Sample Type		Field Blank	Trip Blank	Rinsate	Field Blank	Rinsate
	Field ID		1302_QC401_201217	1302_QC501_201217	1302_QC300_201102	1302_QC400_201102	1302_QC300_210119
Chem Name	**Units**	**PQL**					
PFAS Full Suite							
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFO	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (M	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeF	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02

19/02/2021
Checked By: Azrai Parish-Perandis
Checked 19/02/2021:

Surface Water Blanks Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled Date		19/01/2021	19/01/2021	20/01/2021	20/01/2021	19/01/2021
	Matrix Type		Water	Water	Water	Water	Water
	Lab Report Number		ES2102255	ES2102255	ES2102255	ES2102255	ES2102255
	Sample Type		Field Blank	Trip Blank	Rinsate	Field Blank	Trip Blank
	Field ID		1302_QC400_210119	1302_QC500_210119	1302_QC301_210120	1302_QC401_210120	1302_QC501_210120
Chem Name	**Units**	**PQL**					
PFAS Full Suite							
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (Et	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFO	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (M	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeF	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02

19/02/2021
Checked By: Azrai Parish-Perandis
Checked 19/02/2021:

Surface Water RPD Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled Date/Time		16/12/2020	16/12/2020	RPD	16/12/2020	16/12/2020	RPD
	Matrix Type		Surface Water	Surface Water		Surface Water	Surface Water	
	Lab Report Number		ES2045380	ES2045380		ES2045380	RN1299485	
	Sample Type		Primary	Intralab Duplicate		Primary	Interlab Duplicate	
	Field ID		1302_SW104_201216	1302_QC100_201216		1302_SW104_201216	1302_QC200_201216	
ChemName	**Units**	**PQL**						
PFAS Full Suite								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<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
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtF	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOS	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (M	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamidoethanol (MeF	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Sum of PFAS	µg/L	0.01	0.02	<0.01	67	0.02	<0.01	67
Sum of PFHxS and PFOS	µg/L	0.01	0.02	<0.01	67	0.02	<0.01	67
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.02	<0.01	67	0.02	<0.01	67
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0

**High RPDs are in bold (Acceptable RPDs for each PQL multiplier range are: 200 (1-10 x PQL); 50 (10-20 x PQL); 30 (> 20 x PQL))
***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

19/02/2021
Checked By: Azrai Parish-Perandis
Checked 19/02/2021:

Surface Water RPD Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled Date/Time		16/12/2020	16/12/2020	RPD	16/12/2020	16/12/2020	RPD
	Matrix Type		Surface Water	Surface Water		Surface Water	Surface Water	
	Lab Report Number		ES2045380	ES2045380		ES2045380	RN1299485	
	Sample Type		Primary	Intralab Duplicate		Primary	Intralab Duplicate	
	Field ID		1302_SW109_201216	1302_QC101_201216		1302_SW109_201216	1302_QC201_201216	
ChemName	**Units**	**PQL**						
PFAS Full Suite								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<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
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtF	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOS	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (M	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamidoethanol (MeF	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	0	<0.02	0.011	58
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	0.04	0.04	0	0.04	0.02	66
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Sum of PFAS	µg/L	0.01	0.53	0.49	8	0.53	0.31	52
Sum of PFHxS and PFOS	µg/L	0.01	0.49	0.44	11	0.49	0.28	54
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.31	0.28	10	0.31	0.16	63
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	0.01	0	<0.01	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02	0.18	0.16	12	0.18	0.12	40

**High RPDs are in bold (Acceptable RPDs for each PQL multiplier range are: 200
***Interlab Duplicates are matched on a per compound basis as methods vary betv

19/02/2021
Checked By: Azrai Parish-Perandis
Checked 19/02/2021:

Surface Water RPD Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled Date/Time		18/12/2020	18/12/2020	RPD	18/12/2020	18/12/2020	RPD
	Matrix Type		Surface Water	Surface Water		Surface Water	Surface Water	
	Lab Report Number		ES2101132	ES2101132		ES2101132	ES2101132	
	Sample Type		Primary	Intralab Duplicate		Primary	Interlab Duplicate	
	Field ID		1302_SW181_201218	1302_QC102_201218		1302_SW181_201218	1302_QC202_201218	
ChemName	**Units**	**PQL**						
PFAS Full Suite								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	0.09	0.07	25	0.09	0.07	25
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<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
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtF	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOS	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (M	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamidoethanol (MeF	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.1	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	0.03	40	<0.02	0.03	40
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Sum of PFAS	µg/L	0.01	0.47	0.47	0	0.47	0.48	2
Sum of PFHxS and PFOS	µg/L	0.01	0.38	0.37	3	0.38	0.38	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.35	0.34	3	0.35	0.35	0
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02	0.03	0.03	0	0.03	0.03	0

**High RPDs are in bold (Acceptable RPDs for each PQL multiplier range are: 200
***Interlab Duplicates are matched on a per compound basis as methods vary betv

19/02/2021
Checked By: Azrai Parish-Perandis
Checked 19/02/2021:

Surface Water RPD Table
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

	Sampled Date/Time		20/01/2021	20/01/2021	RPD	20/01/2021	20/01/2021	RPD
	Matrix Type		Surface Water	Surface Water		Surface Water	Surface Water	
	Lab Report Number		ES2102255	ES2102255		ES2102255	RN1302294	
	Sample Type		Primary	Intralab Duplicate		Primary	Interlab Duplicate	
	Field ID		1302_SW170_210119	1302_QC100_210119		1302_SW170_210119	1302_QC200_210119	
ChemName	**Units**	**PQL**						
PFAS Full Suite								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.01	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtF	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.01	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOS	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (M	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.01	0
N-Methyl perfluorooctane sulfonamidoethanol (MeF	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	0	<0.1	<0.05	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.01	0
Sum of PFAS	µg/L	0.01	0.33	0.36	9	0.33	0.23	35
Sum of PFHxS and PFOS	µg/L	0.01	0.33	0.36	9	0.33	0.23	35
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.24	0.25	4	**0.24**	**0.16**	40
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02	0.09	0.11	20	0.09	0.066	31

**High RPDs are in bold (Acceptable RPDs for each PQL multiplier range are: 200
***Interlab Duplicates are matched on a per compound basis as methods vary betv

19/02/2021
Checked By: Azrai Parish-Perandis
Checked 19/02/2021:

Appendix D

Chain of Custody

Appendix D Chain of Custody

CHAIN OF CUSTODY

ALS COC#: 15430 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	[redacted] DATE TIME: 6/11/20	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

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: 5.2 C

Other comments:

Environmental Division Sydney
Work Order Reference
ES2039162

Telephone : +61-2-8784 8555

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters - Fresh WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1302_MW194_201102		02/11/2020 10:16 AM	Water	ALS: 4 Non ALS: 0	No	X			
002	1302_MW195_201102		02/11/2020 10:38 AM	Water	ALS: 2 Non ALS: 0	No		X		
003	1302_QC100_201102		02/11/2020 10:40 AM	Water	ALS: 2 Non ALS: 0	No		X		
004	1302_QC200_201102	Please forward to NMI Sydney	02/11/2020 10:41 AM	Water	ALS: 2 Non ALS: 0	Yes				
005	1302_MW193_201102		02/11/2020 11:04 AM	Water	ALS: 2 Non ALS: 0	No		X		
006	1302_MW185_201102		02/11/2020 11:41 AM	Water	ALS: 4 Non ALS: 0	No	X	X		
007	1302_MW210_201102		02/11/2020 12:39 PM	Water	ALS: 2 Non ALS: 0	No		X		
008	1302_MW200_201102		02/11/2020 01:13 PM	Water	ALS: 2 Non ALS: 0	No		X		
009	1302_MW180_201102		02/11/2020 01:35 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 15430 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 6 11/20	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

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: S-2

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters - Fresh WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	1302_MW422_201102		02/11/2020 03:13 PM	Water	ALS: 2 Non ALS: 0	No		X		
011	1302_MW107_201102		02/11/2020 04:38 PM	Water	ALS: 2 Non ALS: 0	No		X		
012	1302_QC101_201102		02/11/2020 04:39 PM	Water	ALS: 2 Non ALS: 0	No		X		
013	1302_QC201_201102	Please forward to NMI Sydney	02/11/2020 04:40 PM	Water	ALS: 2 Non ALS: 0	Yes		-		
014	1302_MW103_201102		02/11/2020 04:53 PM	Water	ALS: 4 Non ALS: 0	No	X			
015	1302_MW141_201102		02/11/2020 05:26 PM	Water	ALS: 2 Non ALS: 0	No		X		
016	1302_MW211_201103		03/11/2020 08:35 AM	Water	ALS: 4 Non ALS: 0	No	X			
017	1302_MW144_201103		03/11/2020 09:08 AM	Water	ALS: 2 Non ALS: 0	No		X		
018	1302_MW205_201103		03/11/2020 09:50 AM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 15430 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 6/11/20	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

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: 5-2 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters - Fresh WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	1302_MW112_201103		03/11/2020 10:17 AM	Water	ALS: 2 Non ALS: 0	No		X		
020	1302_QC102_201103		03/11/2020 10:18 AM	Water	ALS: 2 Non ALS: 0	No		X		
021	1302_QC202_201103	Please forward to NMI Sydney	03/11/2020 10:19 AM	Water	ALS: 2 Non ALS: 0	Yes		-		
022	1302_MW156_201103		03/11/2020 10:34 AM	Water	ALS: 2 Non ALS: 0	No		X		
023	1302_MW115_201103		03/11/2020 10:54 AM	Water	ALS: 2 Non ALS: 0	No		X		
024	1302_MW240_201103		03/11/2020 12:01 PM	Water	ALS: 2 Non ALS: 0	No		X		
025	1302_MW241_201103		03/11/2020 12:02 PM	Water	ALS: 2 Non ALS: 0	No		X		
026	1302_MW197_201103		03/11/2020 01:10 PM	Water	ALS: 2 Non ALS: 0	No		X		
027	1302_MW215_201103		03/11/2020 01:11 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

(ALS) COC#: 15430 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 6/11/20	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

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: 5.2 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters - Fresh WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	1302_MW128_201103		03/11/2020 02:26 PM	Water	ALS: 4 Non ALS: 0	No		X		
029	1302_MW148_201103		03/11/2020 03:00 PM	Water	ALS: 4 Non ALS: 0	No	X			
030	1302_MW303_201103		03/11/2020 03:53 PM	Water	ALS: 4 Non ALS: 0	No	X			low quantity of gen chem
031	1302_QC103_201103		03/11/2020 04:07 PM	Water	ALS: 4 Non ALS: 0	No	X			low quantity of gen chem
032	1302_QC203_201103	Please forward to NMI Sydney	03/11/2020 04:09 PM	Water	ALS: 4 Non ALS: 0	Yes	-			low quantity of gen chem
033	1302_MW191_201103		03/11/2020 04:29 PM	Water	ALS: 4 Non ALS: 0	No	X			
034	1302_MW209_201103		03/11/2020 04:54 PM	Water	ALS: 4 Non ALS: 0	No	X			
035	1302_QC300_201102		03/11/2020 05:50 PM	Water	ALS: 2 Non ALS: 0	No		X		
036	1302_QC400_201102		03/11/2020 05:50 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

(ALS) COC#: **15430** *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 6/11/20	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

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: 5-2 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters - Fresh WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
037	1302_QC500_201102		03/11/2020 05:51 PM	Water	ALS: 2 Non ALS: 0	No		X		
038	1302_QC301_201103		03/11/2020 06:03 PM	Water	ALS: 2 Non ALS: 0	No		X		
039	1302_QC401_201103		03/11/2020 06:04 PM	Water	ALS: 2 Non ALS: 0	No		X		
040	1302_QC501_201103		03/11/2020 06:04 PM	Water	ALS: 2 Non ALS: 0	No		X		
041	1302_MW176_201104		04/11/2020 05:21 PM	Water	ALS: 4 Non ALS: 0	No	X			
042	1302_MW292_201104		04/11/2020 05:52 PM	Water	ALS: 4 Non ALS: 0	No	X			
043	1302_QC302_201104		04/11/2020 06:07 PM	Water	ALS: 2 Non ALS: 0	No		X		
044	1302_QC402_201104		04/11/2020 06:08 PM	Water	ALS: 2 Non ALS: 0	No		X		
045	1302_QC502_201104		04/11/2020 06:35 PM	Water	ALS: 2 Non ALS: 0	No		X		

Rec - 5x trip sample

46 MW139 4/11/20

47 MW297 ↓

48 MW030 ↓

CHAIN OF CUSTODY

ALS COC#: 15430 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: [redacted] 6/11/20	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: 5-2 °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	1302_MW194_201102	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033342	Purple	No	
001	1302_MW194_201102	HDPE (no PTFE)	20 mL	00350019002368	Grey	No	
001	1302_MW194_201102	HDPE (no PTFE)	20 mL	00350019002221	Grey	No	
001	1302_MW194_201102	Clear Plastic Bottle - Natural	500 mL	00071119029355	Green	No	
002	1302_MW195_201102	HDPE (no PTFE)	20 mL	00350019002544	Grey	No	
002	1302_MW195_201102	HDPE (no PTFE)	20 mL	00350019002511	Grey	No	
003	1302_QC100_201102	HDPE (no PTFE)	20 mL	00350019002542	Grey	No	
003	1302_QC100_201102	HDPE (no PTFE)	20 mL	00350019002545	Grey	No	
004	1302_QC200_201102	HDPE (no PTFE)	20 mL	00350019002504	Grey	No	
004	1302_QC200_201102	HDPE (no PTFE)	20 mL	00350019002444	Grey	No	
005	1302_MW193_201102	HDPE (no PTFE)	20 mL	00350019119978	Grey	No	
005	1302_MW193_201102	HDPE (no PTFE)	20 mL	00350019119807	Grey	No	
006	1302_MW185_201102	HDPE (no PTFE)	20 mL	00350019119840	Grey	No	
006	1302_MW185_201102	HDPE (no PTFE)	20 mL	00350019119954	Grey	No	
006	1302_MW185_201102	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033299	Purple	No	
006	1302_MW185_201102	Clear Plastic Bottle - Natural	500 mL	00071119029341	Green	No	
007	1302_MW210_201102	HDPE (no PTFE)	20 mL	00350019119760	Grey	No	
007	1302_MW210_201102	HDPE (no PTFE)	20 mL	00350019119894	Grey	No	
008	1302_MW200_201102	HDPE (no PTFE)	20 mL	00350019002492	Grey	No	
008	1302_MW200_201102	HDPE (no PTFE)	20 mL	00350019002489	Grey	No	
009	1302_MW180_201102	HDPE (no PTFE)	20 mL	00350019119828	Grey	No	
009	1302_MW180_201102	HDPE (no PTFE)	20 mL	00350019119788	Grey	No	
010	1302_MW422_201102	HDPE (no PTFE)	20 mL	00350019002440	Grey	No	
010	1302_MW422_201102	HDPE (no PTFE)	20 mL	00350019002502	Grey	No	
011	1302_MW107_201102	HDPE (no PTFE)	20 mL	00350019002255	Grey	No	
011	1302_MW107_201102	HDPE (no PTFE)	20 mL	00350019002527	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 15430 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 6/11/20	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: 5.2 °C

Other comments:

012	1302_QC101_201102	HDPE (no PTFE)	20 mL	00350019119830	Grey	No	
012	1302_QC101_201102	HDPE (no PTFE)	20 mL	00350019119918	Grey	No	
013	1302_QC201_201102	HDPE (no PTFE)	20 mL	00350019002451	Grey	No	
013	1302_QC201_201102	HDPE (no PTFE)	20 mL	00350019002516	Grey	No	
~~014~~	~~1302_MW103_201102~~	~~Clear Plastic Bottle - Natural~~	~~500 mL~~	~~00071119293083~~	~~Green~~	~~No~~	
014	1302_MW103_201102	HDPE (no PTFE)	20 mL	00350019161134	Grey	No	
014	1302_MW103_201102	HDPE (no PTFE)	20 mL	00350019161218	Grey	No	
014	1302_MW103_201102	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033309	Purple	No	
015	1302_MW141_201102	HDPE (no PTFE)	20 mL	00350019002347	Grey	No	
015	1302_MW141_201102	HDPE (no PTFE)	20 mL	00350019002248	Grey	No	
016	1302_MW211_201103	Clear Plastic Bottle - Natural	500 mL	00071119029296	Green	No	
016	1302_MW211_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033351	Purple	No	
016	1302_MW211_201103	HDPE (no PTFE)	20 mL	00350019002346	Grey	No	
016	1302_MW211_201103	HDPE (no PTFE)	20 mL	00350019002277	Grey	No	
017	1302_MW144_201103	HDPE (no PTFE)	20 mL	00350019002488	Grey	No	
017	1302_MW144_201103	HDPE (no PTFE)	20 mL	00350019002360	Grey	No	
018	1302_MW205_201103	HDPE (no PTFE)	20 mL	00350019002512	Grey	No	
018	1302_MW205_201103	HDPE (no PTFE)	20 mL	00350019002471	Grey	No	
019	1302_MW112_201103	HDPE (no PTFE)	20 mL	00350019119858	Grey	No	
019	1302_MW112_201103	HDPE (no PTFE)	20 mL	00350019119944	Grey	No	
020	1302_QC102_201103	HDPE (no PTFE)	20 mL	00350019119953	Grey	No	
020	1302_QC102_201103	HDPE (no PTFE)	20 mL	00350019119881	Grey	No	
021	1302_QC202_201103	HDPE (no PTFE)	20 mL	00350019002454	Grey	No	
021	1302_QC202_201103	HDPE (no PTFE)	20 mL	00350019002443	Grey	No	
022	1302_MW156_201103	HDPE (no PTFE)	20 mL	00350019002324	Grey	No	
022	1302_MW156_201103	HDPE (no PTFE)	20 mL	00350019002534	Grey	No	
023	1302_MW115_201103	HDPE (no PTFE)	20 mL	00350019002413	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 15430 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 6/11/20	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: 5-2 °C

Other comments:

023	1302_MW115_201103	HDPE (no PTFE)	20 mL	00350019002466	Grey	No	
024	1302_MW240_201103	HDPE (no PTFE)	20 mL	00350019002539	Grey	No	
024	1302_MW240_201103	HDPE (no PTFE)	20 mL	00350019002314	Grey	No	
025	1302_MW241_201103	HDPE (no PTFE)	20 mL	00350019161041	Grey	No	
025	1302_MW241_201103	HDPE (no PTFE)	20 mL	00350019161221	Grey	No	
026	1302_MW197_201103	HDPE (no PTFE)	20 mL	00350019002263	Grey	No	
026	1302_MW197_201103	HDPE (no PTFE)	20 mL	00350019002521	Grey	No	
027	1302_MW215_201103	HDPE (no PTFE)	20 mL	00350019160952	Grey	No	
027	1302_MW215_201103	HDPE (no PTFE)	20 mL	00350019161054	Grey	No	
028	1302_MW128_201103	HDPE (no PTFE)	20 mL	00350019119789	Grey	No	
028	1302_MW128_201103	HDPE (no PTFE)	20 mL	00350019120022	Grey	No	
028	1302_MW128_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033346	Purple	No	
028	1302_MW128_201103	Clear Plastic Bottle - Natural	500 mL	00070719075767	Green	No	
029	1302_MW148_201103	Clear Plastic Bottle - Natural	500 mL	00070719075794	Green	No	
029	1302_MW148_201103	HDPE (no PTFE)	20 mL	00350019119910	Grey	No	
029	1302_MW148_201103	HDPE (no PTFE)	20 mL	00350019119945	Grey	No	
029	1302_MW148_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033296	Purple	No	
030	1302_MW303_201103	Clear Plastic Bottle - Natural	500 mL	00070719075797	Green	No	
030	1302_MW303_201103	HDPE (no PTFE)	20 mL	00350019002376	Grey	No	
030	1302_MW303_201103	HDPE (no PTFE)	20 mL	00350019002525	Grey	No	
030	1302_MW303_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033315	Purple	No	
031	1302_QC103_201103	Clear Plastic Bottle - Natural	500 mL	00070719075803	Green	No	
031	1302_QC103_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033331	Purple	No	
031	1302_QC103_201103	HDPE (no PTFE)	20 mL	00350019120000	Grey	No	
031	1302_QC103_201103	HDPE (no PTFE)	20 mL	00350019120051	Grey	No	
032	1302_QC203_201103	HDPE (no PTFE)	20 mL	00350019002494	Grey	No	
032	1302_QC203_201103	HDPE (no PTFE)	20 mL	00350019002520	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: **15430** *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: [redacted] 6/11/20	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: 5.2 °C

Other comments:

032	1302_QC203_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033298	Purple	No	
032	1302_QC203_201103	Clear Plastic Bottle - Natural	500 mL	00070719075793	Green	No	
033	1302_MW191_201103	HDPE (no PTFE)	20 mL	00350019002438	Grey	No	
033	1302_MW191_201103	HDPE (no PTFE)	20 mL	00350019002281	Grey	No	
~~033~~	~~1302_MW191_201103~~	~~Clear Plastic Bottle - Natural~~	~~500 mL~~	~~00070719075791~~	~~Green~~	~~No~~	
033	1302_MW191_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00180220061932	Purple	No	
034	1302_MW209_201103	HDPE (no PTFE)	20 mL	00350019002496	Grey	No	
034	1302_MW209_201103	HDPE (no PTFE)	20 mL	00350019002228	Grey	No	
034	1302_MW209_201103	Clear Plastic Bottle - Natural	500 mL	00070719075780	Green	No	
034	1302_MW209_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00180220035977	Purple	No	
035	1302_QC300_201102	HDPE (no PTFE)	20 mL	00350019161099	Grey	No	
035	1302_QC300_201102	HDPE (no PTFE)	20 mL	00350019161161	Grey	No	
036	1302_QC400_201102	HDPE (no PTFE)	20 mL	00350019161211	Grey	No	
036	1302_QC400_201102	HDPE (no PTFE)	20 mL	00350019161232	Grey	No	
037	1302_QC500_201102	HDPE (no PTFE)	20 mL	00350019161142	Grey	No	
037	1302_QC500_201102	HDPE (no PTFE)	20 mL	00350019161175	Grey	No	
038	1302_QC301_201103	HDPE (no PTFE)	20 mL	00350019160990	Grey	No	
038	1302_QC301_201103	HDPE (no PTFE)	20 mL	00350019161208	Grey	No	
039	1302_QC401_201103	HDPE (no PTFE)	20 mL	00350019161098	Grey	No	
039	1302_QC401_201103	HDPE (no PTFE)	20 mL	00350019161241	Grey	No	
040	1302_QC501_201103	HDPE (no PTFE)	20 mL	00350019160979	Grey	No	
040	1302_QC501_201103	HDPE (no PTFE)	20 mL	00350019161030	Grey	No	
041	1302_MW176_201104	Clear Plastic Bottle - Natural	500 mL	00071119029339	Green	No	
041	1302_MW176_201104	HDPE (no PTFE)	20 mL	00350019160992	Grey	No	
041	1302_MW176_201104	HDPE (no PTFE)	20 mL	00350019161013	Grey	No	
041	1302_MW176_201104	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018035313	Purple	No	
042	1302_MW292_201104	Clear Plastic Bottle - Natural	500 mL	00071119029356	Green	No	

CHAIN OF CUSTODY

COC#: **15430** *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 6 11/20	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: 5-2 °C

Other comments:

042	1302_MW292_201104	HDPE (no PTFE)	20 mL	00350019043911	Grey	No	
042	1302_MW292_201104	HDPE (no PTFE)	20 mL	00350019044003	Grey	No	
042	1302_MW292_201104	Amber DOC Filtered- Sulfuric Preserved	40 mL	00180220036189	Purple	No	
043	1302_QC302_201104	HDPE (no PTFE)	20 mL	00350019002420	Grey	No	
043	1302_QC302_201104	HDPE (no PTFE)	20 mL	00350019002378	Grey	No	
044	1302_QC402_201104	HDPE (no PTFE)	20 mL	00350019002505	Grey	No	
044	1302_QC402_201104	HDPE (no PTFE)	20 mL	00350019002362	Grey	No	
045	1302_QC502_201104	HDPE (no PTFE)	20 mL	00350019002384	Grey	No	
045	1302_QC502_201104	HDPE (no PTFE)	20 mL	00350019002433	Grey	No	

Total Bottle Count: ALS: 116, Non ALS: 0

11.12.20 Updated CoC 19.11.20 - 4.30pm

AECOM

0990 PAGE 1 of 6 Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
[redacted]

Laboratory Details
Lab. Name: ALS
Lab. Address: 277-289 Woodpark Rd, Smithfield
[redacted]
Lab. Ref:
[redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

Sampled By: [redacted] **Project Name: NT_1302_PFASOMP** **AECOM Project #: 60612561_4.1** **Purchase Order No:**

Specifications: Please report in ESdat format **RE-FREEZE BIOTA SAMPLES**

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	

6. Report Format: ESdat 7. Project Manager: Kim Tregiown

Analysis Request

Environmental Division Sydney
Work Order Reference
ES2040589

Telephone : +61-2-8784 8555

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Matrix:	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	BIOTA - EP231X PFAS - Full Suite (28 Analytes)	HOLD	Notes
1	1302_BIOAFA154_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
2	1302_BIOAFA155_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
3	1302_BIOAFA156_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
4	1302_BIOAFA157_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
5	1302_BIOAFA158_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
6	1302_BIOAFA159_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
7	1302_BIOAFA160_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
8	1302_BIOAFA161_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
9	1302_BIOAFA162_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
10	1302_BIOAFA163_201103	03 Nov 2020	X						X	Snap bag		X	Frozen
11	1302_BIOAFA164_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
12	1302_BIOAFA165_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
13	1302_BIOAFA166_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
14	1302_BIOAFA167_201103	03 Nov 2020	X						X	Snap bag	x		Frozen

Comments: [redacted] Temp. received: °C Report & invoice: [redacted] Lab Report No. Esky ID

Relinquished by: Date: 13/11/2020 Relinquished by: Signed: Date:

Received by: Signed: Date: Received by: Signed: Date:

AECOM **0990 PAGE 2 of 6** **Chain of Custody**

AECOM Australia Pty Ltd Level 21, 420 George Street Sydney, NSW, 2000 PO Box Q410, QVB PO, Sydney, NSW, 1230	**Laboratory Details** Lab. Name: ALS Lab. Address: 277-289 Woodpark Rd, Smithfield Lab. Ref: Fax: Preliminary Report by: Final Report by: Lab Quote No: SY/139/19 v2

Sampled By: **Project Name: NT_1302_PFASOMP** **AECOM Project #: 60612561_4.1** **Purchase Order No:**

Specifications: Please report in ESdat format **RE-FREEZE BIOTA SAMPLES**

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	

6. Report Format: ESdat 7. Project Manager:

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Matrix:	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	Analysis Request: BIOTA - EP231X PFAS - Full Suite (28 Analytes)	Analysis Request: HOLD	Notes
15	1302_BIOAFA168_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
16	1302_BIOAFA169_201103	03 Nov 2020	X						X	Snap bag		x	Frozen
17	1302_BIOAFA170_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
18	1302_BIOAFA171_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
19	1302_BIOAFA172_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
20	1302_BIOAFA173_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
21	1302_BIOAFA174_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
22	1302_BIOAFA175_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
23	1302_BIOAFA176_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
24	1302_BIOAFA177_201103	03 Nov 2020	X						X	Snap bag	x		Frozen
25	1302_BIOAFA178_201104	04 Nov 2020	X						X	Snap bag	x		Frozen
26	1302_BIOAFA179_201104	04 Nov 2020	X						X	Snap bag	x		Frozen
27	1302_BIOAFA180_201104	04 Nov 2020	X						X	Snap bag	x		Frozen
28	1302_BIOAFA181_201104	04 Nov 2020	X						X	Snap bag	x		Frozen

Comments: °C **Report & invoice:** Lab Report No Esky ID

Relinquished by: Date: 13/11/2020 Relinquished by: Signed: Date:

Received by: Signed: Date: Received by: Signed: Date:

AECOM **0990 PAGE 3 of 6** **Chain of Custody**

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
[redacted]

Laboratory Details
Lab. Name: ALS
Lab. Address: 277-289 Woodpark Rd, Smithfield
[redacted]
Lab. Ref:
[redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

Sampled By: [redacted] **Project Name: NT_1302_PFASOMP** **AECOM Project #: 60612561_4.1** **Purchase Order No:**

Specifications: Please report in ESdat format **RE-FREEZE BIOTA SAMPLES**

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	

6. Report Format: ESdat 7. Project Manager:

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Matrix:	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	Analysis Request: BIOTA - EP231X PFAS - Full Suite (28 Analytes)	Analysis Request: HOLD	Notes
29	1302_BIOAFA182_201104	04 Nov 2020	X						X	Snap bag	x		Frozen
30	1302_BIOAFA183_201104	04 Nov 2020	X						X	Snap bag	x		Frozen
31	1302_BIOAFA184_201104	04 Nov 2020	X						X	Snap bag	x		Frozen
32	1302_BIOAFA185_201104	04 Nov 2020	X						X	Snap bag		X	Frozen
33	1302_BIOAFA186_201104	04 Nov 2020	X						X	Snap bag	x		Frozen
34	1302_BIOAFA187_201104	04 Nov 2020	X						X	Snap bag	x		Frozen
35	1302_BIOAFA188_201104	04 Nov 2020	X						X	Snap bag		X	Frozen
36	1302_BIOAFA189_201104	04 Nov 2020	X						X	Snap bag	x		Frozen
37	1302_BIOAFA190_201104	04 Nov 2020	X						X	Snap bag	x		Frozen
38	1302_BIOAFA191_201104	04 Nov 2020	X						X	Snap bag	x		Frozen
39	1302_BIOAFA192_201104	04 Nov 2020	X						X	Snap bag	x		Frozen
40	1302_BIOAFA193_201104	04 Nov 2020	X						X	Snap bag	x		Frozen
41	1302_BIOAFA194_201104	04 Nov 2020	X						X	Snap bag	x		Frozen
42	1302_BIOAFA195_201104	04 Nov 2020	X						X	Snap bag	x		Frozen

Comments: [redacted] Temp. received: °C **Report & invoice:** [redacted] Lab Report No/Esky ID

Relinquished by: [redacted] Date: 13/11/2020 Relinquished by: Signed: Date:

Received by: [redacted] Date: Received by: Signed: Date:

AECOM

 Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
[redacted]

Laboratory Details
Lab. Name: ALS
Lab. Address: 277-289 Woodpark Rd, Smithfield
[redacted]
Lab. Ref:
[redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

Sampled By: [redacted] **Project Name: NT_1302_PFASOMP** **AECOM Project #: 60612561_4.1** **Purchase Order No:**

Specifications: Please report in ESdat format **RE-FREEZE BIOTA SAMPLES**

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	

6. Report Format: ESdat 7. Project Manager:

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Matrix:	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	BIOTA - EP231X	PFAS - Full Suite (28 Analytes)	HOLD	Notes
43	1302_BIOAFA196_201107	07 Nov 2020	X						X	Snap bag		x		Frozen
44	1302_BIOAFA197_201107	07 Nov 2020	X						X	Snap bag		x		Frozen
45	1302_BIOAFA198_201107	07 Nov 2020	X						X	Snap bag			X	Frozen
46	1302_BIOAFA199_201108	08 Nov 2020	X						X	Snap bag		x		Please combine BIOAFA199 and BIOAFA200, and keep ID as BIOFA199
47	1302_BIOAFA200_201108	08 Nov 2020	X						X	Snap bag				
48	1302_BIOAFA201_201112	12 Nov 2020	X						X	Snap bag		x		Frozen
49	1302_BIOAFA202_201112	12 Nov 2020	X						X	Snap bag		x		Please combine BIOAFA202 and BIOAFA203, and keep ID as BIOFA202
50	1302_BIOAFA203_201112	12 Nov 2020	X						X	Snap bag				

199

202

Comments: [redacted] Temp. received: °C **Report & invoice** [redacted] Lab Report No/Esky ID

Relinquished by: Date: 13/11/2020 Relinquished by: Signed: Date:

Received by: Signed: Date: Received by: Signed: Date:

AECOM

0990 PAGE 5 of 6 **Chain of Custody** [redacted]

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230

[redacted]

Laboratory Details
Lab. Name: ALS
Lab. Address: 277-289 Woodpark Rd, Smithfield
[redacted]
Lab. Ref:

Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

Sampled By: [redacted]
Project Name: NT_1302_PFASOMP
AECOM Project #: 60612561_4.1
Purchase Order No:

Specifications: Please report in ESdat format **RE-FREEZE BIOTA SAMPLES**

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	

6. Report Format: ESdat
7. Project Manager:

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix biota	Matrix water	Matrix	Preservation filt'ed	Preservation acid	Preservation ice	Preservation frozen	Container (No. & type)	BIOTA - EP231X PFAS - Full Suite (28 Analytes)	WATER PFAS - Full Suite (28 Analytes)	HOLD	Notes
51	1302_QC121_201103	03 Nov 2020		X				X		Bottle		x		Surface Water
52	1302_QC122_201103	03 Nov 2020	X						X	Snap bag	x			Frozen
53	1302_QC123_201103	03 Nov 2020	X						X	Snap bag	x			Frozen
54	1302_QC124_201103	03 Nov 2020	X						X	Snap bag			x	Frozen
55	1302_QC125_201103	03 Nov 2020	X						X	Snap bag			x	Frozen
56	1302_QC126_201104	04 Nov 2020	X						X	Snap bag	x			Frozen
57	1302_QC127_201104	04 Nov 2020	X						X	Snap bag			x	Frozen
58	1302_QC128_201104	04 Nov 2020	X						X	Snap bag	x			Frozen
59	1302_QC129_201104	04 Nov 2020	X						X	Snap bag	x			Frozen
60	1302_QC302_201105	05 Nov 2020		X				X		Bottle		x		Rinsate
61	1302_QC502_201106	06 Nov 2020		X				X		Bottle		x		Trip Blank

Comments: [redacted]
Temp. received: °C
Report & invoice: [redacted]
Lab Report No
Esky ID

Relinquished by: [redacted] Signed: Date: 13/11/2020
Received by: Signed: Date:
Relinquished by: Signed: Date:
Received by: Signed: Date:

AECOM

0990 PAGE 6 of 6 Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
[redacted]

Laboratory Details
Lab. Name: ALS
Lab. Address: 277-289 Woodpark Rd, Smithfield
[redacted]
Lab. Ref:

[redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

Sampled By: [redacted]

Project Name: NT_1302_PFASOMP

AECOM Project #: 60612561_4.1

Purchase Order No:

Specifications: Please report in ESdat format **KEEP COOL**

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: KEEP COOL)	

6. Report Format: ESdat
7. Project Manager:

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Matrix:	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	WATER PFAS - Full Suite (28 Analytes)	HOLD	Notes
62	1302_SW007_201103	03 Nov 2020		X				X		Bottle	x		Surface Water
63	1302_SW008_201104	04 Nov 2020		X				X		Bottle	x		Surface Water
64	1302_SW009_201103	03 Nov 2020		X				X		Bottle	x		Surface Water
65	1302_SW010_201107	07 Nov 2020		X				X		Bottle	x		Surface Water
66	1302_SW011_201107	07 Nov 2020		X				X		Bottle	x		Surface Water
67	1302_SW012_201107	07 Nov 2020		X				X		Bottle	x		Surface Water

Comments: [redacted]

Temp. received: °C

Report & invoice: [redacted]

Lab Report No/Esky ID

Relinquished by: [redacted] Signed: Date: 13/11/2020

Received by: Signed: Date:

Relinquished by: Signed: Date:

Received by: Signed: Date:

05.01.12

AECOM **1302 PAGE 1 of 21 Chain of Custody**

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
[redacted]

Laboratory Details
Lab. Name: ALS
Lab. Address: 277-289 Woodpark Rd, Smithfield
[redacted]
Lab. Ref:

[redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

AECOM Project #: 60612561 **Purchase Order No:**

Specifications: Please report in ESdat format

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	

6. Report Format: ESdat 7. Project Manager:

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Matrix:	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	PFAS Waters WATER	Surface Waters WATER	HOLD	Notes
1	1302_SW112_201216	16/12/2020 9:50		X				X			X		X	
2	1302_SW113_201216	16/12/2020 10:05		X				X			X		X	
3	1302_SW125_201216	16/12/2020 10:27		X				X			X		X	
4	1302_SW120_201216	16/12/2020 10:45		X				X			X		X	
5	1302_SW124_201216	16/12/2020 11:00		X				X			X	X	X	
6	1302_SW114_201216	16/12/2020 12:15		X				X			X	X	X	
7	1302_SW104_201216	16/12/2020 14:00		X				X			X		X	
8	1302_SW115_201216	16/12/2020 14:15		X				X			X	X	X	
9	1302_SW106_201216	16/12/2020 14:30		X				X			X		X	
10	1302_SW108_201216	16/12/2020 14:50		X				X			X		X	
11	1302_SW109_201216	16/12/2020 15:55		X				X			X		X	
12	1302_SW168_201216	16/12/2020 16:20		X				X			X	X	X	
13	1302_SW132_201217	17/12/2020 10:20		X				X			X		X	
14	1302_SW133_201217	17/12/2020 10:50		X				X			X	X	X	

LABELLED BY LOCATION NAME ONLY. NO SITE OR DATE USED IN SAMPLE BOTTLE NAMING CONVENTION. IN LAB REPORTS PLEASE USE WHAT IS ON THE COC. PLEASE INCORPORATE SAMPLING TIMES INTO THE REPORTS AND ESDAT FILES.

Comments: [redacted]

Temp. received: ice 17.6°C °C

Report & invoice: [redacted]

Relinquished by: [redacted] Signed: [redacted] Date: 21/12/20

Received by: [redacted] Signed: [redacted] 10:00 am Date: 21/12/20

Relinquished by: Signed:

Received by: Signed:

Environmental Division
Sydney
Work Order Reference
ES2045380

Telephone : + 61-2-8784 8555

LAB OF ORIGIN: DARWIN

AECOM **1302 PAGE 2 of 2 Chain of Custody**

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
[redacted]

Laboratory Details
Lab. Name: ALS
Lab. Address: 277-289 Woodpark Rd, Smithfield
[redacted]
Lab. Ref:
[redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

Sampled By: [redacted]
AECOM Project #: 60612561
Purchase Order No:

Specifications: Please report in ESdat format

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	
6. Report Format: ESdat	7. Project Manager:

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	PFAS Waters WATER	Surface Waters WATER	HOLD	Notes
15	1302_SW143_201217	17/12/2020 11:05		X			X			X	X	X	
16	1302_QC100_201216	16/12/2020 0:00		X			X			X		X	
-	1302_QC200_201216-FORWARD	16/12/2020 0:00		X			X			X	NMI SYDNEY	X	
17	1302_QC300_201216	16/12/2020 0:00		X			X			X		X	
18	1302_QC400_201216	16/12/2020 0:00		X			X			X		X	
19	1302_QC500_201216	16/12/2020 0:00		X			X			X		X	
20	1302_QC101_201216	16/12/2020 0:00		X			X			X		X	
-	1302_QC201_201216-FORWARD	16/12/2020 0:00		X			X			X	NMI SYDNEY	X	
21	1302_QC301_201217 (302)	17/12/2020 0:00		X			X			X		X	
22	1302_QC401_201217 (402)	17/12/2020 0:00		X			X			X		X	
23	1302_QC501_201217 (502)	17/12/2020 0:00		X			X			X		X	
24 NR	1302_SW181_201218	18/12/2020 15:25		X			X			X	X	X	
25 NR	1302_QC102_201218	18/12/2020 15:25		X			X			X		X	
- NR	1302_QC202_201218 FORWARD	18/12/2020 15:25		X			X			X	- NMI SYDNEY	X	

LABELLED BY LOCATION NAME ONLY ON SAMPLE BOTTLES. NO SITE OR DATE USED IN SAMPLE BOTTLE NAMING CONVENTION. IN LAB REPORTS PLEASE USE WHAT IS ON THE COC. PLEASE INCORPORATE SAMPLING TIMES INTO THE REPORTS AND ESDAT FILES, IF PROVIDED.

Comments: **Please send ESdat files to DERP.labreports@esdat.com.au and ensure that the files use the PROJECT NAME**

Temp. received: °C

Report & invoice: APCORP.ANZ@aecom.com

Lab Report No | Esky ID

Relinquished by: [redacted] Signed: [redacted] Date: 21/12/20
Received by: Signed: Date:

Relinquished by: Signed: Date:
Received by: Signed: Date:

ANZ

Chain of Custody Form

Environmental Division
Sydney
Work Order Reference
ES2101132

AECOM

Q4AN(EV)-335-FM60

Telephone + 61-2-8784 8555

AECOM - Darwin
PO Box 3175
Darwin NT 0801

[redacted]

Laboratory Details
Lab. Name: ALS
Lab. Address: 277-289 Woodpark Rd, Smithfield
Contact Name: Chris Redford
Lab. Ref:
Tel:
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Project Name: PFAS OMP
Project Number: 60647267
Purchase Order Number: 60647267
Sample collected by: [redacted]
Sample Results to be returned to: [redacted]

Specifications: Please report in Esdat format

	(Tick)		
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	☑ Yes	☐ No	☐ N/A
2. Fast TAT Guarantee Required?	☑ Yes	☐ No	☐ N/A
3. Is any sediment layer present in waters to be excluded from extractions?	☐ Yes	☐ No	☑ N/A
4. Special storage requirements?	☑ Yes	☐ No	☐ N/A
5. Preservation requirements?	☑ Yes	☐ No	☐ N/A
6. Other requirements?	☑ Yes	☐ No	☐ N/A

7. Report Format: ☐ Fax ☐ Hard copy ☑ Email ☑ Esdat
8. Project Manager: tel: 0428 420 162

SW 181 ←

Lab. ID	Sample ID	Sampling Date & time (on)	Sampling Date & Time (off)	Matrix: soil	Matrix: water	Matrix: other	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	Analysis Request: PFAS Full Suite (28 Analytes)	Remarks & comments
1	SW162	18/12/2020			X				X			X	
2	SW1[illegible]	18/12/2020			X				X			X	
3	QC102	18/12/2020			X				X			X	
4	QC202	18/12/2020			X				X			X	
5	QC300	2/11/2020			X				X			X	
6	QC400	2/11/2020			X				X			X	

Please hold any remaining soil for leachate tests if required following analysis.

Relinquished By:		Received by:	
Name:	Date:	Name:	Date:
of: AECOM Australia Pty Ltd	Time:	of:	Time:
Relinquished By:		**Received by:** FAS [redacted] 14/1/21	
Name:	Date:	Name:	Date:
of:	Time:	of:	Time: 10:40

Received in good	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	
Received in good	Yes/No/NA	Method of Shipment	
Samples received chilled?	Yes/No/NA	Consignment Note No.	
	Yes/No/NA	Transport Co:	

CHAIN OF CUSTODY

ALS COC#: 18085 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: NT_1302_PFASOMP

SITE: NT_1302_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY: [redacted]	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 22/1/21 1405	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: 10.2 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1302_SW162_210120		20/01/2021 03:11 PM	Water	ALS: 2 Non ALS: 0	No	X		
002	1302_SW150_210119		20/01/2021 03:12 PM	Water	ALS: 2 Non ALS: 0	No	X		
003	1302_SW188_210119		20/01/2021 03:13 PM	Water	ALS: 2 Non ALS: 0	No	X		
004	1302_SW170_210119		20/01/2021 03:13 PM	Water	ALS: 2 Non ALS: 0	No	X		
005	1302_SW181_210120		20/01/2021 03:15 PM	Water	ALS: 2 Non ALS: 0	No	X		
006	1302_SW178_210120		20/01/2021 03:16 PM	Water	ALS: 2 Non ALS: 0	No	X		
007	1302_QC100_210119		20/01/2021 03:16 PM	Water	ALS: 2 Non ALS: 0	No	X		
008	1302_QC200_210119	Please forward to nmi for analysis	20/01/2021 03:17 PM	Water	ALS: 2 Non ALS: 0	Yes	-		
009	1302_QC300_210119		20/01/2021 03:18 PM	Water	ALS: 2 Non ALS: 0	No	X		

Environmental Division
Sydney
Work Order Reference
ES2102255

Telephone : +61-2-8784 8555

CHAIN OF CUSTODY

ALS COC#: 18085 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: NT_1302_PFASOMP

SITE: NT_1302_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: [redacted] 22/11/21 1405	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: 10-2c °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	1302_QC400_210119		20/01/2021 03:18 PM	Water	ALS: 2 Non ALS: 0	No	X		
011	1203_QC500_210119		20/01/2021 03:19 PM	Water	ALS: 2 Non ALS: 0	No	X		
012	1302_QC301_210120		20/01/2021 03:20 PM	Water	ALS: 2 Non ALS: 0	No	X		
013	1302_QC401_210120		20/01/2021 03:22 PM	Water	ALS: 2 Non ALS: 0	No	X		
014	1302_QC501_210120		19/01/2021 04:50 PM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 18085 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	[redacted] DATE TIME: 22/1/21 1405	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: NT_1302_PFASOMP

SITE: NT_1302_PFASOMP

ORDER NO: 60612561 4.1

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: 10-2 °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	1302_SW162_210120	HDPE (no PTFE)	20 mL	00350019161148	Grey	No	
001	1302_SW162_210120	HDPE (no PTFE)	20 mL	00350019161116	Grey	No	
002	1302_SW150_210119	HDPE (no PTFE)	20 mL	00350019043818	Grey	No	
002	1302_SW150_210119	HDPE (no PTFE)	20 mL	00350019043997	Grey	No	
003	1302_SW188_210119	HDPE (no PTFE)	20 mL	00350019043866	Grey	No	
003	1302_SW188_210119	HDPE (no PTFE)	20 mL	00350019043954	Grey	No	
004	1302_SW170_210119	HDPE (no PTFE)	20 mL	00350019179922	Grey	No	
004	1302_SW170_210119	HDPE (no PTFE)	20 mL	00350019180197	Grey	No	
005	1302_SW181_210120	HDPE (no PTFE)	20 mL	00350019179933	Grey	No	
005	1302_SW181_210120	HDPE (no PTFE)	20 mL	00350019180022	Grey	No	
006	1302_SW178_210120	HDPE (no PTFE)	20 mL	00350019125881	Grey	No	
006	1302_SW178_210120	HDPE (no PTFE)	20 mL	00350019126389	Grey	No	
007	1302_QC100_210119	HDPE (no PTFE)	20 mL	00350019180112	Grey	No	
007	1302_QC100_210119	HDPE (no PTFE)	20 mL	00350019180094	Grey	No	
008	1302_QC200_210119	HDPE (no PTFE)	20 mL	00350019044052	Grey	No	
008	1302_QC200_210119	HDPE (no PTFE)	20 mL	00350019043785	Grey	No	
009	1302_QC300_210119	HDPE (no PTFE)	20 mL	00350019145830	Grey	No	
009	1302_QC300_210119	HDPE (no PTFE)	20 mL	00350019145648	Grey	No	
010	1302_QC400_210119	HDPE (no PTFE)	20 mL	00350019126385	Grey	No	
010	1302_QC400_210119	HDPE (no PTFE)	20 mL	00350019125960	Grey	No	
011	1203_QC500_210119	HDPE (no PTFE)	20 mL	00350019180016	Grey	No	
011	1203_QC500_210119	HDPE (no PTFE)	20 mL	00350019180215	Grey	No	
012	1302_QC301_210120	HDPE (no PTFE)	20 mL	00350019043959	Grey	No	
012	1302_QC301_210120	HDPE (no PTFE)	20 mL	00350019043872	Grey	No	
013	1302_QC401_210120	HDPE (no PTFE)	20 mL	00350019180046	Grey	No	
013	1302_QC401_210120	HDPE (no PTFE)	20 mL	00350019180098	Grey	No	

CHAIN OF CUSTODY

COC#: **18085** *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 22/1/21 1405	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: NT_1302_PFASOMP

SITE: NT_1302_PFASOMP

ORDER NO: 60612561 4.1

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 / [redacted] esent upon receipt? Yes No N/A

Random Sample Temperature on Receipt: 10.2 °C

Other comments:

014	1302_QC501_210120	HDPE (no PTFE)	20 mL	00350019043977	Grey	No	
014	1302_QC501_210120	HDPE (no PTFE)	20 mL	00350019043835	Grey	No	

Total Bottle Count: ALS: 28, Non ALS: 0

CHAIN OF CUSTODY

COC#: 15430 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	[redacted] DATE TIME: 6/11/20	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

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: 5.2 °C

Other comments:

AECOQ6/201109/1

Due ~~16/11/20~~ 17/11/2020

Environmental Division Sydney
Work Order Reference
ES2039162

Telephone : +61-2-8784 8555

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters - Fresh WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1302_MW194_201102		02/11/2020 10:16 AM	Water	ALS: 4 Non ALS: 0	No	X			
002	1302_MW195_201102		02/11/2020 10:38 AM	Water	ALS: 2 Non ALS: 0	No		X		
003	1302_QC100_201102		02/11/2020 10:40 AM	Water	ALS: 2 Non ALS: 0	No		X		
004	1302_QC200_201102	Please forward to NMI Sydney	02/11/2020 10:41 AM	Water	ALS: 2 Non ALS: 0	Yes				N20/026407
005	1302_MW193_201102		02/11/2020 11:04 AM	Water	ALS: 2 Non ALS: 0	No		X		
006	1302_MW185_201102		02/11/2020 11:41 AM	Water	ALS: 4 Non ALS: 0	No	X	X		
007	1302_MW210_201102		02/11/2020 12:39 PM	Water	ALS: 2 Non ALS: 0	No		X		
008	1302_MW200_201102		02/11/2020 01:13 PM	Water	ALS: 2 Non ALS: 0	No		X		
009	1302_MW180_201102		02/11/2020 01:35 PM	Water	ALS: 2 Non ALS: 0	No		X		

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09 NOV 2020
BY: .....

CHAIN OF CUSTODY

COC#: 15430 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	[redacted] DATE TIME: 6/11/20	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

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: 5-2 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters - Fresh WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	1302_MW422_201102		02/11/2020 03:13 PM	Water	ALS: 2 Non ALS: 0	No		X		
011	1302_MW107_201102		02/11/2020 04:38 PM	Water	ALS: 2 Non ALS: 0	No		X		
012	1302_QC101_201102		02/11/2020 04:39 PM	Water	ALS: 2 Non ALS: 0	No		X		
013	1302_QC201_201102	Please forward to NMI Sydney	02/11/2020 04:40 PM	Water	ALS: 2 Non ALS: 0	Yes		-		N20/026408
014	1302_MW103_201102		02/11/2020 04:53 PM	Water	ALS: 4 Non ALS: 0	No	X			
015	1302_MW141_201102		02/11/2020 05:26 PM	Water	ALS: 2 Non ALS: 0	No		X		
016	1302_MW211_201103		03/11/2020 08:35 AM	Water	ALS: 4 Non ALS: 0	No	X			
017	1302_MW144_201103		03/11/2020 09:08 AM	Water	ALS: 2 Non ALS: 0	No		X		
018	1302_MW205_201103		03/11/2020 09:50 AM	Water	ALS: 2 Non ALS: 0	No		X		

RECEIVED
09 NOV 2020
BY: .....

CHAIN OF CUSTODY

COC#: **15430** *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	[redacted] DATE TIME: 6/11/20	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: 5.2 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters - Fresh WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	1302_MW112_201103		03/11/2020 10:17 AM	Water	ALS: 2 Non ALS: 0	No		X		
020	1302_QC102_201103		03/11/2020 10:18 AM	Water	ALS: 2 Non ALS: 0	No		X		
021	1302_QC202_201103	Please forward to NMI Sydney	03/11/2020 10:19 AM	Water	ALS: 2 Non ALS: 0	Yes		-		N20/026409
022	1302_MW156_201103		03/11/2020 10:34 AM	Water	ALS: 2 Non ALS: 0	No		X		
023	1302_MW115_201103		03/11/2020 10:54 AM	Water	ALS: 2 Non ALS: 0	No		X		
024	1302_MW240_201103		03/11/2020 12:01 PM	Water	ALS: 2 Non ALS: 0	No		X		
025	1302_MW241_201103		03/11/2020 12:02 PM	Water	ALS: 2 Non ALS: 0	No		X		
026	1302_MW197_201103		03/11/2020 01:10 PM	Water	ALS: 2 Non ALS: 0	No		X		
027	1302_MW215_201103		03/11/2020 01:11 PM	Water	ALS: 2 Non ALS: 0	No		X		

RECEIVED
09 NOV 2020
BY:

CHAIN OF CUSTODY

COC#: 15430 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	[redacted] DATE TIME: 6/11/20	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

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: 5.2 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters - Fresh WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	1302_MW128_201103		03/11/2020 02:26 PM	Water	ALS: 4 Non ALS: 0	No		X		
029	1302_MW148_201103		03/11/2020 03:00 PM	Water	ALS: 4 Non ALS: 0	No	X			
030	1302_MW303_201103		03/11/2020 03:53 PM	Water	ALS: 4 Non ALS: 0	No	X			low quantity of gen chem
031	1302_QC103_201103		03/11/2020 04:07 PM	Water	ALS: 4 Non ALS: 0	No	X			low quantity of gen chem
032	1302_QC203_201103	Please forward to NMI Sydney	03/11/2020 04:09 PM	Water	ALS: 4 Non ALS: 0	Yes	-	N20/026410		low quantity of gen chem
033	1302_MW191_201103		03/11/2020 04:29 PM	Water	ALS: 4 Non ALS: 0	No	X			
034	1302_MW209_201103		03/11/2020 04:54 PM	Water	ALS: 4 Non ALS: 0	No	X			
035	1302_QC300_201102		03/11/2020 05:50 PM	Water	ALS: 2 Non ALS: 0	No		X		
036	1302_QC400_201102		03/11/2020 05:50 PM	Water	ALS: 2 Non ALS: 0	No		X		

RECEIVED
09 NOV 2020
BY: .....

* Recvd. (1) VIAL
(1) 500 mL PLASTIC (NO ML)
(2) PFAS BOTTLE

CHAIN OF CUSTODY

COC#: **15430** *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 6/11/20	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: 5.2 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Ground Waters - Fresh WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
037	1302_QC500_201102		03/11/2020 05:51 PM	Water	ALS: 2 Non ALS: 0	No		X		
038	1302_QC301_201103		03/11/2020 06:03 PM	Water	ALS: 2 Non ALS: 0	No		X		
039	1302_QC401_201103		03/11/2020 06:04 PM	Water	ALS: 2 Non ALS: 0	No		X		
040	1302_QC501_201103		03/11/2020 06:04 PM	Water	ALS: 2 Non ALS: 0	No		X		
041	1302_MW176_201104		04/11/2020 05:21 PM	Water	ALS: 4 Non ALS: 0	No	X			
042	1302_MW292_201104		04/11/2020 05:52 PM	Water	ALS: 4 Non ALS: 0	No	X			
043	1302_QC302_201104		04/11/2020 06:07 PM	Water	ALS: 2 Non ALS: 0	No		X		
044	1302_QC402_201104		04/11/2020 06:08 PM	Water	ALS: 2 Non ALS: 0	No		X		
045	1302_QC502_201104		04/11/2020 06:35 PM	Water	ALS: 2 Non ALS: 0	No		X		

Rec: Extra sample

46 MW139 4/11/20

47 MW297

48 MW030

CHAIN OF CUSTODY

COC#: 15430 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: [redacted] 6 Nov 20	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: 5-2 °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	1302_MW194_201102	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033342	Purple	No	
001	1302_MW194_201102	HDPE (no PTFE)	20 mL	00350019002368	Grey	No	
001	1302_MW194_201102	HDPE (no PTFE)	20 mL	00350019002221	Grey	No	
001	1302_MW194_201102	Clear Plastic Bottle - Natural	500 mL	00071119029355	Green	No	
002	1302_MW195_201102	HDPE (no PTFE)	20 mL	00350019002544	Grey	No	
002	1302_MW195_201102	HDPE (no PTFE)	20 mL	00350019002511	Grey	No	
003	1302_QC100_201102	HDPE (no PTFE)	20 mL	00350019002542	Grey	No	
003	1302_QC100_201102	HDPE (no PTFE)	20 mL	00350019002545	Grey	No	
004	1302_QC200_201102	HDPE (no PTFE)	20 mL	00350019002504	Grey	No	
004	1302_QC200_201102	HDPE (no PTFE)	20 mL	00350019002444	Grey	No	
005	1302_MW193_201102	HDPE (no PTFE)	20 mL	00350019119978	Grey	No	
005	1302_MW193_201102	HDPE (no PTFE)	20 mL	00350019119807	Grey	No	
006	1302_MW185_201102	HDPE (no PTFE)	20 mL	00350019119840	Grey	No	
006	1302_MW185_201102	HDPE (no PTFE)	20 mL	00350019119954	Grey	No	
006	1302_MW185_201102	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033299	Purple	No	
006	1302_MW185_201102	Clear Plastic Bottle - Natural	500 mL	00071119029341	Green	No	
007	1302_MW210_201102	HDPE (no PTFE)	20 mL	00350019119760	Grey	No	
007	1302_MW210_201102	HDPE (no PTFE)	20 mL	00350019119894	Grey	No	
008	1302_MW200_201102	HDPE (no PTFE)	20 mL	00350019002492	Grey	No	
008	1302_MW200_201102	HDPE (no PTFE)	20 mL	00350019002489	Grey	No	
009	1302_MW180_201102	HDPE (no PTFE)	20 mL	00350019119828	Grey	No	
009	1302_MW180_201102	HDPE (no PTFE)	20 mL	00350019119788	Grey	No	
010	1302_MW422_201102	HDPE (no PTFE)	20 mL	00350019002440	Grey	No	
010	1302_MW422_201102	HDPE (no PTFE)	20 mL	00350019002502	Grey	No	
011	1302_MW107_201102	HDPE (no PTFE)	20 mL	00350019002255	Grey	No	
011	1302_MW107_201102	HDPE (no PTFE)	20 mL	00350019002527	Grey	No	

CHAIN OF CUSTODY

COC#: 15430 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 6/11/20	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: 5.2 °C

Other comments:

012	1302_QC101_201102	HDPE (no PTFE)	20 mL	00350019119830	Grey	No	
012	1302_QC101_201102	HDPE (no PTFE)	20 mL	00350019119918	Grey	No	
013	1302_QC201_201102	HDPE (no PTFE)	20 mL	00350019002451	Grey	No	
013	1302_QC201_201102	HDPE (no PTFE)	20 mL	00350019002516	Grey	No	
~~014~~	~~1302_MW103_201102~~	~~Clear Plastic Bottle - Natural~~	~~500 mL~~	~~00071119293083~~	~~Green~~	~~No~~	
014	1302_MW103_201102	HDPE (no PTFE)	20 mL	00350019161134	Grey	No	
014	1302_MW103_201102	HDPE (no PTFE)	20 mL	00350019161218	Grey	No	
014	1302_MW103_201102	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033309	Purple	No	
015	1302_MW141_201102	HDPE (no PTFE)	20 mL	00350019002347	Grey	No	
015	1302_MW141_201102	HDPE (no PTFE)	20 mL	00350019002248	Grey	No	
016	1302_MW211_201103	Clear Plastic Bottle - Natural	500 mL	00071119029296	Green	No	
016	1302_MW211_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033351	Purple	No	
016	1302_MW211_201103	HDPE (no PTFE)	20 mL	00350019002346	Grey	No	
016	1302_MW211_201103	HDPE (no PTFE)	20 mL	00350019002277	Grey	No	
017	1302_MW144_201103	HDPE (no PTFE)	20 mL	00350019002488	Grey	No	
017	1302_MW144_201103	HDPE (no PTFE)	20 mL	00350019002360	Grey	No	
018	1302_MW205_201103	HDPE (no PTFE)	20 mL	00350019002512	Grey	No	
018	1302_MW205_201103	HDPE (no PTFE)	20 mL	00350019002471	Grey	No	
019	1302_MW112_201103	HDPE (no PTFE)	20 mL	00350019119858	Grey	No	
019	1302_MW112_201103	HDPE (no PTFE)	20 mL	00350019119944	Grey	No	
020	1302_QC102_201103	HDPE (no PTFE)	20 mL	00350019119953	Grey	No	
020	1302_QC102_201103	HDPE (no PTFE)	20 mL	00350019119881	Grey	No	
021	1302_QC202_201103	HDPE (no PTFE)	20 mL	00350019002454	Grey	No	
021	1302_QC202_201103	HDPE (no PTFE)	20 mL	00350019002443	Grey	No	
022	1302_MW156_201103	HDPE (no PTFE)	20 mL	00350019002324	Grey	No	
022	1302_MW156_201103	HDPE (no PTFE)	20 mL	00350019002534	Grey	No	
023	1302_MW115_201103	HDPE (no PTFE)	20 mL	00350019002413	Grey	No	

CHAIN OF CUSTODY

COC#: 15430 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: [redacted] 6/11/20	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: 5-2 °C

Other comments:

023	1302_MW115_201103	HDPE (no PTFE)	20 mL	00350019002466	Grey	No	
024	1302_MW240_201103	HDPE (no PTFE)	20 mL	00350019002539	Grey	No	
024	1302_MW240_201103	HDPE (no PTFE)	20 mL	00350019002314	Grey	No	
025	1302_MW241_201103	HDPE (no PTFE)	20 mL	00350019161041	Grey	No	
025	1302_MW241_201103	HDPE (no PTFE)	20 mL	00350019161221	Grey	No	
026	1302_MW197_201103	HDPE (no PTFE)	20 mL	00350019002263	Grey	No	
026	1302_MW197_201103	HDPE (no PTFE)	20 mL	00350019002521	Grey	No	
027	1302_MW215_201103	HDPE (no PTFE)	20 mL	00350019160952	Grey	No	
027	1302_MW215_201103	HDPE (no PTFE)	20 mL	00350019161054	Grey	No	
028	1302_MW128_201103	HDPE (no PTFE)	20 mL	00350019119789	Grey	No	
028	1302_MW128_201103	HDPE (no PTFE)	20 mL	00350019120022	Grey	No	
028	1302_MW128_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033346	Purple	No	
028	1302_MW128_201103	Clear Plastic Bottle - Natural	500 mL	00070719075767	Green	No	
029	1302_MW148_201103	Clear Plastic Bottle - Natural	500 mL	00070719075794	Green	No	
029	1302_MW148_201103	HDPE (no PTFE)	20 mL	00350019119910	Grey	No	
029	1302_MW148_201103	HDPE (no PTFE)	20 mL	00350019119945	Grey	No	
029	1302_MW148_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033296	Purple	No	
030	1302_MW303_201103	Clear Plastic Bottle - Natural	500 mL	00070719075797	Green	No	
030	1302_MW303_201103	HDPE (no PTFE)	20 mL	00350019002376	Grey	No	
030	1302_MW303_201103	HDPE (no PTFE)	20 mL	00350019002525	Grey	No	
030	1302_MW303_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033315	Purple	No	
031	1302_QC103_201103	Clear Plastic Bottle - Natural	500 mL	00070719075803	Green	No	
031	1302_QC103_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033331	Purple	No	
031	1302_QC103_201103	HDPE (no PTFE)	20 mL	00350019120000	Grey	No	
031	1302_QC103_201103	HDPE (no PTFE)	20 mL	00350019120051	Grey	No	
032	1302_QC203_201103	HDPE (no PTFE)	20 mL	00350019002494	Grey	No	
032	1302_QC203_201103	HDPE (no PTFE)	20 mL	00350019002520	Grey	No	

CHAIN OF CUSTODY

COC#: 15430 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: [redacted] 6/11/20	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: 5.2 °C

Other comments:

032	1302_QC203_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018033298	Purple	No	
032	1302_QC203_201103	Clear Plastic Bottle - Natural	500 mL	00070719075793	Green	No	
033	1302_MW191_201103	HDPE (no PTFE)	20 mL	00350019002438	Grey	No	
033	1302_MW191_201103	HDPE (no PTFE)	20 mL	00350019002281	Grey	No	
~~033~~	~~1302_MW191_201103~~	~~Clear Plastic Bottle - Natural~~	~~500 mL~~	~~00070719075791~~	~~Green~~	~~No~~	
033	1302_MW191_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00180220061932	Purple	No	
034	1302_MW209_201103	HDPE (no PTFE)	20 mL	00350019002496	Grey	No	
034	1302_MW209_201103	HDPE (no PTFE)	20 mL	00350019002228	Grey	No	
034	1302_MW209_201103	Clear Plastic Bottle - Natural	500 mL	00070719075780	Green	No	
034	1302_MW209_201103	Amber DOC Filtered- Sulfuric Preserved	40 mL	00180220035977	Purple	No	
035	1302_QC300_201102	HDPE (no PTFE)	20 mL	00350019161099	Grey	No	
035	1302_QC300_201102	HDPE (no PTFE)	20 mL	00350019161161	Grey	No	
036	1302_QC400_201102	HDPE (no PTFE)	20 mL	00350019161211	Grey	No	
036	1302_QC400_201102	HDPE (no PTFE)	20 mL	00350019161232	Grey	No	
037	1302_QC500_201102	HDPE (no PTFE)	20 mL	00350019161142	Grey	No	
037	1302_QC500_201102	HDPE (no PTFE)	20 mL	00350019161175	Grey	No	
038	1302_QC301_201103	HDPE (no PTFE)	20 mL	00350019160990	Grey	No	
038	1302_QC301_201103	HDPE (no PTFE)	20 mL	00350019161208	Grey	No	
039	1302_QC401_201103	HDPE (no PTFE)	20 mL	00350019161098	Grey	No	
039	1302_QC401_201103	HDPE (no PTFE)	20 mL	00350019161241	Grey	No	
040	1302_QC501_201103	HDPE (no PTFE)	20 mL	00350019160979	Grey	No	
040	1302_QC501_201103	HDPE (no PTFE)	20 mL	00350019161030	Grey	No	
041	1302_MW176_201104	Clear Plastic Bottle - Natural	500 mL	00071119029339	Green	No	
041	1302_MW176_201104	HDPE (no PTFE)	20 mL	00350019160992	Grey	No	
041	1302_MW176_201104	HDPE (no PTFE)	20 mL	00350019161013	Grey	No	
041	1302_MW176_201104	Amber DOC Filtered- Sulfuric Preserved	40 mL	00181018035313	Purple	No	
042	1302_MW292_201104	Clear Plastic Bottle - Natural	500 mL	00071119029356	Green	No	

CHAIN OF CUSTODY

COC#: **15430** *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_NT_PFASOMP

SITE: 1302_NT_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: [redacted] 6/11/20	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: 5-2 °C

Other comments:

042	1302_MW292_201104	HDPE (no PTFE)	20 mL	00350019043911	Grey	No	
042	1302_MW292_201104	HDPE (no PTFE)	20 mL	00350019044003	Grey	No	
042	1302_MW292_201104	Amber DOC Filtered- Sulfuric Preserved	40 mL	00180220036189	Purple	No	
043	1302_QC302_201104	HDPE (no PTFE)	20 mL	00350019002420	Grey	No	
043	1302_QC302_201104	HDPE (no PTFE)	20 mL	00350019002378	Grey	No	
044	1302_QC402_201104	HDPE (no PTFE)	20 mL	00350019002505	Grey	No	
044	1302_QC402_201104	HDPE (no PTFE)	20 mL	00350019002362	Grey	No	
045	1302_QC502_201104	HDPE (no PTFE)	20 mL	00350019002384	Grey	No	
045	1302_QC502_201104	HDPE (no PTFE)	20 mL	00350019002433	Grey	No	

Total Bottle Count: ALS: 116, Non ALS: 0

AECOM 93 / 201222 / 1

Due 6/1/21 ms

8/1/21 SW

6/1/21 GS.

AECOM

1302 PAGE 2 of 2 Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
[redacted]

Laboratory Details
Lab. Name: ALS
Lab. Address: 277-289 Woodpark Rd, Smithfield
[redacted]
Lab. Ref:
Tel: [redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

Sampled By: [redacted]

AECOM Project #: 60612561 **Purchase Order No:**

Specifications: Please report in ESdat format

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	

6. Report Format: ESdat 7. Project Manager:

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Preservation: filted	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	PFAS Waters WATER	Surface Waters WATER	HOLD	Notes
15	1302_SW143_201217	17/12/2020 11:05	123	X			X			X	X	X	
16	1302_QC100_201216	16/12/2020 0:00		X			X			X		X	
-	1302_QC200_201216-FORWARD	16/12/2020 0:00		X			X		N20/031633	X		X	NMI SYDNEY
17	1302_QC300_201216	16/12/2020 0:00		X			X			X		X	
18	1302_QC400_201216	16/12/2020 0:00		X			X			X		X	
19	1302_QC500_201216	16/12/2020 0:00		X			X			X		X	
20	1302_QC101_201216	16/12/2020 0:00		X			X			X		X	
-	1302_QC201_201216-FORWARD	16/12/2020 0:00		X			X		N20/031634	X		X	NMI SYDNEY
21	1302_QC301_201217 - 2402	17/12/2020 0:00		X			X			X		X	
22	1302_QC401_201217 - 2402	17/12/2020 0:00		X			X			X		X	
23	1302_QC501_201217 - 502	17/12/2020 0:00		X			X			X		X	
24 MR	1302_SW181_201218	18/12/2020 15:25	1644	X			X			X	X	X	
25	1302_QC102_201218	18/12/2020 15:25		X			X			X		X	
- MR	1302_QC202_201218 FORWARD	18/12/2020 15:25	↓	X			X			X		X	- NMI SYDNEY

LABELLED BY LOCATION NAME ONLY ON SAMPLE BOTTLES. NO SITE OR DATE USED IN SAMPLE BOTTLE NAMING CONVENTION. IN LAB REPORTS PLEASE USE WHAT IS ON THE COC PLEASE INCORPORATE SAMPLING TIMES INTO THE REPORTS AND ESDAT FILES, IF PROVIDED

→ NOT RECVD. Am

Comments: Please send ESdat files to DERP.labreports@esdat.com.au and ensure that the files use the PROJECT NAME

Temp. received: °C

Report & Invoice: APCORP.ANZ@aecom.com

Lab Report No: Esky ID:

Relinquished by: [redacted]	Signed: [redacted]	Date: 21/12/20	Relinquished by:	Signed:	Date:
Received by:	Signed:	Date:	Received by:	Signed:	Date:

RECEIVED
22 DEC 2020
BY: [redacted]

AECOM 1302 PAGE 1 of 2 Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
[redacted]

Laboratory Details
Lab. Name: ALS
Lab. Address: 277-289 Woodpark Rd, Smithfield
[redacted]
Lab. Ref:
Tel: [redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

AECOM Project #: 60612561 **Purchase Order No:**

Specifications: Please report in ESdat format	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	

6. Report Format: ESdat 7. Project Manager:

Analysis Request: PFAS Waters WATER; Surface Waters WATER; HOLD

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	PFAS Waters WATER	Surface Waters WATER	HOLD	Notes
1	1302_SW112_201216	16/12/2020 9:50	1128	X			X			X		X	
2	1302_SW113_201216	16/12/2020 10:05	1134	X			X			X		X	
3	1302_SW125_201216	16/12/2020 10:27	1157	X			X			X		X	
4	1302_SW120_201216	16/12/2020 10:45	1215	X			X			X		X	LABELLED BY LOCATION NAME ONLY. NO SITE OR DATE USED IN SAMPLE BOTTLE NAMING CONVENTION. IN LAB REPORTS PLEASE USE WHAT IS ON THE COC. PLEASE INCORPORATE SAMPLING TIMES INTO THE REPORTS AND ESDAT FILES.
5	1302_SW124_201216	16/12/2020 11:00	1230	X			X			X	X	X	
6	1302_SW114_201216	16/12/2020 12:15	1345	X			X			X	X	X	
7	1302_SW104_201216	16/12/2020 14:00	1530	X			X			X		X	
8	1302_SW115_201216	16/12/2020 14:15	1545	X			X			X	X	X	
9	1302_SW106_201216	16/12/2020 14:30	1600	X			X			X		X	
10	1302_SW108_201216	16/12/2020 14:50	1620	X			X			X		X	
11	1302_SW109_201216	16/12/2020 15:55	1725	X			X			X		X	
12	1302_SW168_201216	16/12/2020 16:20	1750	X			X			X	X	X	
13	1302_SW132_201217	17/12/2020 10:20	1150	X			X			X		X	
14	1302_SW133_201217	17/12/2020 10:50	1220	X			X			X	X	X	

Comments: Please send ESdat files to DERP.labreports@esdat.com.au and ensure that the files use the PROJECT NAME

Temp. received: 17.6°C

Report & invoice: APCORP.ANZ@aecom.com

Relinquished by: [redacted] Signed: Date: 21/12/20

Received by: [redacted] Signed: 10:00 Date: 21/12/20

Relinquished by: Signed:

Received by: Signed:

Environmental Division
Sydney
Work Order Reference
ES2045380

Telephone : 61-2-8784 8555

LAB OF ORIGIN
DARWIN

Subcon / Forward Lab / Split WO
Lab / Analysis: NME
Organised By / Date: QC 20
Relinquished By / Date: QC 21
Connote / Courier: QC 21
WO No: ES2045380
Attach By PO / Internal Sheet:

sample not received by ALS

CHAIN OF CUSTODY

ALS COC#: 18085 ALS Laboratory: ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: NT_1302_PFASOMP

SITE: NT_1302_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 22/1/21 1405	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: 10.2 °C

Other comments: MEC043/210127 Due 03/02/21 Rev

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1302_SW162_210120		20/01/2021 03:11 PM	Water	ALS: 2 Non ALS: 0	No	X		
002	1302_SW150_210119		20/01/2021 03:12 PM	Water	ALS: 2 Non ALS: 0	No	X		
003	1302_SW188_210119		20/01/2021 03:13 PM	Water	ALS: 2 Non ALS: 0	No	X		
004	1302_SW170_210119		20/01/2021 03:13 PM	Water	ALS: 2 Non ALS: 0	No	X		
005	1302_SW181_210120		20/01/2021 03:15 PM	Water	ALS: 2 Non ALS: 0	No	X		
006	1302_SW178_210120		20/01/2021 03:16 PM	Water	ALS: 2 Non ALS: 0	No	X		
007	1302_QC100_210119		20/01/2021 03:16 PM	Water	ALS: 2 Non ALS: 0	No	X		
008	1302_QC200_210119	Please forward to nmi for analysis	20/01/2021 03:17 PM	Water	ALS: 2 Non ALS: 0	Yes	-	N21/001633	
009	1302_QC300_210119		20/01/2021 03:18 PM	Water	ALS: 2 Non ALS: 0	No	X		

LCMS #8 QC200

Environmental Division Sydney
Work Order Reference
ES2102255

Telephone : 61-2-8784 8555

RECEIVED
27 JAN 2021
BY: [redacted] 16:06

CHAIN OF CUSTODY

ALS COC#: 18085 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: NT_1302_PFASOMP

SITE: NT_1302_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: [redacted] 22/11/21 1405	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: 10-2< °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	1302_QC400_210119		20/01/2021 03:18 PM	Water	ALS: 2 Non ALS: 0	No	X		
011	1203_QC500_210119		20/01/2021 03:19 PM	Water	ALS: 2 Non ALS: 0	No	X		
012	1302_QC301_210120		20/01/2021 03:20 PM	Water	ALS: 2 Non ALS: 0	No	X		
013	1302_QC401_210120		20/01/2021 03:22 PM	Water	ALS: 2 Non ALS: 0	No	X		
014	1302_QC501_210120		19/01/2021 04:50 PM	Water	ALS: 2 Non ALS: 0	No	X		

RECEIVED
27 JAN 2021
BY: [redacted] 1600

CHAIN OF CUSTODY

COC#: 18085 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: NT_1302_PFASOMP

SITE: NT_1302_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 22/1/21 1405	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: 10-2 °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	1302_SW162_210120	HDPE (no PTFE)	20 mL	00350019161148	Grey	No	
001	1302_SW162_210120	HDPE (no PTFE)	20 mL	00350019161116	Grey	No	
002	1302_SW150_210119	HDPE (no PTFE)	20 mL	00350019043818	Grey	No	
002	1302_SW150_210119	HDPE (no PTFE)	20 mL	00350019043997	Grey	No	
003	1302_SW188_210119	HDPE (no PTFE)	20 mL	00350019043866	Grey	No	
003	1302_SW188_210119	HDPE (no PTFE)	20 mL	00350019043954	Grey	No	
004	1302_SW170_210119	HDPE (no PTFE)	20 mL	00350019179922	Grey	No	
004	1302_SW170_210119	HDPE (no PTFE)	20 mL	00350019180197	Grey	No	
005	1302_SW181_210120	HDPE (no PTFE)	20 mL	00350019179933	Grey	No	
005	1302_SW181_210120	HDPE (no PTFE)	20 mL	00350019180022	Grey	No	
006	1302_SW178_210120	HDPE (no PTFE)	20 mL	00350019125881	Grey	No	
006	1302_SW178_210120	HDPE (no PTFE)	20 mL	00350019126389	Grey	No	
007	1302_QC100_210119	HDPE (no PTFE)	20 mL	00350019180112	Grey	No	
007	1302_QC100_210119	HDPE (no PTFE)	20 mL	00350019180094	Grey	No	
008	1302_QC200_210119	HDPE (no PTFE)	20 mL	00350019044052	Grey	No	
008	1302_QC200_210119	HDPE (no PTFE)	20 mL	00350019043785	Grey	No	
009	1302_QC300_210119	HDPE (no PTFE)	20 mL	00350019145830	Grey	No	
009	1302_QC300_210119	HDPE (no PTFE)	20 mL	00350019145648	Grey	No	
010	1302_QC400_210119	HDPE (no PTFE)	20 mL	00350019126385	Grey	No	
010	1302_QC400_210119	HDPE (no PTFE)	20 mL	00350019125960	Grey	No	
011	1203_QC500_210119	HDPE (no PTFE)	20 mL	00350019180016	Grey	No	
011	1203_QC500_210119	HDPE (no PTFE)	20 mL	00350019180215	Grey	No	
012	1302_QC301_210120	HDPE (no PTFE)	20 mL	00350019043959	Grey	No	
012	1302_QC301_210120	HDPE (no PTFE)	20 mL	00350019043872	Grey	No	
013	1302_QC401_210120	HDPE (no PTFE)	20 mL	00350019180046	Grey	No	
013	1302_QC401_210120	HDPE (no PTFE)	20 mL	00350019180098	Grey	No	

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CHAIN OF CUSTODY

ALS COC#: 18085 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: NT_1302_PFASOMP

SITE: NT_1302_PFASOMP

ORDER NO: 60612561 4.1

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 22/1/21 1405	DATE TIME:	DATE TIME:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Se[redacted] (Yes) No N/A

Free ice / [redacted]resent upon receipt? Yes No N/A

Random Sample Temperature on Receipt: 18<2 °C

Other comments:

014	1302_QC501_210120	HDPE (no PTFE)	20 mL	00350019043977	Grey	No	
014	1302_QC501_210120	HDPE (no PTFE)	20 mL	00350019043835	Grey	No	

Total Bottle Count: ALS: 28, Non ALS: 0

RECEIVED
27 JAN 2021
BY: .....

Appendix E

Laboratory Certificates

Appendix E Laboratory Certificates

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	[redacted]
Amendment	
Client	
Contact	
Address	4
Telephone	
Project	
Order number	
C-O-C number	
Sampler	
Site	
Quote number	
No. of samples received	: 44
No. of samples analysed	: 43

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. 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*
[redacted]	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
	LCMS Coordinator	Sydney Organics, Smithfield, NSW
	Analyst	Sydney Inorganics, Smithfield, NSW
	Inorganics Coordinator	Sydney Inorganics, 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 Contact 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.
- EP231X: Surrogate recovery bias low due to sample matrix interferences.
- EN055: Ionic Balance out of acceptable limits for sample ES2039162-#006 and #034 due to analytes not quantified in this report.
- Amendment (18/11/2020): This report has been amended as a result of a request to change of project ID. All analysis results are as per the previous report.
- EP231X: Particular samples required dilution due to sample matrix . LOR values have been adjusted accordingly.
- 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)				Client sample ID	1302_MW194_201102	1302_MW195_201102	1302_QC100_201102	1302_MW193_201102	1302_MW185_201102
				Client sampling date / time	02-Nov-2020 10:16	02-Nov-2020 10:38	02-Nov-2020 10:40	02-Nov-2020 11:04	02-Nov-2020 11:41
Compound	CAS Number	LOR	Unit		ES2039162-001	ES2039162-002	ES2039162-003	ES2039162-005	ES2039162-006
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**156**	----	----	----	**7540**
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		**4**	----	----	----	**107**
Total Alkalinity as CaCO3	----	1	mg/L		**4**	----	----	----	**107**
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		<1	----	----	----	**33**
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		**3**	----	----	----	**162**
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		<1	----	----	----	**8**
Magnesium	7439-95-4	1	mg/L		<1	----	----	----	**12**
Sodium	7440-23-5	1	mg/L		**3**	----	----	----	**78**
Potassium	7440-09-7	1	mg/L		<1	----	----	----	**3**
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		<0.1	----	----	----	**0.4**
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		**0.16**	----	----	----	**7.39**
ø Total Cations	----	0.01	meq/L		**0.13**	----	----	----	**4.86**
ø Ionic Balance	----	0.01	%		**----**	----	----	----	**20.7**
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L		<1	----	----	----	**5**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.11**	<0.02	<0.02	**0.03**	**0.03**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.13**	<0.02	<0.02	**0.04**	**0.05**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**0.97**	**0.06**	**0.04**	**0.33**	**0.34**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.06**	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**2.22**	**0.24**	**0.14**	**0.62**	**0.26**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_MW194_201102	1302_MW195_201102	1302_QC100_201102	1302_MW193_201102	1302_MW185_201102
				Client sampling date / time	02-Nov-2020 10:16	02-Nov-2020 10:38	02-Nov-2020 10:40	02-Nov-2020 11:04	02-Nov-2020 11:41
Compound	CAS Number	LOR	Unit		ES2039162-001	ES2039162-002	ES2039162-003	ES2039162-005	ES2039162-006
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
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		**0.20**	<0.02	<0.02	**0.05**	**0.06**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.03**	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.06**	<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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_MW194_201102	1302_MW195_201102	1302_QC100_201102	1302_MW193_201102	1302_MW185_201102
				Client sampling date / time	02-Nov-2020 10:16	02-Nov-2020 10:38	02-Nov-2020 10:40	02-Nov-2020 11:04	02-Nov-2020 11:41
Compound	CAS Number	LOR	Unit		ES2039162-001	ES2039162-002	ES2039162-003	ES2039162-005	ES2039162-006
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**3.78**	**0.30**	**0.18**	**1.08**	**0.76**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**3.19**	**0.30**	**0.18**	**0.95**	**0.60**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**3.59**	**0.30**	**0.18**	**1.04**	**0.71**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.5**	**94.7**	**101**	**98.3**	**98.7**
13C8-PFOA	----	0.02	%		**98.9**	**96.3**	**102**	**101**	**104**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_MW210_201102	1302_MW200_201102	1302_MW180_201102	1302_MW422_201102	1302_MW107_201102
				Client sampling date / time	02-Nov-2020 12:39	02-Nov-2020 13:13	02-Nov-2020 13:35	02-Nov-2020 15:13	02-Nov-2020 16:38
Compound	CAS Number	LOR	Unit		ES2039162-007	ES2039162-008	ES2039162-009	ES2039162-010	ES2039162-011
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.16**	**0.06**	<0.02	**3.35**	**0.32**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.13**	**0.08**	<0.02	**4.79**	**0.57**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**1.08**	**0.60**	**0.05**	**23.2**	**3.93**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.09**	**0.03**	<0.02	**2.16**	**0.30**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**2.91**	**0.97**	<0.01	**51.1**	**6.95**
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	**0.9**	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	**1.38**	**0.12**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.15**	**0.08**	<0.02	**7.16**	**0.71**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.03**	<0.02	<0.02	**0.83**	**0.13**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.05**	**0.02**	<0.01	**1.31**	**0.24**
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: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_MW210_201102	1302_MW200_201102	1302_MW180_201102	1302_MW422_201102	1302_MW107_201102
				Client sampling date / time	02-Nov-2020 12:39	02-Nov-2020 13:13	02-Nov-2020 13:35	02-Nov-2020 15:13	02-Nov-2020 16:38
Compound	CAS Number	LOR	Unit		ES2039162-007	ES2039162-008	ES2039162-009	ES2039162-010	ES2039162-011
					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		**4.60**	**1.84**	**0.05**	**96.2**	**13.3**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**3.99**	**1.57**	**0.05**	**74.3**	**10.9**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**4.38**	**1.73**	**0.05**	**89.2**	**12.4**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**99.6**	**102**	**98.5**	**94.5**
13C8-PFOA	----	0.02	%		**101**	**103**	**108**	**97.1**	**100**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_QC101_201102	1302_MW103_201102	1302_MW141_201102	1302_MW211_201103	1302_MW144_201103
				Client sampling date / time	02-Nov-2020 16:39	02-Nov-2020 16:53	02-Nov-2020 17:26	03-Nov-2020 08:35	03-Nov-2020 09:08
Compound	CAS Number	LOR	Unit		ES2039162-012	ES2039162-014	ES2039162-015	ES2039162-016	ES2039162-017
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		----	440	----	177	----
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		----	54	----	5	----
Total Alkalinity as CaCO3	----	1	mg/L		----	54	----	5	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	3	----	<1	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	6	----	7	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	8	----	<1	----
Magnesium	7439-95-4	1	mg/L		----	4	----	<1	----
Sodium	7440-23-5	1	mg/L		----	6	----	5	----
Potassium	7440-09-7	1	mg/L		----	<1	----	<1	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		----	<0.1	----	<0.1	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		----	1.31	----	0.30	----
ø Total Cations	----	0.01	meq/L		----	0.99	----	0.22	----
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L		----	2	----	<1	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.34	0.57	<0.02	<0.02	0.21
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.61	1.16	<0.02	<0.02	0.25
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		4.28	11.4	0.19	0.16	2.00
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.29	0.88	<0.02	<0.02	0.13
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		6.65	30.6	0.26	0.27	4.87

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_QC101_201102	1302_MW103_201102	1302_MW141_201102	1302_MW211_201103	1302_MW144_201103
				Client sampling date / time	02-Nov-2020 16:39	02-Nov-2020 16:53	02-Nov-2020 17:26	03-Nov-2020 08:35	03-Nov-2020 09:08
Compound	CAS Number	LOR	Unit		ES2039162-012	ES2039162-014	ES2039162-015	ES2039162-016	ES2039162-017
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	**0.10**	<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		**0.12**	**0.19**	<0.02	<0.02	**0.07**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.74**	**1.92**	<0.02	<0.02	**0.36**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.14**	**0.28**	<0.02	<0.02	**0.04**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.23**	**0.79**	<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	**0.11**	<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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_QC101_201102	1302_MW103_201102	1302_MW141_201102	1302_MW211_201103	1302_MW144_201103
				Client sampling date / time	02-Nov-2020 16:39	02-Nov-2020 16:53	02-Nov-2020 17:26	03-Nov-2020 08:35	03-Nov-2020 09:08
Compound	CAS Number	LOR	Unit		ES2039162-012	ES2039162-014	ES2039162-015	ES2039162-016	ES2039162-017
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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		**13.4**	**48.0**	**0.45**	**0.43**	**8.03**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**10.9**	**42.0**	**0.45**	**0.43**	**6.87**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**12.5**	**45.8**	**0.45**	**0.43**	**7.65**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**98.3**	**120**	**115**	**119**
13C8-PFOA	----	0.02	%		**103**	**103**	**113**	**114**	**112**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_MW205_201103	1302_MW112_201103	1302_QC102_201103	1302_MW156_201103	1302_MW115_201103
				Client sampling date / time	03-Nov-2020 09:50	03-Nov-2020 10:17	03-Nov-2020 10:18	03-Nov-2020 10:34	03-Nov-2020 10:54
Compound	CAS Number	LOR	Unit		ES2039162-018	ES2039162-019	ES2039162-020	ES2039162-022	ES2039162-023
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.05**	**0.46**	**0.48**	<0.02	**5.58**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.06**	**0.56**	**0.52**	<0.02	**6.10**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**0.60**	**4.24**	**3.89**	**0.12**	**40.1**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.03**	**0.36**	**0.34**	<0.02	**4.82**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.07**	**16.1**	**16.0**	**0.35**	**269**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	**0.02**	**0.03**	<0.02	**0.38**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**0.1**	**0.1**	<0.1	**1.2**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.19**	**0.18**	<0.02	**2.15**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.05**	**1.05**	**1.05**	**0.02**	**10.4**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.13**	**0.13**	<0.02	**1.18**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.02**	**0.31**	**0.30**	<0.01	**3.15**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.04**
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	**0.19**
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: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_MW205_201103	1302_MW112_201103	1302_QC102_201103	1302_MW156_201103	1302_MW115_201103
				Client sampling date / time	03-Nov-2020 09:50	03-Nov-2020 10:17	03-Nov-2020 10:18	03-Nov-2020 10:34	03-Nov-2020 10:54
Compound	CAS Number	LOR	Unit		ES2039162-018	ES2039162-019	ES2039162-020	ES2039162-022	ES2039162-023
					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		**1.88**	**23.5**	**23.0**	**0.49**	**344**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.67**	**20.3**	**19.9**	**0.47**	**309**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.79**	**22.6**	**22.1**	**0.49**	**333**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**119**	**112**	**113**	**117**	**108**
13C8-PFOA	----	0.02	%		**115**	**119**	**116**	**116**	**118**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_MW240_201103	1302_MW241_201103	1302_MW197_201103	1302_MW215_201103	1302_MW128_201103
				Client sampling date / time	03-Nov-2020 12:01	03-Nov-2020 12:02	03-Nov-2020 13:10	03-Nov-2020 13:11	03-Nov-2020 14:26
Compound	CAS Number	LOR	Unit		ES2039162-024	ES2039162-025	ES2039162-026	ES2039162-027	ES2039162-028
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**2.01**	**0.55**	**0.22**	**0.24**	**0.30**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**1.88**	**0.72**	**0.40**	**0.28**	**0.39**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**12.7**	**6.30**	**4.93**	**2.62**	**3.55**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**1.65**	**0.62**	**0.47**	**0.19**	**0.24**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**88.9**	**15.7**	**18.3**	**5.20**	**8.49**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		**0.28**	<0.02	**0.02**	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**2.5**	**1.1**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**4.21**	**1.99**	**0.17**	**0.16**	**0.16**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**10.4**	**2.81**	**0.81**	**0.47**	**0.71**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**5.48**	**2.28**	**0.10**	**0.09**	**0.10**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**8.40**	**2.63**	**0.30**	**0.13**	**0.21**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**1.61**	**0.62**	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		**0.19**	**0.04**	<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		**0.04**	<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: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_MW240_201103	1302_MW241_201103	1302_MW197_201103	1302_MW215_201103	1302_MW128_201103
				Client sampling date / time	03-Nov-2020 12:01	03-Nov-2020 12:02	03-Nov-2020 13:10	03-Nov-2020 13:11	03-Nov-2020 14:26
Compound	CAS Number	LOR	Unit		ES2039162-024	ES2039162-025	ES2039162-026	ES2039162-027	ES2039162-028
					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		**0.83**	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		**3.21**	**0.11**	<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		**144**	**35.5**	**25.7**	**9.38**	**14.2**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**102**	**22.0**	**23.2**	**7.82**	**12.0**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**139**	**33.5**	**24.8**	**8.91**	**13.5**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**114**	**120**	**117**	**114**	**112**
13C8-PFOA	----	0.02	%		**112**	**113**	**120**	**108**	**117**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_MW148_201103	1302_MW303_201103	1302_QC103_201103	1302_MW191_201103	1302_MW209_201103
				Client sampling date / time	03-Nov-2020 15:00	03-Nov-2020 15:53	03-Nov-2020 16:07	03-Nov-2020 16:29	03-Nov-2020 16:54
Compound	CAS Number	LOR	Unit		ES2039162-029	ES2039162-030	ES2039162-031	ES2039162-033	ES2039162-034
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		562	2350	348	909	18900
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		2	11	28	7	21
Total Alkalinity as CaCO3	----	1	mg/L		2	11	28	7	21
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		<1	<1	<1	<1	48
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		11	7	7	5	273
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		<1	<1	<1	<1	19
Magnesium	7439-95-4	1	mg/L		<1	2	2	<1	16
Sodium	7440-23-5	1	mg/L		3	4	4	5	125
Potassium	7440-09-7	1	mg/L		<1	<1	<1	<1	7
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		<0.1	<0.1	0.1	<0.1	<0.1
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		0.35	0.42	0.76	0.28	9.12
ø Total Cations	----	0.01	meq/L		0.13	0.34	0.34	0.22	7.88
ø Ionic Balance	----	0.01	%		----	----	----	----	7.29
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L		<1	5	8	5	<1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		0.22	5.84	5.89	<0.02	0.06
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		0.34	7.24	6.99	<0.02	0.08
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		3.00	46.1	44.0	<0.02	0.75
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		0.23	3.48	3.38	<0.02	0.03
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		6.62	84.8	77.0	<0.01	1.59

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_MW148_201103	1302_MW303_201103	1302_QC103_201103	1302_MW191_201103	1302_MW209_201103
				Client sampling date / time	03-Nov-2020 15:00	03-Nov-2020 15:53	03-Nov-2020 16:07	03-Nov-2020 16:29	03-Nov-2020 16:54
Compound	CAS Number	LOR	Unit		ES2039162-029	ES2039162-030	ES2039162-031	ES2039162-033	ES2039162-034
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
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	**1.0**	**1.2**	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.06**	**1.86**	**1.88**	<0.02	**0.03**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.34**	**12.2**	**11.8**	<0.02	**0.13**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.06**	**1.52**	**1.55**	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.13**	**3.12**	**3.39**	<0.01	**0.03**
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	**0.05**	**0.04**	<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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_MW148_201103	1302_MW303_201103	1302_QC103_201103	1302_MW191_201103	1302_MW209_201103
				Client sampling date / time	03-Nov-2020 15:00	03-Nov-2020 15:53	03-Nov-2020 16:07	03-Nov-2020 16:29	03-Nov-2020 16:54
Compound	CAS Number	LOR	Unit		ES2039162-029	ES2039162-030	ES2039162-031	ES2039162-033	ES2039162-034
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.11**	**0.11**	<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		**11.0**	**167**	**157**	<0.01	**2.70**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**9.62**	**131**	**121**	<0.01	**2.34**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**10.4**	**156**	**147**	<0.01	**2.59**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**113**	**107**	**110**	**115**
13C8-PFOA	----	0.02	%		**115**	**111**	**120**	**115**	**112**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_QC300_201102	1302_QC400_201102	1302_QC500_201102	1302_QC301_201103	1302_QC401_201103
				Client sampling date / time	03-Nov-2020 17:50	03-Nov-2020 17:50	03-Nov-2020 17:51	03-Nov-2020 18:03	03-Nov-2020 18:04
Compound	CAS Number	LOR	Unit		ES2039162-035	ES2039162-036	ES2039162-037	ES2039162-038	ES2039162-039
					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	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
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: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_QC300_201102	1302_QC400_201102	1302_QC500_201102	1302_QC301_201103	1302_QC401_201103
				Client sampling date / time	03-Nov-2020 17:50	03-Nov-2020 17:50	03-Nov-2020 17:51	03-Nov-2020 18:03	03-Nov-2020 18:04
Compound	CAS Number	LOR	Unit		ES2039162-035	ES2039162-036	ES2039162-037	ES2039162-038	ES2039162-039
					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	%		**110**	**99.9**	**101**	**95.8**	**104**
13C8-PFOA	----	0.02	%		**114**	**102**	**101**	**100**	**101**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_QC501_201103	1302_MW176_201104	1302_MW292_201104	1302_QC302_201104	1302_QC402_201104
				Client sampling date / time	03-Nov-2020 18:04	04-Nov-2020 17:21	04-Nov-2020 17:52	04-Nov-2020 18:07	04-Nov-2020 18:08
Compound	CAS Number	LOR	Unit		ES2039162-040	ES2039162-041	ES2039162-042	ES2039162-043	ES2039162-044
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		----	803	187	----	----
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		----	6	43	----	----
Total Alkalinity as CaCO3	----	1	mg/L		----	6	43	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	<1	<1	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	8	3	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	2	1	----	----
Magnesium	7439-95-4	1	mg/L		----	<1	1	----	----
Sodium	7440-23-5	1	mg/L		----	4	3	----	----
Potassium	7440-09-7	1	mg/L		----	<1	<1	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		----	<0.1	<0.1	----	----
EN055: Ionic Balance									
ø Total Anions	----	0.01	meq/L		----	0.34	0.94	----	----
ø Total Cations	----	0.01	meq/L		----	0.27	0.26	----	----
EP002: Dissolved Organic Carbon (DOC)									
Dissolved Organic Carbon	----	1	mg/L		----	1	45	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	0.84	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	1.12	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		<0.02	0.05	9.87	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	1.09	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	0.08	49.0	<0.01	<0.01

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_QC501_201103	1302_MW176_201104	1302_MW292_201104	1302_QC302_201104	1302_QC402_201104
				Client sampling date / time	03-Nov-2020 18:04	04-Nov-2020 17:21	04-Nov-2020 17:52	04-Nov-2020 18:07	04-Nov-2020 18:08
Compound	CAS Number	LOR	Unit		ES2039162-040	ES2039162-041	ES2039162-042	ES2039162-043	ES2039162-044
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	**0.10**	<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	**0.35**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**3.50**	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.33**	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.87**	<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	**0.05**	<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									

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_QC501_201103	1302_MW176_201104	1302_MW292_201104	1302_QC302_201104	1302_QC402_201104
				Client sampling date / time	03-Nov-2020 18:04	04-Nov-2020 17:21	04-Nov-2020 17:52	04-Nov-2020 18:07	04-Nov-2020 18:08
Compound	CAS Number	LOR	Unit		ES2039162-040	ES2039162-041	ES2039162-042	ES2039162-043	ES2039162-044
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	**0.26**	<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	**0.13**	**67.4**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.13**	**58.9**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.13**	**65.0**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.0**	**99.8**	**102**	**99.2**	**93.6**
13C8-PFOA	----	0.02	%		**100**	**104**	**104**	**99.3**	**104**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_QC502_201104	1302_MW139_201104	1302_MW297_201104	----	----
				Client sampling date / time	04-Nov-2020 18:35	02-Nov-2020 00:00	02-Nov-2020 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2039162-045	ES2039162-046	ES2039162-047	--------	--------
					Result	Result	Result	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.06**	**0.48**	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.07**	**0.68**	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		<0.02	**0.62**	**5.03**	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.04**	**0.50**	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**1.55**	**25.6**	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	**0.06**	----	----
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	**0.14**	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.10**	**1.16**	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.20**	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.03**	**0.49**	----	----
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	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Client sample ID	1302_QC502_201104	1302_MW139_201104	1302_MW297_201104	----	----
				Client sampling date / time	04-Nov-2020 18:35	02-Nov-2020 00:00	02-Nov-2020 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2039162-045	ES2039162-046	ES2039162-047	--------	--------
					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	----	----
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	----	----
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	**2.47**	**34.4**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**2.17**	**30.6**	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**2.36**	**33.2**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.4**	**101**	**111**	----	----
13C8-PFOA	----	0.02	%		**100**	**98.0**	**103**	----	----

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	[redacted]
Amendment	
Client	
Contact	
Address	
Telephone	
Project	
Order number	
C-O-C number	
Sampler	
Site	
Quote number	
No. of samples received	
No. of samples analysed	

NATA
editation No. 825
ompliance with
17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. 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*
[redacted]	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
	LCMS Coordinator	Sydney Organics, Smithfield, NSW
	Analyst	Sydney Inorganics, Smithfield, NSW
	Inorganics Coordinator	Sydney Inorganics, 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

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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 3353867)									
ES2038624-001	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.00	No Limit
ES2039161-006	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	<5	0.00	No Limit
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 3356162)									
ES2038827-020	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	<5	8	46.2	No Limit
ES2039162-016	1302_MW211_201103	EA025H: Suspended Solids (SS)	----	5	mg/L	177	174	1.42	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 3358818)									
ES2039162-041	1302_MW176_201104	EA025H: Suspended Solids (SS)	----	5	mg/L	803	762	5.21	0% - 20%
ES2039268-002	Anonymous	EA025H: Suspended Solids (SS)	----	5	mg/L	223	257	14.1	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 3353189)									
ES2039161-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	66	66	0.00	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	66	66	0.00	0% - 20%
ES2039162-014	1302_MW103_201102	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	54	53	3.48	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	54	53	3.48	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 3353191)									
ES2039179-016	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	141	140	0.00	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	141	140	0.00	0% - 20%
ES2039200-002	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED037P: Alkalinity by PC Titrator (QC Lot: 3353191) - continued									
ES2039200-002	Anonymous	ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	137	140	2.52	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	137	140	2.52	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3351155)									
ES2039161-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.00	No Limit
ES2039162-034	1302_MW209_201103	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	48	49	0.00	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 3351156)									
ES2039162-034	1302_MW209_201103	ED045G: Chloride	16887-00-6	1	mg/L	273	271	0.729	0% - 20%
ES2039250-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	25	25	0.00	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 3356045)									
ES2039161-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	<1	<1	0.00	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.00	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	3	3	0.00	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.00	No Limit
ES2039162-014	1302_MW103_201102	ED093F: Calcium	7440-70-2	1	mg/L	8	8	0.00	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	4	5	0.00	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	6	5	0.00	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.00	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 3353190)									
ES2039161-002	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.00	No Limit
ES2039162-014	1302_MW103_201102	EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	<0.1	0.00	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 3359474)									
ES2039161-001	Anonymous	EP002: Dissolved Organic Carbon	----	1	mg/L	1	3	74.2	No Limit
ES2039162-014	1302_MW103_201102	EP002: Dissolved Organic Carbon	----	1	mg/L	2	4	65.7	No Limit

Method Blank (MB) and Laboratory Control Spike (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 Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 3353867)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	101	83.0	129
				<5	1000 mg/L	96.4	82.0	110
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 3356162)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	98.7	83.0	129
				<5	1000 mg/L	93.7	82.0	110
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 3358818)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	96.7	83.0	129
				<5	1000 mg/L	99.6	82.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 3353189)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	104	81.0	111
				----	50 mg/L	123	70.0	130
ED037P: Alkalinity by PC Titrator (QCLot: 3353191)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	95.2	81.0	111
				----	50 mg/L	114	70.0	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3351155)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	110	82.0	122
				<1	500 mg/L	98.7	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 3351156)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	103	80.9	127
				<1	1000 mg/L	102	80.9	127
ED093F: Dissolved Major Cations (QCLot: 3356045)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	100	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	99.4	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	101	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	103	85.0	113
EK040P: Fluoride by PC Titrator (QCLot: 3353190)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	99.4	82.0	116
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3359474)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	10 mg/L	105	71.0	121
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3353181)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	87.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	95.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	96.0	68.0	131

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3353181) - continued								
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	95.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	85.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3353225)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	100	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	0.02	µg/L	<0.02	0.25 µg/L	108	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	119	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	113	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3353540)								
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	85.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	91.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	82.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	80.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	87.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3353181)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	97.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	107	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	108	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	110	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3353225)								
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	111	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	119	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	110	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	112	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	114	69.0	133

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3353225) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	118	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	101	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3353540)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	90.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	80.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	86.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	80.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	85.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	88.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	74.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	75.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	75.1	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3353181)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	97.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	106	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	116	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	81.3	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	89.8	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	108	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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3353225)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	96.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	110	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	117	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	114	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	80.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	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

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3353540)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	75.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	87.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	86.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	77.9	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	73.7	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	82.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3353181)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	80.0	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	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	103	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	107	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3353225)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	106	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	112	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	109	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3353540)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	88.0	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	94.6	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	78.0	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	82.0	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	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
				Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3351155)							
ES2039161-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	101	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 3351156)							
ES2039250-002	Anonymous	ED045G: Chloride	16887-00-6	50 mg/L	83.4	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EK040P: Fluoride by PC Titrator (QCLot: 3353190)							
ES2039161-006	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	94.8	70.0	130
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3359474)							
ES2039161-002	Anonymous	EP002: Dissolved Organic Carbon	----	100 mg/L	119	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	[redacted]
Amendment	
Client	
Contact	
Project	
Site	
Sampler	
Order number	

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

- **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 : 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						
1302_MW194_201102, 1302_MW185_201102, 1302_MW103_201102	----	----	----	10-Nov-2020	09-Nov-2020	**1**

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	0	51	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	51	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
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
1302_MW194_201102, 1302_MW185_201102, 1302_MW103_201102	**02-Nov-2020**	**----**	----	----	**09-Nov-2020**	09-Nov-2020	✓
Clear Plastic Bottle - Natural (EA025H)							
1302_MW211_201103, 1302_MW148_201103, 1302_MW303_201103, 1302_QC103_201103, 1302_MW191_201103, 1302_MW209_201103	**03-Nov-2020**	**----**	----	----	**10-Nov-2020**	10-Nov-2020	✓
Clear Plastic Bottle - Natural (EA025H)							
1302_MW176_201104, 1302_MW292_201104	**04-Nov-2020**	**----**	----	----	**11-Nov-2020**	11-Nov-2020	✓

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)								
1302_MW194_201102, 1302_MW103_201102	1302_MW185_201102,	**02-Nov-2020**	**----**	----	----	**09-Nov-2020**	16-Nov-2020	✓
Clear Plastic Bottle - Natural (ED037-P)								
1302_MW211_201103, 1302_MW303_201103, 1302_MW191_201103,	1302_MW148_201103, 1302_QC103_201103, 1302_MW209_201103	**03-Nov-2020**	**----**	----	----	**09-Nov-2020**	17-Nov-2020	✓
Clear Plastic Bottle - Natural (ED037-P)								
1302_MW176_201104,	1302_MW292_201104	**04-Nov-2020**	**----**	----	----	**09-Nov-2020**	18-Nov-2020	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G)								
1302_MW194_201102, 1302_MW103_201102	1302_MW185_201102,	**02-Nov-2020**	**----**	----	----	**07-Nov-2020**	30-Nov-2020	✓
Clear Plastic Bottle - Natural (ED041G)								
1302_MW211_201103, 1302_MW303_201103, 1302_MW191_201103,	1302_MW148_201103, 1302_QC103_201103, 1302_MW209_201103	**03-Nov-2020**	**----**	----	----	**07-Nov-2020**	01-Dec-2020	✓
Clear Plastic Bottle - Natural (ED041G)								
1302_MW176_201104,	1302_MW292_201104	**04-Nov-2020**	**----**	----	----	**07-Nov-2020**	02-Dec-2020	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
1302_MW194_201102, 1302_MW103_201102	1302_MW185_201102,	**02-Nov-2020**	**----**	----	----	**07-Nov-2020**	30-Nov-2020	✓
Clear Plastic Bottle - Natural (ED045G)								
1302_MW211_201103, 1302_MW303_201103, 1302_MW191_201103,	1302_MW148_201103, 1302_QC103_201103, 1302_MW209_201103	**03-Nov-2020**	**----**	----	----	**07-Nov-2020**	01-Dec-2020	✓
Clear Plastic Bottle - Natural (ED045G)								
1302_MW176_201104,	1302_MW292_201104	**04-Nov-2020**	**----**	----	----	**07-Nov-2020**	02-Dec-2020	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F)								
1302_MW194_201102, 1302_MW103_201102	1302_MW185_201102,	**02-Nov-2020**	**----**	----	----	**10-Nov-2020**	09-Nov-2020	×
Clear Plastic Bottle - Natural (ED093F)								
1302_MW211_201103, 1302_MW303_201103, 1302_MW191_201103,	1302_MW148_201103, 1302_QC103_201103, 1302_MW209_201103	**03-Nov-2020**	**----**	----	----	**10-Nov-2020**	10-Nov-2020	✓
Clear Plastic Bottle - Natural (ED093F)								
1302_MW176_201104,	1302_MW292_201104	**04-Nov-2020**	**----**	----	----	**10-Nov-2020**	11-Nov-2020	✓

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
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
1302_MW194_201102, 1302_MW185_201102, 1302_MW103_201102	**02-Nov-2020**	**----**	----	----	**09-Nov-2020**	30-Nov-2020	✓
Clear Plastic Bottle - Natural (EK040P)							
1302_MW211_201103, 1302_MW148_201103, 1302_MW303_201103, 1302_QC103_201103, 1302_MW191_201103, 1302_MW209_201103	**03-Nov-2020**	**----**	----	----	**09-Nov-2020**	01-Dec-2020	✓
Clear Plastic Bottle - Natural (EK040P)							
1302_MW176_201104, 1302_MW292_201104	**04-Nov-2020**	**----**	----	----	**09-Nov-2020**	02-Dec-2020	✓
EP002: Dissolved Organic Carbon (DOC)							
Amber DOC Filtered- Sulfuric Preserved (EP002)							
1302_MW194_201102, 1302_MW185_201102, 1302_MW103_201102	**02-Nov-2020**	**----**	----	----	**12-Nov-2020**	30-Nov-2020	✓
Amber DOC Filtered- Sulfuric Preserved (EP002)							
1302_MW211_201103, 1302_MW148_201103, 1302_MW303_201103, 1302_QC103_201103, 1302_MW191_201103, 1302_MW209_201103	**03-Nov-2020**	**----**	----	----	**12-Nov-2020**	01-Dec-2020	✓
Amber DOC Filtered- Sulfuric Preserved (EP002)							
1302_MW176_201104, 1302_MW292_201104	**04-Nov-2020**	**----**	----	----	**12-Nov-2020**	02-Dec-2020	✓

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)							
1302_MW194_201102, 1302_MW195_201102, 1302_QC100_201102, 1302_MW193_201102, 1302_MW185_201102, 1302_MW210_201102, 1302_MW200_201102, 1302_MW180_201102, 1302_MW422_201102, 1302_MW107_201102, 1302_QC101_201102, 1302_MW103_201102	**02-Nov-2020**	**10-Nov-2020**	01-May-2021	✓	**11-Nov-2020**	01-May-2021	✓
HDPE (no PTFE) (EP231X)							
1302_MW141_201102, 1302_MW139_201104, 1302_MW297_201104	**02-Nov-2020**	**11-Nov-2020**	01-May-2021	✓	**11-Nov-2020**	01-May-2021	✓
HDPE (no PTFE) (EP231X)							
1302_MW211_201103, 1302_MW144_201103, 1302_MW205_201103, 1302_MW112_201103, 1302_QC102_201103, 1302_MW156_201103, 1302_MW115_201103, 1302_MW240_201103, 1302_MW241_201103, 1302_MW197_201103, 1302_MW215_201103, 1302_MW128_201103, 1302_MW148_201103, 1302_MW303_201103, 1302_QC103_201103, 1302_MW191_201103, 1302_MW209_201103, 1302_QC300_201102, 1302_QC400_201102, 1302_QC500_201102, 1302_QC301_201103, 1302_QC401_201103, 1302_QC501_201103	**03-Nov-2020**	**11-Nov-2020**	02-May-2021	✓	**11-Nov-2020**	02-May-2021	✓
HDPE (no PTFE) (EP231X)							
1302_MW176_201104, 1302_MW292_201104, 1302_QC302_201104, 1302_QC402_201104, 1302_QC502_201104	**04-Nov-2020**	**11-Nov-2020**	03-May-2021	✓	**11-Nov-2020**	03-May-2021	✓

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) 1302_MW194_201102, 1302_MW195_201102, 1302_QC100_201102, 1302_MW193_201102, 1302_MW185_201102, 1302_MW210_201102, 1302_MW200_201102, 1302_MW180_201102, 1302_MW422_201102, 1302_MW107_201102, 1302_QC101_201102, 1302_MW103_201102	**02-Nov-2020**	**10-Nov-2020**	01-May-2021	✓	**11-Nov-2020**	01-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_MW141_201102, 1302_MW139_201104, 1302_MW297_201104	**02-Nov-2020**	**11-Nov-2020**	01-May-2021	✓	**11-Nov-2020**	01-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_MW211_201103, 1302_MW144_201103, 1302_MW205_201103, 1302_MW112_201103, 1302_QC102_201103, 1302_MW156_201103, 1302_MW115_201103, 1302_MW240_201103, 1302_MW241_201103, 1302_MW197_201103, 1302_MW215_201103, 1302_MW128_201103, 1302_MW148_201103, 1302_MW303_201103, 1302_QC103_201103, 1302_MW191_201103, 1302_MW209_201103, 1302_QC300_201102, 1302_QC400_201102, 1302_QC500_201102, 1302_QC301_201103, 1302_QC401_201103, 1302_QC501_201103	**03-Nov-2020**	**11-Nov-2020**	02-May-2021	✓	**11-Nov-2020**	02-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_MW176_201104, 1302_MW292_201104, 1302_QC302_201104, 1302_QC402_201104, 1302_QC502_201104	**04-Nov-2020**	**11-Nov-2020**	03-May-2021	✓	**11-Nov-2020**	03-May-2021	✓

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) 1302_MW194_201102, 1302_MW195_201102, 1302_QC100_201102, 1302_MW193_201102, 1302_MW185_201102, 1302_MW210_201102, 1302_MW200_201102, 1302_MW180_201102, 1302_MW422_201102, 1302_MW107_201102, 1302_QC101_201102, 1302_MW103_201102	**02-Nov-2020**	**10-Nov-2020**	01-May-2021	✓	**11-Nov-2020**	01-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_MW141_201102, 1302_MW139_201104, 1302_MW297_201104	**02-Nov-2020**	**11-Nov-2020**	01-May-2021	✓	**11-Nov-2020**	01-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_MW211_201103, 1302_MW144_201103, 1302_MW205_201103, 1302_MW112_201103, 1302_QC102_201103, 1302_MW156_201103, 1302_MW115_201103, 1302_MW240_201103, 1302_MW241_201103, 1302_MW197_201103, 1302_MW215_201103, 1302_MW128_201103, 1302_MW148_201103, 1302_MW303_201103, 1302_QC103_201103, 1302_MW191_201103, 1302_MW209_201103, 1302_QC300_201102, 1302_QC400_201102, 1302_QC500_201102, 1302_QC301_201103, 1302_QC401_201103, 1302_QC501_201103	**03-Nov-2020**	**11-Nov-2020**	02-May-2021	✓	**11-Nov-2020**	02-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_MW176_201104, 1302_MW292_201104, 1302_QC302_201104, 1302_QC402_201104, 1302_QC502_201104	**04-Nov-2020**	**11-Nov-2020**	03-May-2021	✓	**11-Nov-2020**	03-May-2021	✓

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) 1302_MW194_201102, 1302_MW195_201102, 1302_QC100_201102, 1302_MW193_201102, 1302_MW185_201102, 1302_MW210_201102, 1302_MW200_201102, 1302_MW180_201102, 1302_MW422_201102, 1302_MW107_201102, 1302_QC101_201102, 1302_MW103_201102	**02-Nov-2020**	**10-Nov-2020**	01-May-2021	✓	**11-Nov-2020**	01-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_MW141_201102, 1302_MW139_201104, 1302_MW297_201104	**02-Nov-2020**	**11-Nov-2020**	01-May-2021	✓	**11-Nov-2020**	01-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_MW211_201103, 1302_MW144_201103, 1302_MW205_201103, 1302_MW112_201103, 1302_QC102_201103, 1302_MW156_201103, 1302_MW115_201103, 1302_MW240_201103, 1302_MW241_201103, 1302_MW197_201103, 1302_MW215_201103, 1302_MW128_201103, 1302_MW148_201103, 1302_MW303_201103, 1302_QC103_201103, 1302_MW191_201103, 1302_MW209_201103, 1302_QC300_201102, 1302_QC400_201102, 1302_QC500_201102, 1302_QC301_201103, 1302_QC401_201103, 1302_QC501_201103	**03-Nov-2020**	**11-Nov-2020**	02-May-2021	✓	**11-Nov-2020**	02-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_MW176_201104, 1302_MW292_201104, 1302_QC302_201104, 1302_QC402_201104, 1302_QC502_201104	**04-Nov-2020**	**11-Nov-2020**	03-May-2021	✓	**11-Nov-2020**	03-May-2021	✓

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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_MW194_201102, 1302_MW195_201102, 1302_QC100_201102, 1302_MW193_201102, 1302_MW185_201102, 1302_MW210_201102, 1302_MW200_201102, 1302_MW180_201102, 1302_MW422_201102, 1302_MW107_201102, 1302_QC101_201102, 1302_MW103_201102	**02-Nov-2020**	**10-Nov-2020**	01-May-2021	✓	**11-Nov-2020**	01-May-2021	✓
HDPE (no PTFE) (EP231X)							
1302_MW141_201102, 1302_MW139_201104, 1302_MW297_201104	**02-Nov-2020**	**11-Nov-2020**	01-May-2021	✓	**11-Nov-2020**	01-May-2021	✓
HDPE (no PTFE) (EP231X)							
1302_MW211_201103, 1302_MW144_201103, 1302_MW205_201103, 1302_MW112_201103, 1302_QC102_201103, 1302_MW156_201103, 1302_MW115_201103, 1302_MW240_201103, 1302_MW241_201103, 1302_MW197_201103, 1302_MW215_201103, 1302_MW128_201103, 1302_MW148_201103, 1302_MW303_201103, 1302_QC103_201103, 1302_MW191_201103, 1302_MW209_201103, 1302_QC300_201102, 1302_QC400_201102, 1302_QC500_201102, 1302_QC301_201103, 1302_QC401_201103, 1302_QC501_201103	**03-Nov-2020**	**11-Nov-2020**	02-May-2021	✓	**11-Nov-2020**	02-May-2021	✓
HDPE (no PTFE) (EP231X)							
1302_MW176_201104, 1302_MW292_201104, 1302_QC302_201104, 1302_QC402_201104, 1302_QC502_201104	**04-Nov-2020**	**11-Nov-2020**	03-May-2021	✓	**11-Nov-2020**	03-May-2021	✓

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 PC Titrator	ED037-P	4	40	**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
Dissolved Organic Carbon	EP002	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	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	0	51	**0.00**	**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
Suspended Solids (High Level)	EA025H	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	4	40	**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
Dissolved Organic Carbon	EP002	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	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	51	**5.88**	**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
Suspended Solids (High Level)	EA025H	6	60	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Organic Carbon	EP002	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	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	51	**5.88**	**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
Suspended Solids (High Level)	EA025H	3	60	**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
Dissolved Organic Carbon	EP002	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	51	**0.00**	**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
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by PC 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 librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
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)
Fluoride by PC Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. 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)
Dissolved Organic Carbon	EP002	WATER	In house: Referenced to APHA 5310 B. This method is compliant with NEPM Schedule B(3). Samples are combusted at high termperature in the presence of an oxidative catalyst. The evolved carbon dioxide is quantified using an IR detector.
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

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)

[redacted]

Work Order	
Amendment	
Client	
Contact	
Address	
E-mail	
Telephone	
Facsimile	
Project	
Order number	
C-O-C number	
Site	
Sampler	

Dates

Date Samples Received	: 06-Nov-2020 09:00	Issue Date	: 18-Nov-2020
Client Requested Due Date	: 13-Nov-2020	Scheduled Reporting Date	: **13-Nov-2020**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 3	Temperature	: 6.6' C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 44 / 43

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
- **Samples QC200, QC201, QC202 and QC203 have been forwarded to NMI.**
- **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 absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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.

ES2039162-048 : [04-Nov-2020] : 1302_MW030_20110 - Extra Sample on Hold

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	Client sampling date / time	Client sample ID	WATER - EA025H Suspended Solids - Standard Level	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP002 Dissolved Organic Carbon (DOC)	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02A Ca, Mg, Na, K, Cl, SO4, Alkalinity & Fluoride
ES2039162-001	02-Nov-2020 10:16	1302_MW194_201102	✓	✓	✓	✓	✓
ES2039162-002	02-Nov-2020 10:38	1302_MW195_201102				✓	
ES2039162-003	02-Nov-2020 10:40	1302_QC100_201102				✓	
ES2039162-005	02-Nov-2020 11:04	1302_MW193_201102				✓	
ES2039162-006	02-Nov-2020 11:41	1302_MW185_201102	✓	✓	✓	✓	✓
ES2039162-007	02-Nov-2020 12:39	1302_MW210_201102				✓	
ES2039162-008	02-Nov-2020 13:13	1302_MW200_201102				✓	
ES2039162-009	02-Nov-2020 13:35	1302_MW180_201102				✓	
ES2039162-010	02-Nov-2020 15:13	1302_MW422_201102				✓	
ES2039162-011	02-Nov-2020 16:38	1302_MW107_201102				✓	
ES2039162-012	02-Nov-2020 16:39	1302_QC101_201102				✓	
ES2039162-014	02-Nov-2020 16:53	1302_MW103_201102	✓	✓	✓	✓	✓
ES2039162-015	02-Nov-2020 17:26	1302_MW141_201102				✓	
ES2039162-016	03-Nov-2020 08:35	1302_MW211_201103	✓	✓	✓	✓	✓
ES2039162-017	03-Nov-2020 09:08	1302_MW144_201103				✓	
ES2039162-018	03-Nov-2020 09:50	1302_MW205_201103				✓	
ES2039162-019	03-Nov-2020 10:17	1302_MW112_201103				✓	
ES2039162-020	03-Nov-2020 10:18	1302_QC102_201103				✓	
ES2039162-022	03-Nov-2020 10:34	1302_MW156_201103				✓	
ES2039162-023	03-Nov-2020 10:54	1302_MW115_201103				✓	
ES2039162-024	03-Nov-2020 12:01	1302_MW240_201103				✓	
ES2039162-025	03-Nov-2020 12:02	1302_MW241_201103				✓	
ES2039162-026	03-Nov-2020 13:10	1302_MW197_201103				✓	
ES2039162-027	03-Nov-2020 13:11	1302_MW215_201103				✓	
ES2039162-028	03-Nov-2020 14:26	1302_MW128_201103				✓	
ES2039162-029	03-Nov-2020 15:00	1302_MW148_201103	✓	✓	✓	✓	✓
ES2039162-030	03-Nov-2020 15:53	1302_MW303_201103	✓	✓	✓	✓	✓
ES2039162-031	03-Nov-2020 16:07	1302_QC103_201103	✓	✓	✓	✓	✓
ES2039162-033	03-Nov-2020 16:29	1302_MW191_201103	✓	✓	✓	✓	✓
ES2039162-034	03-Nov-2020 16:54	1302_MW209_201103	✓	✓	✓	✓	✓
ES2039162-035	03-Nov-2020 17:50	1302_QC300_201102				✓	
ES2039162-036	03-Nov-2020 17:50	1302_QC400_201102				✓	
ES2039162-037	03-Nov-2020 17:51	1302_QC500_201102				✓	

			WATER - EA025H Suspended Solids - Standard Level	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP002 Dissolved Organic Carbon (DOC)	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02A Ca, Mg, Na, K, Cl, SO4, Alkalinity & Fluoride
ES2039162-038	03-Nov-2020 18:03	1302_QC301_201103				✓	
ES2039162-039	03-Nov-2020 18:04	1302_QC401_201103				✓	
ES2039162-040	03-Nov-2020 18:04	1302_QC501_201103				✓	
ES2039162-041	04-Nov-2020 17:21	1302_MW176_201104	✓	✓	✓	✓	✓
ES2039162-042	04-Nov-2020 17:52	1302_MW292_201104	✓	✓	✓	✓	✓
ES2039162-043	04-Nov-2020 18:07	1302_QC302_201104				✓	
ES2039162-044	04-Nov-2020 18:08	1302_QC402_201104				✓	
ES2039162-045	04-Nov-2020 18:35	1302_QC502_201104				✓	
ES2039162-046	02-Nov-2020 00:00	1302_MW139_201104				✓	
ES2039162-047	02-Nov-2020 00:00	1302_MW297_201104				✓	

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV) — Email

APCORP

- A4 - AU Tax Invoice (INV) — Email

[redacted]

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

[redacted]

- *AU Certificate of Analysis - NATA (COA) — Email
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email
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- EDI Format - ESDAT (ESDAT) — Email
- EDI Format - XTab (XTAB) — Email

DERP ESDAT REPORTS

- EDI Format - ESDAT (ESDAT) — Email

[redacted]

- *AU Certificate of Analysis - NATA (COA) — Email
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI) — Email
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- EDI Format - XTab (XTAB) — Email

[redacted]

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- Chain of Custody (CoC) (COC) — Email
- EDI Format - ENMRG (ENMRG) — Email
- EDI Format - ESDAT (ESDAT) — Email
- EDI Format - XTab (XTAB) — Email

[redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	[redacted]
Client	
Contact	
Address	
Telephone	
Project	
Order number	
C-O-C number	
Sampler	
Site	
Quote number	
No. of samples received	
No. of samples analysed	

IATA

...itation No. 825
...mpliance with
...7025 - 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*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
	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 Contact 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: Poor matrix spike recovery due to matrix interferences(confirmed by re-analysis).
- 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.
- EP231X: Poor duplicate precision due to sample heterogeneity. Confirmed by re-extraction and re-analysis.
- EP231X (Biota): ALS NATA accreditation for PFAS in Biota covers all Perfluoroalkyl Sulfonic Acids, Perfluoroalkyl Carboxylic Acids and (n:2) Fluorotelomer Sulfonic Acids in fish (whole and muscle), plants and vegetable matrices, with the exception PFBA (fish only), EtFOSA, MeFOSE, EtFOSE, MeFOSAA, EtFOSAA.
- 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: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA154_201103	1302_BIOAFA155_201103	1302_BIOAFA156_201103	1302_BIOAFA157_201103	1302_BIOAFA158_201103
				Sampling date / time	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00
					ES2040589-001	ES2040589-002	ES2040589-003	ES2040589-004	ES2040589-005
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø Sample Description	----	-	--		**fillets**	**fillets**	**fillets**	**fillets**	**fillets**
ø Weight of Sample Prepared	----	0.1	g		**68.8**	**67.8**	**31.5**	**38.8**	**40.5**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		<1	<1	**3**	**3**	**5**
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		<1	<1	**1**	**1**	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		<1	<1	**4**	**4**	**5**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA154_20103	1302_BIOAFA155_20103	1302_BIOAFA156_20103	1302_BIOAFA157_20103	1302_BIOAFA158_20103
				Sampling date / time	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00
					ES2040589-001	ES2040589-002	ES2040589-003	ES2040589-004	ES2040589-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	<1	**4**	**4**	**5**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**108**	**118**	**120**	**115**	**114**
13C8-PFOA	----	1	%		**104**	**112**	**118**	**115**	**118**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA159_201103	1302_BIOAFA160_201103	1302_BIOAFA161_201103	1302_BIOAFA162_201103	1302_BIOAFA164_201103
			Sampling date / time	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00
Compound	CAS Number	LOR	Unit	ES2040589-006	ES2040589-007	ES2040589-008	ES2040589-009	ES2040589-011
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	fillets	fillets	fillets	fillets	fish
ø Weight of Sample Prepared	----	0.1	g	43.5	66.7	54.2	67.0	100
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	<1	<1	2	<1	2
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	<1	2	<1	2
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA** (Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA159_20103	1302_BIOAFA160_20103	1302_BIOAFA161_20103	1302_BIOAFA162_20103	1302_BIOAFA164_20103
				Sampling date / time	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00
					ES2040589-006	ES2040589-007	ES2040589-008	ES2040589-009	ES2040589-011
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	<1	**2**	<1	**2**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**118**	**112**	**112**	**118**	**104**
13C8-PFOA	----	1	%		**119**	**108**	**118**	**114**	**110**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA165_20110 3	1302_BIOAFA166_20110 3	1302_BIOAFA167_20110 3	1302_BIOAFA168_20110 3	1302_BIOAFA170_20110 3
			Sampling date / time	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00
Compound	CAS Number	LOR	Unit	ES2040589-012	ES2040589-013	ES2040589-014	ES2040589-015	ES2040589-017
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	fish	fish	fish	fish	fish
ø Weight of Sample Prepared	----	0.1	g	120	91.7	56.3	34.2	88.2
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	3	<1	7	1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	<1	1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	3	<1	8	1	<1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA** (Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA165_20103	1302_BIOAFA166_20103	1302_BIOAFA167_20103	1302_BIOAFA168_20103	1302_BIOAFA170_20103
				Sampling date / time	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00
					ES2040589-012	ES2040589-013	ES2040589-014	ES2040589-015	ES2040589-017
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**3**	<1	**8**	**1**	<1
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**110**	**102**	**118**	**108**	**117**
13C8-PFOA	----	1	%		**116**	**107**	**116**	**120**	**118**

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA171_201103	1302_BIOAFA172_201103	1302_BIOAFA173_201103	1302_BIOAFA174_201103	1302_BIOAFA175_201103
				Sampling date / time	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00
					ES2040589-018	ES2040589-019	ES2040589-020	ES2040589-021	ES2040589-022
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø Sample Description	----	-	--		fish	fish	sea snail	sea snail	sea snail
ø Weight of Sample Prepared	----	0.1	g		100	61.2	38.4	47.3	45.1
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	2	2	1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		1	<1	25	28	13
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		<1	<1	2	2	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		1	<1	27	30	14
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	7	8	6
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA171_20103	1302_BIOAFA172_20103	1302_BIOAFA173_20103	1302_BIOAFA174_20103	1302_BIOAFA175_20103
				Sampling date / time	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00
Compound	CAS Number	LOR	Unit		ES2040589-018	ES2040589-019	ES2040589-020	ES2040589-021	ES2040589-022
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**1**	<1	**36**	**40**	**21**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**118**	**116**	**113**	**118**	**106**
13C8-PFOA	----	1	%		**117**	**120**	**118**	**120**	**118**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA176_20103	1302_BIOAFA177_20103	1302_BIOAFA178_20104	1302_BIOAFA179_20104	1302_BIOAFA180_20104
			Sampling date / time	03-Nov-2020 00:00	03-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00
Compound	CAS Number	LOR	Unit	ES2040589-023	ES2040589-024	ES2040589-025	ES2040589-026	ES2040589-027
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	sea snail	sea snail	fish fillet	fish fillet	fish fillet
ø Weight of Sample Prepared	----	0.1	g	45.8	44.4	131	71.3	66.0
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	5	6	1	<1	2
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	6	6	1	<1	2
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA176_20110 3	1302_BIOAFA177_20110 3	1302_BIOAFA178_20110 4	1302_BIOAFA179_20110 4	1302_BIOAFA180_20110 4
				Sampling date / time	03-Nov-2020 00:00	03-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00
Compound	CAS Number	LOR	Unit		ES2040589-023	ES2040589-024	ES2040589-025	ES2040589-026	ES2040589-027
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**6**	**6**	**1**	<1	**2**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**101**	**82.0**	**81.5**	**90.0**	**85.5**
13C8-PFOA	----	1	%		**102**	**90.0**	**89.5**	**102**	**90.5**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA181_20110104	1302_BIOAFA182_20110104	1302_BIOAFA183_20110104	1302_BIOAFA184_20110104	1302_BIOAFA186_20110104
			Sampling date / time	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00
Compound	CAS Number	LOR	Unit	ES2040589-028	ES2040589-029	ES2040589-030	ES2040589-031	ES2040589-033
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	fish fillet	fish fillet	fish fillet	fish fillet	fish fillet
ø Weight of Sample Prepared	----	0.1	g	62.3	52.4	85.0	82.6	116
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	2	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	5	3	8	4	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	2	<1	1	1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	7	3	9	5	<1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA** (Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA181_20110104	1302_BIOAFA182_20110104	1302_BIOAFA183_20110104	1302_BIOAFA184_20110104	1302_BIOAFA186_20110104
				Sampling date / time	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00
					ES2040589-028	ES2040589-029	ES2040589-030	ES2040589-031	ES2040589-033
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**9**	**3**	**9**	**5**	<1
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**97.0**	**85.0**	**99.0**	**96.5**	**118**
13C8-PFOA	----	1	%		**101**	**108**	**110**	**109**	**116**

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA187_20110104	1302_BIOAFA189_20110104	1302_BIOAFA190_20110104	1302_BIOAFA191_20110104	1302_BIOAFA192_20110104
				Sampling date / time	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00
					ES2040589-034	ES2040589-036	ES2040589-037	ES2040589-038	ES2040589-039
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø Sample Description	----	-	--		**fish fillet**	**fish fillet**	**fish fillet**	**fish fillet**	**fish fillet**
ø Weight of Sample Prepared	----	0.1	g		**110**	**102**	**76.4**	**72.4**	**39.8**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		<1	**14**	**17**	**7**	**4**
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		<1	**1**	**2**	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		<1	**15**	**19**	**7**	**4**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA** (Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA187_20110104	1302_BIOAFA189_20110104	1302_BIOAFA190_20110104	1302_BIOAFA191_20110104	1302_BIOAFA192_20110104
				Sampling date / time	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00
					ES2040589-034	ES2040589-036	ES2040589-037	ES2040589-038	ES2040589-039
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	**15**	**19**	**7**	**4**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**105**	**94.5**	**74.5**	**90.5**	**87.5**
13C8-PFOA	----	1	%		**108**	**109**	**97.0**	**96.5**	**116**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA193_201104	1302_BIOAFA194_201104	1302_BIOAFA195_201104	1302_BIOAFA196_201107	1302_BIOAFA197_201107
			Sampling date / time	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00	07-Nov-2020 00:00	07-Nov-2020 00:00
Compound	CAS Number	LOR	Unit	ES2040589-040	ES2040589-041	ES2040589-042	ES2040589-043	ES2040589-044
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	fish fillet	fish fillet	fish fillet	yabbies	fish fillet
ø Weight of Sample Prepared	----	0.1	g	42.6	51.6	46.3	39.8	54.9
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	8	6
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	<1	<1	4	12	4
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	<1	4	3	2
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	<1	8	15	6
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA** (Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA193_201104	1302_BIOAFA194_201104	1302_BIOAFA195_201104	1302_BIOAFA196_201107	1302_BIOAFA197_201107
				Sampling date / time	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00	07-Nov-2020 00:00	07-Nov-2020 00:00
					ES2040589-040	ES2040589-041	ES2040589-042	ES2040589-043	ES2040589-044
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	<1	**8**	**24**	**12**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**94.0**	**112**	**116**	**114**	**102**
13C8-PFOA	----	1	%		**109**	**116**	**116**	**106**	**100**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA199_201108	1302_BIOAFA201_201112	1302_BIOAFA202_201112	1302_QC122_201103	1302_QC123_201103
			Sampling date / time	08-Nov-2020 00:00	12-Nov-2020 00:00	12-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00
Compound	CAS Number	LOR	Unit	ES2040589-046	ES2040589-048	ES2040589-049	ES2040589-052	ES2040589-053
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	yabbies	yabbies	yabbies	fish fillets	fish fillets
ø Weight of Sample Prepared	----	0.1	g	13.4	35.4	26.4	51.4	59.2
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	2	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	8	2	2	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	3	3	2	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	1	1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	4	4	2	<1	<1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	2	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA199_201108	1302_BIOAFA201_201112	1302_BIOAFA202_201112	1302_QC122_201103	1302_QC123_201103
				Sampling date / time	08-Nov-2020 00:00	12-Nov-2020 00:00	12-Nov-2020 00:00	03-Nov-2020 00:00	03-Nov-2020 00:00
Compound	CAS Number	LOR	Unit		ES2040589-046	ES2040589-048	ES2040589-049	ES2040589-052	ES2040589-053
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**16**	**6**	**5**	<1	<1
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**104**	**90.5**	**100**	**102**	**106**
13C8-PFOA	----	1	%		**114**	**102**	**114**	**95.0**	**100**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_QC126_201104	1302_QC128_201104	1302_QC129_201104	----	----
			Sampling date / time	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00	----	----
Compound	CAS Number	LOR	Unit	ES2040589-056	ES2040589-058	ES2040589-059	--------	--------
				Result	Result	Result	----	----
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	fish fillets	fish fillets	fish fillets	----	----
ø Weight of Sample Prepared	----	0.1	g	93.0	49.5	57.6	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	----	----
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	1	1	2	----	----
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	1	1	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	1	2	3	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	----	----
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	----	----

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_QC126_201104	1302_QC128_201104	1302_QC129_201104	----	----
				Sampling date / time	04-Nov-2020 00:00	04-Nov-2020 00:00	04-Nov-2020 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2040589-056	ES2040589-058	ES2040589-059	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	----	----
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**1**	**2**	**3**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**108**	**102**	**100**	----	----
13C8-PFOA	----	1	%		**98.0**	**96.5**	**96.5**	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC121_201103	1302_QC302_201105	1302_QC502_201106	1302_SW007_201103	1302_SW008_201104
				Sampling date / time	03-Nov-2020 00:00	05-Nov-2020 00:00	06-Nov-2020 00:00	03-Nov-2020 00:00	04-Nov-2020 00:00
Compound	CAS Number	LOR	Unit		ES2040589-051	ES2040589-060	ES2040589-061	ES2040589-062	ES2040589-063
					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	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.03**
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	**0.07**
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: WATER (Matrix: WATER)				Sample ID	1302_QC121_201103	1302_QC302_201105	1302_QC502_201106	1302_SW007_201103	1302_SW008_201104
				Sampling date / time	03-Nov-2020 00:00	05-Nov-2020 00:00	06-Nov-2020 00:00	03-Nov-2020 00:00	04-Nov-2020 00:00
Compound	CAS Number	LOR	Unit		ES2040589-051	ES2040589-060	ES2040589-061	ES2040589-062	ES2040589-063
					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	**0.10**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.10**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.10**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**119**	**101**	**112**	**98.5**	**106**
13C8-PFOA	----	0.02	%		**120**	**120**	**120**	**120**	**119**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW009_201103	1302_SW010_201107	1302_SW011_201107	1302_SW012_201107	----
				Sampling date / time	03-Nov-2020 00:00	07-Nov-2020 00:00	07-Nov-2020 00:00	07-Nov-2020 00:00	----
Compound	CAS Number	LOR	Unit		ES2040589-064	ES2040589-065	ES2040589-066	ES2040589-067	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.04**	**0.05**	**0.03**	**0.02**	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.02**	**0.04**	**0.02**	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**0.30**	**0.33**	**0.20**	**0.14**	----
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		**0.94**	**0.82**	**0.45**	**0.32**	----
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		**0.04**	**0.05**	**0.03**	**0.02**	----
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		**0.02**	**0.02**	**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	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW009_201103	1302_SW010_201107	1302_SW011_201107	1302_SW012_201107	----
				Sampling date / time	03-Nov-2020 00:00	07-Nov-2020 00:00	07-Nov-2020 00:00	07-Nov-2020 00:00	----
Compound	CAS Number	LOR	Unit		ES2040589-064	ES2040589-065	ES2040589-066	ES2040589-067	--------
					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	----
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	----
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		**1.36**	**1.31**	**0.74**	**0.50**	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.24**	**1.15**	**0.65**	**0.46**	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.34**	**1.27**	**0.72**	**0.50**	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**117**	**107**	**111**	----
13C8-PFOA	----	0.02	%		**116**	**119**	**119**	**119**	----

Surrogate Control Limits

Sub-Matrix: **BIOTA**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	50	130
13C8-PFOA	----	50	130

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	[redacted]
Client	
Contact	
Address	
Telephone	
Project	
Order number	
C-O-C number	
Sampler	
Site	
Quote number	
No. of samples received	
No. of samples analysed	

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*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
	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

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: **BIOTA**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3377787)									
ES2040589-001	1302_BIOAFA154_201103	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.00	No Limit
ES2040589-012	1302_BIOAFA165_201103	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	3	4	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3377788)									
ES2040589-023	1302_BIOAFA176_201103	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	6	9	45.5	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.00	No Limit
ES2040589-034	1302_BIOAFA187_201104	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.00	No Limit

Sub-Matrix: **BIOTA**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3382919)									
ES2040589-046	1302_BIOAFA199_201108	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	2	1	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	8	4	55.8	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	4	3	47.1	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3377787)									
ES2040589-001	1302_BIOAFA154_201103	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.00	No Limit
ES2040589-012	1302_BIOAFA165_201103	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3377788)									
ES2040589-023	1302_BIOAFA176_201103	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.00	No Limit

Sub-Matrix: **BIOTA**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3377788) - continued									
ES2040589-023	1302_BIOAFA176_201103	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.00	No Limit
ES2040589-034	1302_BIOAFA187_201104	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3382919)									
ES2040589-046	1302_BIOAFA199_201108	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	2	<1	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3377787)									
ES2040589-001	1302_BIOAFA154_201103	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.00	No Limit
ES2040589-012	1302_BIOAFA165_201103	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.00	No Limit

Sub-Matrix: **BIOTA**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3377787) - continued									
ES2040589-012	1302_BIOAFA165_201103	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3377788)									
ES2040589-023	1302_BIOAFA176_201103	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.00	No Limit
ES2040589-034	1302_BIOAFA187_201104	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3382919)									
ES2040589-046	1302_BIOAFA199_201108	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.00	No Limit

Sub-Matrix: **BIOTA**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3382919) - continued									
ES2040589-046	1302_BIOAFA199_201108	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3377787)									
ES2040589-001	1302_BIOAFA154_201103	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.00	No Limit
ES2040589-012	1302_BIOAFA165_201103	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3377788)									
ES2040589-023	1302_BIOAFA176_201103	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.00	No Limit
ES2040589-034	1302_BIOAFA187_201104	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.00	No Limit

Sub-Matrix: **BIOTA**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3377788) - continued									
ES2040589-034	1302_BIOAFA187_201104	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3382919)									
ES2040589-046	1302_BIOAFA199_201108	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 3377787)									
ES2040589-001	1302_BIOAFA154_201103	EP231X: Sum of PFAS	----	1	µg/kg	<1	<1	0.00	No Limit
ES2040589-012	1302_BIOAFA165_201103	EP231X: Sum of PFAS	----	1	µg/kg	3	4	28.6	No Limit
EP231P: PFAS Sums (QC Lot: 3377788)									
ES2040589-023	1302_BIOAFA176_201103	EP231X: Sum of PFAS	----	1	µg/kg	6	9	40.0	No Limit
ES2040589-034	1302_BIOAFA187_201104	EP231X: Sum of PFAS	----	1	µg/kg	<1	<1	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 3382919)									
ES2040589-046	1302_BIOAFA199_201108	EP231X: Sum of PFAS	----	1	µg/kg	16	# 8	66.7	0% - 50%

Method Blank (MB) and Laboratory Control Spike (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 Spike (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: **BIOTA**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3377787)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	5 µg/kg	81.2	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	5 µg/kg	76.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	5 µg/kg	80.4	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	5 µg/kg	80.4	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	5 µg/kg	107	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<1	5 µg/kg	95.2	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3377788)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	5 µg/kg	76.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	5 µg/kg	87.6	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	5 µg/kg	76.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	5 µg/kg	98.0	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	5 µg/kg	86.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<1	5 µg/kg	92.8	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3382919)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	5 µg/kg	84.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	5 µg/kg	74.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	5 µg/kg	78.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	5 µg/kg	114	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	5 µg/kg	97.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<1	5 µg/kg	118	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3377787)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	25 µg/kg	97.9	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<1	5 µg/kg	90.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	5 µg/kg	85.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	5 µg/kg	94.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	5 µg/kg	96.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	5 µg/kg	83.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	5 µg/kg	87.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	5 µg/kg	98.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<1	5 µg/kg	92.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<1	5 µg/kg	85.2	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	12.5 µg/kg	73.1	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3377788)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	25 µg/kg	86.1	71.0	135

Sub-Matrix: **BIOTA**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3377788) - continued								
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<1	5 µg/kg	83.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	5 µg/kg	75.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	5 µg/kg	85.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	5 µg/kg	89.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	5 µg/kg	88.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	5 µg/kg	86.8	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	5 µg/kg	110	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<1	5 µg/kg	91.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<1	5 µg/kg	100	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	12.5 µg/kg	90.4	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3382919)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	25 µg/kg	86.9	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<1	5 µg/kg	76.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	5 µg/kg	78.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	5 µg/kg	87.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	5 µg/kg	88.8	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	5 µg/kg	88.4	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	5 µg/kg	83.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	5 µg/kg	96.8	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<1	5 µg/kg	104	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<1	5 µg/kg	120	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	12.5 µg/kg	88.0	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3377787)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<1	5 µg/kg	80.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<2	12.5 µg/kg	101	88.1	105
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	12.5 µg/kg	82.6	81.6	144
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	12.5 µg/kg	# 67.7	84.7	135
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	12.5 µg/kg	88.6	20.5	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	5 µg/kg	81.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	5 µg/kg	76.0	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3377788)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<1	5 µg/kg	101	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<2	12.5 µg/kg	91.5	88.1	105
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	12.5 µg/kg	95.8	81.6	144

Sub-Matrix: **BIOTA**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3377788) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	12.5 µg/kg	119	84.7	135
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	12.5 µg/kg	85.8	20.5	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	5 µg/kg	106	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	5 µg/kg	88.4	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3382919)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<1	5 µg/kg	101	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<2	12.5 µg/kg	104	88.1	105
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	12.5 µg/kg	94.1	81.6	144
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	12.5 µg/kg	116	84.7	135
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	12.5 µg/kg	89.0	20.5	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	5 µg/kg	83.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	5 µg/kg	100	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3377787)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	5 µg/kg	90.0	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	5 µg/kg	82.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	5 µg/kg	83.2	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	5 µg/kg	94.0	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3377788)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	5 µg/kg	74.0	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	5 µg/kg	78.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	5 µg/kg	99.2	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	5 µg/kg	94.0	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3382919)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	5 µg/kg	84.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	5 µg/kg	84.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	5 µg/kg	86.0	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	5 µg/kg	95.2	93.4	130
EP231P: PFAS Sums (QCLot: 3377787)								
EP231X: Sum of PFAS	----	1	µg/kg	<1	----	----	----	----
EP231P: PFAS Sums (QCLot: 3377788)								

Sub-Matrix: **BIOTA**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP231P: PFAS Sums (QCLot: 3377788) - continued								
EP231X: Sum of PFAS	----	1	µg/kg	<1	----	----	----	----
EP231P: PFAS Sums (QCLot: 3382919)								
EP231X: Sum of PFAS	----	1	µg/kg	<1	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3376361)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	93.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	72.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	71.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	69.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	106	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	112	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3376361)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	76.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	72.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	85.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	98.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	107	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	87.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	85.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	86.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3376361)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	68.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	96.6	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	83.7	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	66.6	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	89.9	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	74.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	82.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3376361)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3376361) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	89.0	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	78.4	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	107	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	102	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: **BIOTA**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3377787)							
ES2040589-002	1302_BIOAFA155_201103	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	5 µg/kg	89.6	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	5 µg/kg	87.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	5 µg/kg	92.8	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	5 µg/kg	96.0	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	5 µg/kg	98.8	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	5 µg/kg	111	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3377788)							
ES2040589-024	1302_BIOAFA177_201103	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	5 µg/kg	97.6	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	5 µg/kg	108	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	5 µg/kg	89.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	5 µg/kg	113	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	5 µg/kg	85.6	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	5 µg/kg	121	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3382919)							
ES2040589-048	1302_BIOAFA201_201112	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	5 µg/kg	86.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	5 µg/kg	97.6	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	5 µg/kg	105	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	5 µg/kg	109	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	5 µg/kg	125	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	5 µg/kg	117	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3377787)							
ES2040589-002	1302_BIOAFA155_201103	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	25 µg/kg	106	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	5 µg/kg	87.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	5 µg/kg	87.6	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	5 µg/kg	99.2	71.0	131

Sub-Matrix: **BIOTA**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3377787) - continued							
ES2040589-002	1302_BIOAFA155_201103	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	5 µg/kg	106	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	5 µg/kg	86.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	5 µg/kg	95.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	5 µg/kg	111	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	5 µg/kg	105	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	5 µg/kg	94.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	12.5 µg/kg	71.0	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3377788)							
ES2040589-024	1302_BIOAFA177_201103	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	25 µg/kg	93.4	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	5 µg/kg	# 68.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	5 µg/kg	98.8	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	5 µg/kg	114	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	5 µg/kg	113	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	5 µg/kg	122	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	5 µg/kg	111	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	5 µg/kg	113	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	5 µg/kg	98.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	5 µg/kg	104	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	12.5 µg/kg	97.6	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3382919)							
ES2040589-048	1302_BIOAFA201_201112	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	25 µg/kg	86.6	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	5 µg/kg	80.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	5 µg/kg	71.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	5 µg/kg	81.2	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	5 µg/kg	82.4	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	5 µg/kg	84.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	5 µg/kg	75.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	5 µg/kg	88.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	5 µg/kg	93.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	5 µg/kg	119	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	12.5 µg/kg	76.0	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3377787)							
ES2040589-002	1302_BIOAFA155_201103	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	5 µg/kg	82.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	12.5 µg/kg	# 110	88.1	105
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	12.5 µg/kg	88.3	81.6	144
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	12.5 µg/kg	# 79.5	84.7	135

Sub-Matrix: **BIOTA**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3377787) - continued							
ES2040589-002	1302_BIOAFA155_201103	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	12.5 µg/kg	78.9	20.5	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	5 µg/kg	77.6	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	5 µg/kg	77.6	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3377788)							
ES2040589-024	1302_BIOAFA177_201103	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	5 µg/kg	102	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	12.5 µg/kg	# 114	88.1	105
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	12.5 µg/kg	113	81.6	144
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	12.5 µg/kg	98.9	84.7	135
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	12.5 µg/kg	96.0	20.5	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	5 µg/kg	93.6	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	5 µg/kg	101	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3382919)							
ES2040589-048	1302_BIOAFA201_201112	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	5 µg/kg	92.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	12.5 µg/kg	95.7	88.1	105
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	12.5 µg/kg	86.7	81.6	144
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	12.5 µg/kg	121	84.7	135
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	12.5 µg/kg	99.7	20.5	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	5 µg/kg	67.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	5 µg/kg	75.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3377787)							
ES2040589-002	1302_BIOAFA155_201103	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	5 µg/kg	92.4	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	5 µg/kg	86.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	5 µg/kg	100	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	5 µg/kg	97.2	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3377788)							
ES2040589-024	1302_BIOAFA177_201103	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	5 µg/kg	118	62.0	145

Sub-Matrix: **BIOTA**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3377788) - continued							
ES2040589-024	1302_BIOAFA177_201103	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	5 µg/kg	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	5 µg/kg	108	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	5 µg/kg	117	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3382919)							
ES2040589-048	1302_BIOAFA201_201112	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	5 µg/kg	84.4	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	5 µg/kg	115	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	5 µg/kg	70.0	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	5 µg/kg	96.4	93.4	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	[redacted]
Client	
Contact	
Project	
Site	
Sampler	
Order number	

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.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **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: **BIOTA**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP231P: PFAS Sums	ES2040589--046	1302_BIOAFA199_201108	**Sum of PFAS**	----	66.7 %	0% - 50%	**RPD exceeds LOR based limits**
Laboratory Control Spike (LCS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	QC-3377787-002	----	**N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)**	24448-09-7	67.7 %	84.7-135%	**Recovery less than lower control limit**
Matrix Spike (MS) Recoveries							
EP231B: Perfluoroalkyl Carboxylic Acids	ES2040589--024	1302_BIOAFA177_201103	**Perfluoropentanoic acid (PFPeA)**	2706-90-3	68.8 %	69.0-132%	**Recovery less than lower data quality objective**
EP231C: Perfluoroalkyl Sulfonamides	ES2040589--002	1302_BIOAFA155_201103	**N-Methyl perfluorooctane sulfonamide (MeFOSA)**	31506-32-8	110 %	88.1-105%	**Recovery greater than upper data quality objective**
EP231C: Perfluoroalkyl Sulfonamides	ES2040589--024	1302_BIOAFA177_201103	**N-Methyl perfluorooctane sulfonamide (MeFOSA)**	31506-32-8	114 %	88.1-105%	**Recovery greater than upper data quality objective**
EP231C: Perfluoroalkyl Sulfonamides	ES2040589--002	1302_BIOAFA155_201103	**N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)**	24448-09-7	79.5 %	84.7-135%	**Recovery less than lower data quality objective**

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	0	19	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	19	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: **BIOTA**

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

Matrix: **BIOTA**

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
Biota Sample Pre-Preparation							
Snap Lock Bag - frozen (Biota-PP)							
1302_BIOAFA154_201103, 1302_BIOAFA155_201103, 1302_BIOAFA156_201103, 1302_BIOAFA157_201103, 1302_BIOAFA158_201103, 1302_BIOAFA159_201103, 1302_BIOAFA160_201103, 1302_BIOAFA161_201103, 1302_BIOAFA162_201103, 1302_BIOAFA164_201103, 1302_BIOAFA165_201103, 1302_BIOAFA166_201103, 1302_BIOAFA167_201103, 1302_BIOAFA168_201103, 1302_BIOAFA170_201103, 1302_BIOAFA171_201103, 1302_BIOAFA172_201103, 1302_BIOAFA173_201103, 1302_BIOAFA174_201103, 1302_BIOAFA175_201103, 1302_BIOAFA176_201103, 1302_BIOAFA177_201103	03-Nov-2020	23-Nov-2020	----	----	**----**	----	----
Snap Lock Bag - frozen (Biota-PP)							
1302_QC122_201103, 1302_QC123_201103	03-Nov-2020	25-Nov-2020	----	----	**----**	----	----
Snap Lock Bag - frozen (Biota-PP)							
1302_BIOAFA178_201104, 1302_BIOAFA179_201104, 1302_BIOAFA180_201104, 1302_BIOAFA181_201104, 1302_BIOAFA182_201104, 1302_BIOAFA183_201104, 1302_BIOAFA184_201104, 1302_BIOAFA186_201104, 1302_BIOAFA187_201104, 1302_BIOAFA189_201104, 1302_BIOAFA190_201104, 1302_BIOAFA191_201104, 1302_BIOAFA192_201104, 1302_BIOAFA193_201104, 1302_BIOAFA194_201104, 1302_BIOAFA195_201104	04-Nov-2020	23-Nov-2020	----	----	**----**	----	----
Snap Lock Bag - frozen (Biota-PP)							
1302_QC126_201104, 1302_QC128_201104, 1302_QC129_201104	04-Nov-2020	25-Nov-2020	----	----	**----**	----	----
Snap Lock Bag - frozen (Biota-PP)							
1302_BIOAFA196_201107, 1302_BIOAFA197_201107	07-Nov-2020	23-Nov-2020	----	----	**----**	----	----
Snap Lock Bag - frozen (Biota-PP)							
1302_BIOAFA199_201108	08-Nov-2020	25-Nov-2020	----	----	**----**	----	----
Snap Lock Bag - frozen (Biota-PP)							
1302_BIOAFA201_201112, 1302_BIOAFA202_201112	12-Nov-2020	25-Nov-2020	----	----	**----**	----	----

Matrix: **BIOTA**

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							
Snap Lock Bag - frozen (EP231-PFOS-SP)							
1302_BIOAFA154_201103, 1302_BIOAFA155_201103, 1302_BIOAFA156_201103, 1302_BIOAFA157_201103, 1302_BIOAFA158_201103, 1302_BIOAFA159_201103, 1302_BIOAFA160_201103, 1302_BIOAFA161_201103, 1302_BIOAFA162_201103, 1302_BIOAFA164_201103, 1302_BIOAFA165_201103, 1302_BIOAFA166_201103, 1302_BIOAFA167_201103, 1302_BIOAFA168_201103, 1302_BIOAFA170_201103, 1302_BIOAFA171_201103, 1302_BIOAFA172_201103, 1302_BIOAFA173_201103, 1302_BIOAFA174_201103, 1302_BIOAFA175_201103	**03-Nov-2020**	**25-Nov-2020**	02-May-2021	✓	**25-Nov-2020**	04-Jan-2021	✓
Snap Lock Bag - frozen (EP231-PFOS-SP)							
1302_BIOAFA176_201103, 1302_BIOAFA177_201103, 1302_QC122_201103, 1302_QC123_201103	**03-Nov-2020**	**26-Nov-2020**	02-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231-PFOS-SP)							
1302_BIOAFA178_201104, 1302_BIOAFA179_201104, 1302_BIOAFA180_201104, 1302_BIOAFA181_201104, 1302_BIOAFA182_201104, 1302_BIOAFA183_201104, 1302_BIOAFA184_201104, 1302_BIOAFA186_201104, 1302_BIOAFA187_201104, 1302_BIOAFA189_201104, 1302_BIOAFA190_201104, 1302_BIOAFA191_201104, 1302_BIOAFA192_201104, 1302_BIOAFA193_201104, 1302_BIOAFA194_201104, 1302_BIOAFA195_201104, 1302_QC126_201104, 1302_QC128_201104, 1302_QC129_201104	**04-Nov-2020**	**26-Nov-2020**	03-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231-PFOS-SP)							
1302_BIOAFA196_201107, 1302_BIOAFA197_201107	**07-Nov-2020**	**26-Nov-2020**	06-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231-PFOS-SP)							
1302_BIOAFA199_201108	**08-Nov-2020**	**26-Nov-2020**	07-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231-PFOS-SP)							
1302_BIOAFA201_201112, 1302_BIOAFA202_201112	**12-Nov-2020**	**26-Nov-2020**	11-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓

Matrix: **BIOTA**

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							
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA154_201103, 1302_BIOAFA155_201103, 1302_BIOAFA156_201103, 1302_BIOAFA157_201103, 1302_BIOAFA158_201103, 1302_BIOAFA159_201103, 1302_BIOAFA160_201103, 1302_BIOAFA161_201103, 1302_BIOAFA162_201103, 1302_BIOAFA164_201103, 1302_BIOAFA165_201103, 1302_BIOAFA166_201103, 1302_BIOAFA167_201103, 1302_BIOAFA168_201103, 1302_BIOAFA170_201103, 1302_BIOAFA171_201103, 1302_BIOAFA172_201103, 1302_BIOAFA173_201103, 1302_BIOAFA174_201103, 1302_BIOAFA175_201103	**03-Nov-2020**	**25-Nov-2020**	02-May-2021	✓	**25-Nov-2020**	04-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA176_201103, 1302_BIOAFA177_201103, 1302_QC122_201103, 1302_QC123_201103	**03-Nov-2020**	**26-Nov-2020**	02-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA178_201104, 1302_BIOAFA179_201104, 1302_BIOAFA180_201104, 1302_BIOAFA181_201104, 1302_BIOAFA182_201104, 1302_BIOAFA183_201104, 1302_BIOAFA184_201104, 1302_BIOAFA186_201104, 1302_BIOAFA187_201104, 1302_BIOAFA189_201104, 1302_BIOAFA190_201104, 1302_BIOAFA191_201104, 1302_BIOAFA192_201104, 1302_BIOAFA193_201104, 1302_BIOAFA194_201104, 1302_BIOAFA195_201104, 1302_QC126_201104, 1302_QC128_201104, 1302_QC129_201104	**04-Nov-2020**	**26-Nov-2020**	03-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA196_201107, 1302_BIOAFA197_201107	**07-Nov-2020**	**26-Nov-2020**	06-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA199_201108	**08-Nov-2020**	**26-Nov-2020**	07-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA201_201112, 1302_BIOAFA202_201112	**12-Nov-2020**	**26-Nov-2020**	11-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓

Matrix: **BIOTA**

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							
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA154_201103, 1302_BIOAFA155_201103, 1302_BIOAFA156_201103, 1302_BIOAFA157_201103, 1302_BIOAFA158_201103, 1302_BIOAFA159_201103, 1302_BIOAFA160_201103, 1302_BIOAFA161_201103, 1302_BIOAFA162_201103, 1302_BIOAFA164_201103, 1302_BIOAFA165_201103, 1302_BIOAFA166_201103, 1302_BIOAFA167_201103, 1302_BIOAFA168_201103, 1302_BIOAFA170_201103, 1302_BIOAFA171_201103, 1302_BIOAFA172_201103, 1302_BIOAFA173_201103, 1302_BIOAFA174_201103, 1302_BIOAFA175_201103	**03-Nov-2020**	**25-Nov-2020**	02-May-2021	✓	**25-Nov-2020**	04-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA176_201103, 1302_BIOAFA177_201103, 1302_QC122_201103, 1302_QC123_201103	**03-Nov-2020**	**26-Nov-2020**	02-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA178_201104, 1302_BIOAFA179_201104, 1302_BIOAFA180_201104, 1302_BIOAFA181_201104, 1302_BIOAFA182_201104, 1302_BIOAFA183_201104, 1302_BIOAFA184_201104, 1302_BIOAFA186_201104, 1302_BIOAFA187_201104, 1302_BIOAFA189_201104, 1302_BIOAFA190_201104, 1302_BIOAFA191_201104, 1302_BIOAFA192_201104, 1302_BIOAFA193_201104, 1302_BIOAFA194_201104, 1302_BIOAFA195_201104, 1302_QC126_201104, 1302_QC128_201104, 1302_QC129_201104	**04-Nov-2020**	**26-Nov-2020**	03-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA196_201107, 1302_BIOAFA197_201107	**07-Nov-2020**	**26-Nov-2020**	06-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA199_201108	**08-Nov-2020**	**26-Nov-2020**	07-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA201_201112, 1302_BIOAFA202_201112	**12-Nov-2020**	**26-Nov-2020**	11-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓

Matrix: **BIOTA**

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							
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA154_201103, 1302_BIOAFA155_201103, 1302_BIOAFA156_201103, 1302_BIOAFA157_201103, 1302_BIOAFA158_201103, 1302_BIOAFA159_201103, 1302_BIOAFA160_201103, 1302_BIOAFA161_201103, 1302_BIOAFA162_201103, 1302_BIOAFA164_201103, 1302_BIOAFA165_201103, 1302_BIOAFA166_201103, 1302_BIOAFA167_201103, 1302_BIOAFA168_201103, 1302_BIOAFA170_201103, 1302_BIOAFA171_201103, 1302_BIOAFA172_201103, 1302_BIOAFA173_201103, 1302_BIOAFA174_201103, 1302_BIOAFA175_201103	**03-Nov-2020**	**25-Nov-2020**	02-May-2021	✓	**25-Nov-2020**	04-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA176_201103, 1302_BIOAFA177_201103, 1302_QC122_201103, 1302_QC123_201103	**03-Nov-2020**	**26-Nov-2020**	02-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA178_201104, 1302_BIOAFA179_201104, 1302_BIOAFA180_201104, 1302_BIOAFA181_201104, 1302_BIOAFA182_201104, 1302_BIOAFA183_201104, 1302_BIOAFA184_201104, 1302_BIOAFA186_201104, 1302_BIOAFA187_201104, 1302_BIOAFA189_201104, 1302_BIOAFA190_201104, 1302_BIOAFA191_201104, 1302_BIOAFA192_201104, 1302_BIOAFA193_201104, 1302_BIOAFA194_201104, 1302_BIOAFA195_201104, 1302_QC126_201104, 1302_QC128_201104, 1302_QC129_201104	**04-Nov-2020**	**26-Nov-2020**	03-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA196_201107, 1302_BIOAFA197_201107	**07-Nov-2020**	**26-Nov-2020**	06-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA199_201108	**08-Nov-2020**	**26-Nov-2020**	07-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA201_201112, 1302_BIOAFA202_201112	**12-Nov-2020**	**26-Nov-2020**	11-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓

Matrix: **BIOTA**

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
EP231P: PFAS Sums							
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA154_201103, 1302_BIOAFA155_201103, 1302_BIOAFA156_201103, 1302_BIOAFA157_201103, 1302_BIOAFA158_201103, 1302_BIOAFA159_201103, 1302_BIOAFA160_201103, 1302_BIOAFA161_201103, 1302_BIOAFA162_201103, 1302_BIOAFA164_201103, 1302_BIOAFA165_201103, 1302_BIOAFA166_201103, 1302_BIOAFA167_201103, 1302_BIOAFA168_201103, 1302_BIOAFA170_201103, 1302_BIOAFA171_201103, 1302_BIOAFA172_201103, 1302_BIOAFA173_201103, 1302_BIOAFA174_201103, 1302_BIOAFA175_201103	**03-Nov-2020**	**25-Nov-2020**	02-May-2021	✓	**25-Nov-2020**	04-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA176_201103, 1302_BIOAFA177_201103, 1302_QC122_201103, 1302_QC123_201103	**03-Nov-2020**	**26-Nov-2020**	02-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA178_201104, 1302_BIOAFA179_201104, 1302_BIOAFA180_201104, 1302_BIOAFA181_201104, 1302_BIOAFA182_201104, 1302_BIOAFA183_201104, 1302_BIOAFA184_201104, 1302_BIOAFA186_201104, 1302_BIOAFA187_201104, 1302_BIOAFA189_201104, 1302_BIOAFA190_201104, 1302_BIOAFA191_201104, 1302_BIOAFA192_201104, 1302_BIOAFA193_201104, 1302_BIOAFA194_201104, 1302_BIOAFA195_201104, 1302_QC126_201104, 1302_QC128_201104, 1302_QC129_201104	**04-Nov-2020**	**26-Nov-2020**	03-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA196_201107, 1302_BIOAFA197_201107	**07-Nov-2020**	**26-Nov-2020**	06-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA199_201108	**08-Nov-2020**	**26-Nov-2020**	07-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA201_201112, 1302_BIOAFA202_201112	**12-Nov-2020**	**26-Nov-2020**	11-May-2021	✓	**26-Nov-2020**	05-Jan-2021	✓

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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1302_QC121_201103, 1302_SW007_201103, 1302_SW009_201103	**03-Nov-2020**	**25-Nov-2020**	02-May-2021	✓	**25-Nov-2020**	02-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_SW008_201104	**04-Nov-2020**	**25-Nov-2020**	03-May-2021	✓	**25-Nov-2020**	03-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_QC302_201105	**05-Nov-2020**	**25-Nov-2020**	04-May-2021	✓	**25-Nov-2020**	04-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_QC502_201106	**06-Nov-2020**	**25-Nov-2020**	05-May-2021	✓	**25-Nov-2020**	05-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_SW010_201107, 1302_SW011_201107, 1302_SW012_201107	**07-Nov-2020**	**25-Nov-2020**	06-May-2021	✓	**25-Nov-2020**	06-May-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 1302_QC121_201103, 1302_SW007_201103, 1302_SW009_201103	**03-Nov-2020**	**25-Nov-2020**	02-May-2021	✓	**25-Nov-2020**	02-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_SW008_201104	**04-Nov-2020**	**25-Nov-2020**	03-May-2021	✓	**25-Nov-2020**	03-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_QC302_201105	**05-Nov-2020**	**25-Nov-2020**	04-May-2021	✓	**25-Nov-2020**	04-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_QC502_201106	**06-Nov-2020**	**25-Nov-2020**	05-May-2021	✓	**25-Nov-2020**	05-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_SW010_201107, 1302_SW011_201107, 1302_SW012_201107	**07-Nov-2020**	**25-Nov-2020**	06-May-2021	✓	**25-Nov-2020**	06-May-2021	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 1302_QC121_201103, 1302_SW007_201103, 1302_SW009_201103	**03-Nov-2020**	**25-Nov-2020**	02-May-2021	✓	**25-Nov-2020**	02-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_SW008_201104	**04-Nov-2020**	**25-Nov-2020**	03-May-2021	✓	**25-Nov-2020**	03-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_QC302_201105	**05-Nov-2020**	**25-Nov-2020**	04-May-2021	✓	**25-Nov-2020**	04-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_QC502_201106	**06-Nov-2020**	**25-Nov-2020**	05-May-2021	✓	**25-Nov-2020**	05-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_SW010_201107, 1302_SW011_201107, 1302_SW012_201107	**07-Nov-2020**	**25-Nov-2020**	06-May-2021	✓	**25-Nov-2020**	06-May-2021	✓

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) 1302_QC121_201103, 1302_SW007_201103, 1302_SW009_201103	**03-Nov-2020**	**25-Nov-2020**	02-May-2021	✓	**25-Nov-2020**	02-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_SW008_201104	**04-Nov-2020**	**25-Nov-2020**	03-May-2021	✓	**25-Nov-2020**	03-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_QC302_201105	**05-Nov-2020**	**25-Nov-2020**	04-May-2021	✓	**25-Nov-2020**	04-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_QC502_201106	**06-Nov-2020**	**25-Nov-2020**	05-May-2021	✓	**25-Nov-2020**	05-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_SW010_201107, 1302_SW011_201107, 1302_SW012_201107	**07-Nov-2020**	**25-Nov-2020**	06-May-2021	✓	**25-Nov-2020**	06-May-2021	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 1302_QC121_201103, 1302_SW007_201103, 1302_SW009_201103	**03-Nov-2020**	**25-Nov-2020**	02-May-2021	✓	**25-Nov-2020**	02-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_SW008_201104	**04-Nov-2020**	**25-Nov-2020**	03-May-2021	✓	**25-Nov-2020**	03-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_QC302_201105	**05-Nov-2020**	**25-Nov-2020**	04-May-2021	✓	**25-Nov-2020**	04-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_QC502_201106	**06-Nov-2020**	**25-Nov-2020**	05-May-2021	✓	**25-Nov-2020**	05-May-2021	✓
HDPE (no PTFE) (EP231X) 1302_SW010_201107, 1302_SW011_201107, 1302_SW012_201107	**07-Nov-2020**	**25-Nov-2020**	06-May-2021	✓	**25-Nov-2020**	06-May-2021	✓

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: **BIOTA**

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	5	48	**10.42**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	48	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	48	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	48	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	19	**0.00**	**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	0	19	**0.00**	**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
PFOS - Linear/Branched Speciation	EP231-PFOS-SP	BIOTA	In-house: Linear PFOS is determined by quantiation of the separate linear peak using linear PFOS. Branched PFOS is determined as the difference between total PFOS (determined using a mixed linear/branched standard) and linear PFOS.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	BIOTA	In-house: A sample extract is analysed 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 biota which is then solvent extracted. 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.
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
Prep-Preparation for Biota Analysis	* Biota-PP	BIOTA	A sample is prepared from whole or particular tissues/organs, identified, homogenised and the total weight of prepared sample recorded.
Sample Preparation for PFAS in Biota	EP231-PR	BIOTA	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of homogenised biota 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 conform to US DoD QSM 5.3, table B-15 requirements.
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 : **ES2040589**

Client	[redacted]
Contact	
Address	
E-mail	
Telephone	
Facsimile	
Project	
Order number	
C-O-C number	
Site	
Sampler	

Dates

Date Samples Received	: 17-Nov-2020 09:30	Issue Date	: 20-Nov-2020
Client Requested Due Date	: 11-Dec-2020	Scheduled Reporting Date	: **27-Nov-2020**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 5	Temperature	: 1.6' C SYD - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 67 / 57

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 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 absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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.

Method / Client sample ID	Sample Container Received	Preferred Sample Container for Analysis
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS : EP231X		
1302_BIOAFA154_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA155_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA156_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA157_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA158_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA159_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA160_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA161_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA162_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA164_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA165_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA166_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA167_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA168_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA170_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA171_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA172_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA173_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA174_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA175_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA176_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA177_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA178_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA179_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA180_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA181_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA182_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA183_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA184_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA186_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA187_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA189_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA190_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA191_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA192_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA193_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA194_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA195_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA196_201107	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA197_201107	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA199_201108	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA201_201112	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA202_201112	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC122_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC123_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC126_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC128_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC129_201104	- Snap Lock Bag - frozen	- Frozen Sample
PFOS - Linear/Branched Speciation : EP231-PFOS-SP		
1302_BIOAFA154_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA155_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA156_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA157_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA158_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA159_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA160_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA161_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA162_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA164_201103	- Snap Lock Bag - frozen	- Frozen Sample

Method *Client sample ID*	Sample Container Received	Preferred Sample Container for Analysis
PFOS - Linear/Branched Speciation : EP231-PFOS-SP		
1302_BIOAFA165_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA166_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA167_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA168_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA170_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA171_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA172_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA173_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA174_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA175_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA176_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA177_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA178_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA179_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA180_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA181_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA182_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA183_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA184_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA186_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA187_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA189_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA190_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA191_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA192_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA193_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA194_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA195_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA196_201107	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA197_201107	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA199_201108	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA201_201112	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA202_201112	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC122_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC123_201103	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC126_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC128_201104	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC129_201104	- Snap Lock Bag - frozen	- Frozen Sample

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

ES2040589-001	[03-Nov-2020]	1302_BIOAFA154_201103
ES2040589-002	[03-Nov-2020]	1302_BIOAFA155_201103
ES2040589-003	[03-Nov-2020]	1302_BIOAFA156_201103
ES2040589-004	[03-Nov-2020]	1302_BIOAFA157_201103
ES2040589-005	[03-Nov-2020]	1302_BIOAFA158_201103
ES2040589-006	[03-Nov-2020]	1302_BIOAFA159_201103
ES2040589-007	[03-Nov-2020]	1302_BIOAFA160_201103
ES2040589-008	[03-Nov-2020]	1302_BIOAFA161_201103
ES2040589-009	[03-Nov-2020]	1302_BIOAFA162_201103
ES2040589-010	[03-Nov-2020]	1302_BIOAFA163_201103
ES2040589-011	[03-Nov-2020]	1302_BIOAFA164_201103
ES2040589-012	[03-Nov-2020]	1302_BIOAFA165_201103
ES2040589-013	[03-Nov-2020]	1302_BIOAFA166_201103
ES2040589-014	[03-Nov-2020]	1302_BIOAFA167_201103
ES2040589-015	[03-Nov-2020]	1302_BIOAFA168_201103
ES2040589-016	[03-Nov-2020]	1302_BIOAFA169_201103
ES2040589-017	[03-Nov-2020]	1302_BIOAFA170_201103
ES2040589-018	[03-Nov-2020]	1302_BIOAFA171_201103
ES2040589-019	[03-Nov-2020]	1302_BIOAFA172_201103
ES2040589-020	[03-Nov-2020]	1302_BIOAFA173_201103

ES2040589-021	: [03-Nov-2020]	: 1302_BIOAFA174_201103
ES2040589-022	: [03-Nov-2020]	: 1302_BIOAFA175_201103
ES2040589-023	: [03-Nov-2020]	: 1302_BIOAFA176_201103
ES2040589-024	: [03-Nov-2020]	: 1302_BIOAFA177_201103
ES2040589-025	: [04-Nov-2020]	: 1302_BIOAFA178_201104
ES2040589-026	: [04-Nov-2020]	: 1302_BIOAFA179_201104
ES2040589-027	: [04-Nov-2020]	: 1302_BIOAFA180_201104
ES2040589-028	: [04-Nov-2020]	: 1302_BIOAFA181_201104
ES2040589-029	: [04-Nov-2020]	: 1302_BIOAFA182_201104
ES2040589-030	: [04-Nov-2020]	: 1302_BIOAFA183_201104
ES2040589-031	: [04-Nov-2020]	: 1302_BIOAFA184_201104
ES2040589-032	: [04-Nov-2020]	: 1302_BIOAFA185_201104
ES2040589-033	: [04-Nov-2020]	: 1302_BIOAFA186_201104
ES2040589-034	: [04-Nov-2020]	: 1302_BIOAFA187_201104
ES2040589-035	: [04-Nov-2020]	: 1302_BIOAFA188_201104
ES2040589-036	: [04-Nov-2020]	: 1302_BIOAFA189_201104
ES2040589-037	: [04-Nov-2020]	: 1302_BIOAFA190_201104
ES2040589-038	: [04-Nov-2020]	: 1302_BIOAFA191_201104
ES2040589-039	: [04-Nov-2020]	: 1302_BIOAFA192_201104
ES2040589-040	: [04-Nov-2020]	: 1302_BIOAFA193_201104
ES2040589-041	: [04-Nov-2020]	: 1302_BIOAFA194_201104
ES2040589-042	: [04-Nov-2020]	: 1302_BIOAFA195_201104
ES2040589-043	: [07-Nov-2020]	: 1302_BIOAFA196_201107
ES2040589-044	: [07-Nov-2020]	: 1302_BIOAFA197_201107
ES2040589-045	: [07-Nov-2020]	: 1302_BIOAFA198_201107
ES2040589-046	: [08-Nov-2020]	: 1302_BIOAFA199_201108
ES2040589-047	: [08-Nov-2020]	: 1302_BIOAFA200_201108
ES2040589-048	: [12-Nov-2020]	: 1302_BIOAFA201_201112
ES2040589-049	: [12-Nov-2020]	: 1302_BIOAFA202_201112
ES2040589-050	: [12-Nov-2020]	: 1302_BIOAFA203_201112

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: **BIOTA**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	(On Hold) BIOTA No analysis requested	BIOTA - EP231X PFAS - Full Suite (28 analytes) - includes PFOS
ES2040589-001	03-Nov-2020 00:00	1302_BIOAFA154_201103		✓
ES2040589-002	03-Nov-2020 00:00	1302_BIOAFA155_201103		✓
ES2040589-003	03-Nov-2020 00:00	1302_BIOAFA156_201103		✓
ES2040589-004	03-Nov-2020 00:00	1302_BIOAFA157_201103		✓
ES2040589-005	03-Nov-2020 00:00	1302_BIOAFA158_201103		✓
ES2040589-006	03-Nov-2020 00:00	1302_BIOAFA159_201103		✓
ES2040589-007	03-Nov-2020 00:00	1302_BIOAFA160_201103		✓
ES2040589-008	03-Nov-2020 00:00	1302_BIOAFA161_201103		✓
ES2040589-009	03-Nov-2020 00:00	1302_BIOAFA162_201103		✓
ES2040589-010	03-Nov-2020 00:00	1302_BIOAFA163_201103	✓	
ES2040589-011	03-Nov-2020 00:00	1302_BIOAFA164_201103		✓
ES2040589-012	03-Nov-2020 00:00	1302_BIOAFA165_201103		✓
ES2040589-013	03-Nov-2020 00:00	1302_BIOAFA166_201103		✓
ES2040589-014	03-Nov-2020 00:00	1302_BIOAFA167_201103		✓

			(On Hold) BIOTA No analysis requested	BIOTA - EP231X PFAS - Full Suite (28 analytes) - includes PFOS
ES2040589-015	03-Nov-2020 00:00	1302_BIOAFA168_201103		✓
ES2040589-016	03-Nov-2020 00:00	1302_BIOAFA169_201103	✓	
ES2040589-017	03-Nov-2020 00:00	1302_BIOAFA170_201103		✓
ES2040589-018	03-Nov-2020 00:00	1302_BIOAFA171_201103		✓
ES2040589-019	03-Nov-2020 00:00	1302_BIOAFA172_201103		✓
ES2040589-020	03-Nov-2020 00:00	1302_BIOAFA173_201103		✓
ES2040589-021	03-Nov-2020 00:00	1302_BIOAFA174_201103		✓
ES2040589-022	03-Nov-2020 00:00	1302_BIOAFA175_201103		✓
ES2040589-023	03-Nov-2020 00:00	1302_BIOAFA176_201103		✓
ES2040589-024	03-Nov-2020 00:00	1302_BIOAFA177_201103		✓
ES2040589-025	04-Nov-2020 00:00	1302_BIOAFA178_201104		✓
ES2040589-026	04-Nov-2020 00:00	1302_BIOAFA179_201104		✓
ES2040589-027	04-Nov-2020 00:00	1302_BIOAFA180_201104		✓
ES2040589-028	04-Nov-2020 00:00	1302_BIOAFA181_201104		✓
ES2040589-029	04-Nov-2020 00:00	1302_BIOAFA182_201104		✓
ES2040589-030	04-Nov-2020 00:00	1302_BIOAFA183_201104		✓
ES2040589-031	04-Nov-2020 00:00	1302_BIOAFA184_201104		✓
ES2040589-032	04-Nov-2020 00:00	1302_BIOAFA185_201104	✓	
ES2040589-033	04-Nov-2020 00:00	1302_BIOAFA186_201104		✓
ES2040589-034	04-Nov-2020 00:00	1302_BIOAFA187_201104		✓
ES2040589-035	04-Nov-2020 00:00	1302_BIOAFA188_201104	✓	
ES2040589-036	04-Nov-2020 00:00	1302_BIOAFA189_201104		✓
ES2040589-037	04-Nov-2020 00:00	1302_BIOAFA190_201104		✓
ES2040589-038	04-Nov-2020 00:00	1302_BIOAFA191_201104		✓
ES2040589-039	04-Nov-2020 00:00	1302_BIOAFA192_201104		✓
ES2040589-040	04-Nov-2020 00:00	1302_BIOAFA193_201104		✓
ES2040589-041	04-Nov-2020 00:00	1302_BIOAFA194_201104		✓
ES2040589-042	04-Nov-2020 00:00	1302_BIOAFA195_201104		✓
ES2040589-043	07-Nov-2020 00:00	1302_BIOAFA196_201107		✓
ES2040589-044	07-Nov-2020 00:00	1302_BIOAFA197_201107		✓
ES2040589-045	07-Nov-2020 00:00	1302_BIOAFA198_201107	✓	
ES2040589-046	08-Nov-2020 00:00	1302_BIOAFA199_201108		✓
ES2040589-047	08-Nov-2020 00:00	1302_BIOAFA200_201108	✓	
ES2040589-048	12-Nov-2020 00:00	1302_BIOAFA201_201112		✓
ES2040589-049	12-Nov-2020 00:00	1302_BIOAFA202_201112		✓
ES2040589-050	12-Nov-2020 00:00	1302_BIOAFA203_201112	✓	
ES2040589-052	03-Nov-2020 00:00	1302_QC122_201103		✓
ES2040589-053	03-Nov-2020 00:00	1302_QC123_201103		✓
ES2040589-054	03-Nov-2020 00:00	1302_QC124_201103	✓	
ES2040589-055	03-Nov-2020 00:00	1302_QC125_201103	✓	
ES2040589-056	04-Nov-2020 00:00	1302_QC126_201104		✓

			(On Hold) BIOTA No analysis requested	BIOTA - EP231X PFAS - Full Suite (28 analytes) - includes PFOS
ES2040589-057	04-Nov-2020 00:00	1302_QC127_201104	✓	
ES2040589-058	04-Nov-2020 00:00	1302_QC128_201104		✓
ES2040589-059	04-Nov-2020 00:00	1302_QC129_201104		✓

Matrix: **WATER**

Laboratory sample ID	*Client sampling date / time*	*Client sample ID*	WATER - EP231X PFAS - Full Suite (28 analytes)
ES2040589-051	03-Nov-2020 00:00	1302_QC121_201103	✓
ES2040589-060	05-Nov-2020 00:00	1302_QC302_201105	✓
ES2040589-061	06-Nov-2020 00:00	1302_QC502_201106	✓
ES2040589-062	03-Nov-2020 00:00	1302_SW007_201103	✓
ES2040589-063	04-Nov-2020 00:00	1302_SW008_201104	✓
ES2040589-064	03-Nov-2020 00:00	1302_SW009_201103	✓
ES2040589-065	07-Nov-2020 00:00	1302_SW010_201107	✓
ES2040589-066	07-Nov-2020 00:00	1302_SW011_201107	✓
ES2040589-067	07-Nov-2020 00:00	1302_SW012_201107	✓

Proactive Holding Time Report

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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	[redacted]
Client	
Contact	
Address	
Telephone	
Project	
Order number	
C-O-C number	
Sampler	
Site	
Quote number	
No. of samples receiv	
No. of samples analys	

ATA
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pliance with
025 - 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*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
	Senior Spectroscopist	Sydney Inorganics, 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 Contact 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.
- TDS by method EA-015 may bias high for sample 12 due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- 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: WATER (Matrix: WATER)			Sample ID	1302_SW112_201216	1302_SW113_201216	1302_SW125_201216	1302_SW120_201216	1302_SW124_201216
			Sampling date / time	16-Dec-2020 09:50	16-Dec-2020 10:05	16-Dec-2020 10:27	16-Dec-2020 10:45	16-Dec-2020 11:00
Compound	CAS Number	LOR	Unit	ES2045380-001	ES2045380-002	ES2045380-003	ES2045380-004	ES2045380-005
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	----	----	----	----	7.57
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	----	----	----	----	28200
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	----	----	----	----	44
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	----	----	----	----	130
Total Alkalinity as CaCO3	----	1	mg/L	----	----	----	----	130
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	----	----	----	----	2030
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	----	----	----	----	13600
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	----	----	----	----	318
Magnesium	7439-95-4	1	mg/L	----	----	----	----	865
Sodium	7440-23-5	1	mg/L	----	----	----	----	7220
Potassium	7440-09-7	1	mg/L	----	----	----	----	274
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	----	----	----	----	0.5
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	----	----	----	----	428
ø Total Cations	----	0.01	meq/L	----	----	----	----	408
ø Ionic Balance	----	0.01	%	----	----	----	----	2.44
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	----	----	----	----	2
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.04	<0.02	0.11	0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.03	<0.02	0.15	0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.33	0.09	1.39	0.23	0.03

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW112_201216	1302_SW113_201216	1302_SW125_201216	1302_SW120_201216	1302_SW124_201216
				Sampling date / time	16-Dec-2020 09:50	16-Dec-2020 10:05	16-Dec-2020 10:27	16-Dec-2020 10:45	16-Dec-2020 11:00
					ES2045380-001	ES2045380-002	ES2045380-003	ES2045380-004	ES2045380-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.02**	<0.02	**0.08**	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.63**	**0.13**	**2.82**	**0.35**	**0.06**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	**0.03**	<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	**0.06**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.08**	**0.02**	**0.22**	**0.04**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.03**	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.02**	<0.01	**0.06**	<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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW112_201216	1302_SW113_201216	1302_SW125_201216	1302_SW120_201216	1302_SW124_201216
				Sampling date / time	16-Dec-2020 09:50	16-Dec-2020 10:05	16-Dec-2020 10:27	16-Dec-2020 10:45	16-Dec-2020 11:00
Compound	CAS Number	LOR	Unit		ES2045380-001	ES2045380-002	ES2045380-003	ES2045380-004	ES2045380-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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		**1.15**	**0.24**	**4.95**	**0.66**	**0.09**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.96**	**0.22**	**4.21**	**0.58**	**0.09**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.10**	**0.24**	**4.69**	**0.64**	**0.09**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**95.1**	**105**	**100**	**101**
13C8-PFOA	----	0.02	%		**101**	**103**	**101**	**101**	**103**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	1302_SW114_201216	1302_SW104_201216	1302_SW115_201216	1302_SW106_201216	1302_SW108_201216
			Sampling date / time	16-Dec-2020 12:15	16-Dec-2020 14:00	16-Dec-2020 14:15	16-Dec-2020 14:30	16-Dec-2020 14:50
Compound	CAS Number	LOR	Unit	ES2045380-006	ES2045380-007	ES2045380-008	ES2045380-009	ES2045380-010
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	7.23	----	6.57	----	----
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	----	----	<10	----	----
Total Dissolved Solids @180°C	----	10	mg/L	37	----	----	----	----
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	18	----	9	----	----
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	28	----	2	----	----
Total Alkalinity as CaCO3	----	1	mg/L	28	----	2	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	----	<1	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	4	----	<1	----	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	5	----	1	----	----
Magnesium	7439-95-4	1	mg/L	1	----	<1	----	----
Sodium	7440-23-5	1	mg/L	5	----	1	----	----
Potassium	7440-09-7	1	mg/L	1	----	<1	----	----
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	0.1	----	<0.1	----	----
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	0.67	----	0.04	----	----
ø Total Cations	----	0.01	meq/L	0.57	----	0.09	----	----
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	2	----	<1	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	<0.02	0.03	0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	<0.02	0.03	0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	<0.02	0.28	0.20

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW114_201216	1302_SW104_201216	1302_SW115_201216	1302_SW106_201216	1302_SW108_201216
				Sampling date / time	16-Dec-2020 12:15	16-Dec-2020 14:00	16-Dec-2020 14:15	16-Dec-2020 14:30	16-Dec-2020 14:50
					ES2045380-006	ES2045380-007	ES2045380-008	ES2045380-009	ES2045380-010
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
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	**0.02**	<0.01	**0.52**	**0.35**
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	**0.07**	**0.04**
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW114_201216	1302_SW104_201216	1302_SW115_201216	1302_SW106_201216	1302_SW108_201216
				Sampling date / time	16-Dec-2020 12:15	16-Dec-2020 14:00	16-Dec-2020 14:15	16-Dec-2020 14:30	16-Dec-2020 14:50
Compound	CAS Number	LOR	Unit		ES2045380-006	ES2045380-007	ES2045380-008	ES2045380-009	ES2045380-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	**0.02**	<0.01	**0.94**	**0.63**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.02**	<0.01	**0.80**	**0.55**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.02**	<0.01	**0.91**	**0.61**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**110**	**104**	**104**	**101**
13C8-PFOA	----	0.02	%		**103**	**103**	**102**	**98.8**	**99.8**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	1302_SW109_201216	1302_SW168_201216	1302_SW132_201217	1302_SW133_201217	1302_SW143_201217
			Sampling date / time	16-Dec-2020 15:55	16-Dec-2020 16:20	17-Dec-2020 10:20	17-Dec-2020 10:50	17-Dec-2020 11:05
Compound	CAS Number	LOR	Unit	ES2045380-011	ES2045380-012	ES2045380-013	ES2045380-014	ES2045380-015
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	----	5.99	----	7.15	8.08
EA015: Total Dissolved Solids dried at 180 ± 5 °C								
Total Dissolved Solids @180°C	----	10	mg/L	----	33	----	173	----
Total Dissolved Solids @180°C	----	10	mg/L	----	----	----	----	10000
EA025: Total Suspended Solids dried at 104 ± 2°C								
Suspended Solids (SS)	----	5	mg/L	----	23	----	15	30
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	----	8	----	16	93
Total Alkalinity as CaCO3	----	1	mg/L	----	8	----	16	93
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	----	<1	----	19	645
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	----	2	----	71	5100
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	----	1	----	28	121
Magnesium	7439-95-4	1	mg/L	----	<1	----	<1	310
Sodium	7440-23-5	1	mg/L	----	1	----	15	2610
Potassium	7440-09-7	1	mg/L	----	<1	----	16	97
EK040P: Fluoride by PC Titrator								
Fluoride	16984-48-8	0.1	mg/L	----	<0.1	----	0.1	0.4
EN055: Ionic Balance								
ø Total Anions	----	0.01	meq/L	----	0.22	----	2.72	159
ø Total Cations	----	0.01	meq/L	----	0.09	----	2.46	148
ø Ionic Balance	----	0.01	%	----	----	----	----	3.78
EP002: Dissolved Organic Carbon (DOC)								
Dissolved Organic Carbon	----	1	mg/L	----	4	----	2	<1
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW109_201216	1302_SW168_201216	1302_SW132_201217	1302_SW133_201217	1302_SW143_201217
				Sampling date / time	16-Dec-2020 15:55	16-Dec-2020 16:20	17-Dec-2020 10:20	17-Dec-2020 10:50	17-Dec-2020 11:05
Compound	CAS Number	LOR	Unit		ES2045380-011	ES2045380-012	ES2045380-013	ES2045380-014	ES2045380-015
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**0.18**	**0.07**	**0.04**	**0.05**	**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		**0.31**	**0.27**	**0.07**	**0.05**	**0.23**
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	**0.05**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.04**	<0.02	<0.02	**0.04**	**0.03**
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW109_201216	1302_SW168_201216	1302_SW132_201217	1302_SW133_201217	1302_SW143_201217
				Sampling date / time	16-Dec-2020 15:55	16-Dec-2020 16:20	17-Dec-2020 10:20	17-Dec-2020 10:50	17-Dec-2020 11:05
Compound	CAS Number	LOR	Unit		ES2045380-011	ES2045380-012	ES2045380-013	ES2045380-014	ES2045380-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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		**0.53**	**0.34**	**0.11**	**0.22**	**0.40**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.49**	**0.34**	**0.11**	**0.10**	**0.37**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.53**	**0.34**	**0.11**	**0.22**	**0.40**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**97.1**	**103**	**107**	**98.9**
13C8-PFOA	----	0.02	%		**103**	**101**	**104**	**103**	**103**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC100_201216	1302_QC300_201216	1302_QC400_201216	1302_QC500_201216	1302_QC101_201216
				Sampling date / time	16-Dec-2020 00:00	16-Dec-2020 00:00	16-Dec-2020 00:00	16-Dec-2020 00:00	16-Dec-2020 00:00
Compound	CAS Number	LOR	Unit		ES2045380-016	ES2045380-017	ES2045380-018	ES2045380-019	ES2045380-020
					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	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.16**
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	**0.28**
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	**0.04**
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: WATER (Matrix: WATER)				Sample ID	1302_QC100_201216	1302_QC300_201216	1302_QC400_201216	1302_QC500_201216	1302_QC101_201216
				Sampling date / time	16-Dec-2020 00:00	16-Dec-2020 00:00	16-Dec-2020 00:00	16-Dec-2020 00:00	16-Dec-2020 00:00
Compound	CAS Number	LOR	Unit		ES2045380-016	ES2045380-017	ES2045380-018	ES2045380-019	ES2045380-020
					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	**0.49**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.44**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.49**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.1**	**93.7**	**97.0**	**97.7**	**96.3**
13C8-PFOA	----	0.02	%		**100**	**98.7**	**90.2**	**102**	**102**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_QC301_201217 Received as QC302	1302_QC401_201217 Received as QC402	1302_QC501_201217 Received as QC502	----	----
				Sampling date / time	17-Dec-2020 00:00	17-Dec-2020 00:00	17-Dec-2020 00:00	----	----
					ES2045380-021	ES2045380-022	ES2045380-023	--------	--------
					Result	Result	Result	----	----
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	0.02	µg/L		<0.02	<0.02	<0.02	----	----
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	----	----
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	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC301_201217 Received as QC302	1302_QC401_201217 Received as QC402	1302_QC501_201217 Received as QC502	----	----
				Sampling date / time	17-Dec-2020 00:00	17-Dec-2020 00:00	17-Dec-2020 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2045380-021	ES2045380-022	ES2045380-023	--------	--------
					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	----	----
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	----	----
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	%		**99.8**	**93.0**	**103**	----	----
13C8-PFOA	----	0.02	%		**104**	**104**	**105**	----	----

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	[redacted]
Client	
Contact	
Address	
Telephone	
Project	
Order number	
C-O-C number	
Sampler	
Site	
Quote number	
No. of samples received	
No. of samples analysed	

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*
[redacted]	Organic Chemist	Sydney Organics, Smithfield, NSW
	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
	Senior Spectroscopist	Sydney Inorganics, 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

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 (%)	Recovery Limits (%)
EA005P: pH by PC Titrator (QC Lot: 3436708)									
ES2045273-003	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.96	7.96	0.00	0% - 20%
ES2044937-007	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	8.21	8.20	0.122	0% - 20%
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QC Lot: 3436977)									
ES2045380-005	1302_SW124_201216	EA015H: Total Dissolved Solids @180°C	----	10	mg/L	28200	29100	3.04	0% - 20%
EA025: Total Suspended Solids dried at 104 ± 2°C (QC Lot: 3436978)									
ES2045380-005	1302_SW124_201216	EA025H: Suspended Solids (SS)	----	5	mg/L	44	60	31.9	0% - 50%
ED037P: Alkalinity by PC Titrator (QC Lot: 3436709)									
ES2045273-003	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	8760	8800	0.471	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	8760	8800	0.471	0% - 20%
ES2044937-007	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	6440	6500	1.02	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	6440	6500	0.978	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3439486)									
ES2044940-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.00	No Limit
ES2045381-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 3439487)									
ES2044940-004	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1	2	0.00	No Limit
ES2045381-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	7	8	0.00	No Limit
ED093F: Dissolved Major Cations (QC Lot: 3436159)									
ES2044661-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	8	7	0.00	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	3	3	0.00	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 (%)	Recovery Limits (%)
ED093F: Dissolved Major Cations (QC Lot: 3436159) - continued									
ES2044661-001	Anonymous	ED093F: Sodium	7440-23-5	1	mg/L	1400	1390	1.11	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	11	10	13.0	0% - 50%
ES2044982-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	16	16	0.00	0% - 50%
		ED093F: Magnesium	7439-95-4	1	mg/L	6	6	0.00	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	16	16	0.00	0% - 50%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.00	No Limit
ED093F: Dissolved Major Cations (QC Lot: 3443332)									
ES2045380-008	1302_SW115_201216	ED093F: Calcium	7440-70-2	1	mg/L	1	1	0.00	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.00	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	1	1	0.00	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.00	No Limit
ES2045406-003	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	2	2	0.00	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	<1	<1	0.00	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	<1	<1	0.00	No Limit
		ED093F: Potassium	7440-09-7	1	mg/L	<1	<1	0.00	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 3436710)									
ES2045273-003	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	1.2	1.1	0.00	0% - 50%
ES2044937-007	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.9	0.9	0.00	No Limit
EP002: Dissolved Organic Carbon (DOC) (QC Lot: 3441245)									
ES2044940-004	Anonymous	EP002: Dissolved Organic Carbon	----	1	mg/L	4	4	0.00	No Limit
ES2045382-002	Anonymous	EP002: Dissolved Organic Carbon	----	1	mg/L	<1	<1	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3441850)									
ES2044940-008	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.16	0.15	0.00	0% - 50%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3441850)									
ES2044940-008	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	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 (%)*	*Recovery Limits (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3441850) - continued									
ES2044940-008	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3441850)									
ES2044940-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3441850)									
ES2044940-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 3441850)									
ES2044940-008	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.16	0.15	6.45	0% - 50%

Method Blank (MB) and Laboratory Control Spike (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 Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 3436708)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98.8	101
				----	7 pH Unit	100	99.2	101
EA015: Total Dissolved Solids dried at 180 ± 5 °C (QCLot: 3436977)								
EA015H: Total Dissolved Solids @180°C	----	10	mg/L	<10	2000 mg/L	95.6	87.0	109
				<10	293 mg/L	106	66.0	126
EA025: Total Suspended Solids dried at 104 ± 2°C (QCLot: 3436978)								
EA025H: Suspended Solids (SS)	----	5	mg/L	<5	150 mg/L	102	83.0	129
				<5	1000 mg/L	96.2	82.0	110
ED037P: Alkalinity by PC Titrator (QCLot: 3436709)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	110	81.0	111
				----	50 mg/L	120	80.0	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3439486)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.1	82.0	122
				<1	500 mg/L	93.5	82.0	122
ED045G: Chloride by Discrete Analyser (QCLot: 3439487)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	50 mg/L	107	80.9	127
				<1	1000 mg/L	104	80.9	127
ED093F: Dissolved Major Cations (QCLot: 3436159)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	111	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	101	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	99.8	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	96.6	85.0	113
ED093F: Dissolved Major Cations (QCLot: 3443332)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	50 mg/L	93.9	80.0	114
ED093F: Magnesium	7439-95-4	1	mg/L	<1	50 mg/L	98.2	90.0	116
ED093F: Sodium	7440-23-5	1	mg/L	<1	50 mg/L	96.4	82.0	120
ED093F: Potassium	7440-09-7	1	mg/L	<1	50 mg/L	94.0	85.0	113
EK040P: Fluoride by PC Titrator (QCLot: 3436710)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	106	82.0	116
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3441245)								
EP002: Dissolved Organic Carbon	----	1	mg/L	<1	10 mg/L	93.4	71.0	121
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3440799)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	77.4	72.0	130

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3440799) - continued								
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	81.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	75.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	83.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	78.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	124	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3441850)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	107	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	0.02	µg/L	<0.02	0.25 µg/L	100	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	106	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	112	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3440799)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	75.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	83.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	76.4	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	85.0	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	84.6	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	92.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	93.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.6	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	93.4	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3441850)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	76.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	78.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	118	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	126	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	112	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	118	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	108	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3440799)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	74.8	67.0	137

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report		
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3440799) - continued								
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	75.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	88.7	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	85.4	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	79.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	90.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	85.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3441850)								
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	114	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	110	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	120	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	96.3	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	121	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3440799)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	83.6	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	107	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	116	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	73.8	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3441850)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	80.4	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	100	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	97.8	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	99.4	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(%)	Recovery Limits (%)

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Recovery Limits (%) Low	Matrix Spike (MS) Report: Recovery Limits (%) High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3439486)							
ES2044940-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	10 mg/L	120	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 3439487)							
ES2044940-004	Anonymous	ED045G: Chloride	16887-00-6	50 mg/L	106	70.0	130
EK040P: Fluoride by PC Titrator (QCLot: 3436710)							
ES2044940-004	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	105	70.0	130
EP002: Dissolved Organic Carbon (DOC) (QCLot: 3441245)							
ES2044940-005	Anonymous	EP002: Dissolved Organic Carbon	----	100 mg/L	104	70.0	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3441850)							
ES2044940-008	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	112	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	93.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	96.6	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	106	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	108	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3441850)							
ES2044940-008	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	74.0	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	73.0	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	114	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	98.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	126	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	105	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	100	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	128	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	93.4	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3441850)							
ES2044940-008	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	99.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	101	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	112	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	114	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	91.7	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	125	65.0	136

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3441850) - continued							
ES2044940-008	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	116	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3441850)							
ES2044940-008	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	70.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	86.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	95.2	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	85.6	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	[redacted]
Client	
Contact	
Project	
Site	
Sampler	
Order number	

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

- **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 : 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
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural							
1302_SW124_201216,	1302_SW114_201216,	----	----	----	22-Dec-2020	16-Dec-2020	**6**
1302_SW115_201216,	1302_SW168_201216						
Clear Plastic Bottle - Natural							
1302_SW133_201217,	1302_SW143_201217	----	----	----	22-Dec-2020	17-Dec-2020	**5**
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural							
1302_SW115_201216,	1302_SW168_201216	----	----	----	30-Dec-2020	23-Dec-2020	**7**
Clear Plastic Bottle - Natural							
1302_SW133_201217,	1302_SW143_201217	----	----	----	30-Dec-2020	24-Dec-2020	**6**

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	1	37	2.70	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	37	2.70	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 / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural (EA005-P)								
1302_SW124_201216,	1302_SW114_201216,	**16-Dec-2020**	**----**	----	----	**22-Dec-2020**	16-Dec-2020	×
1302_SW115_201216,	1302_SW168_201216							
Clear Plastic Bottle - Natural (EA005-P)								
1302_SW133_201217,	1302_SW143_201217	**17-Dec-2020**	**----**	----	----	**22-Dec-2020**	17-Dec-2020	×

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
EA015: Total Dissolved Solids dried at 180 ± 5 °C							
Clear Plastic Bottle - Natural (EA015H)							
1302_SW124_201216, 1302_SW114_201216, 1302_SW115_201216, 1302_SW168_201216	**16-Dec-2020**	**----**	----	----	**22-Dec-2020**	23-Dec-2020	✓
Clear Plastic Bottle - Natural (EA015H)							
1302_SW133_201217, 1302_SW143_201217	**17-Dec-2020**	**----**	----	----	**22-Dec-2020**	24-Dec-2020	✓
EA025: Total Suspended Solids dried at 104 ± 2°C							
Clear Plastic Bottle - Natural (EA025H)							
1302_SW124_201216, 1302_SW114_201216, 1302_SW115_201216, 1302_SW168_201216	**16-Dec-2020**	**----**	----	----	**22-Dec-2020**	23-Dec-2020	✓
Clear Plastic Bottle - Natural (EA025H)							
1302_SW133_201217, 1302_SW143_201217	**17-Dec-2020**	**----**	----	----	**22-Dec-2020**	24-Dec-2020	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P)							
1302_SW124_201216, 1302_SW114_201216, 1302_SW115_201216, 1302_SW168_201216	**16-Dec-2020**	**----**	----	----	**22-Dec-2020**	30-Dec-2020	✓
Clear Plastic Bottle - Natural (ED037-P)							
1302_SW133_201217, 1302_SW143_201217	**17-Dec-2020**	**----**	----	----	**22-Dec-2020**	31-Dec-2020	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G)							
1302_SW124_201216, 1302_SW114_201216, 1302_SW115_201216, 1302_SW168_201216	**16-Dec-2020**	**----**	----	----	**24-Dec-2020**	13-Jan-2021	✓
Clear Plastic Bottle - Natural (ED041G)							
1302_SW133_201217, 1302_SW143_201217	**17-Dec-2020**	**----**	----	----	**24-Dec-2020**	14-Jan-2021	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
1302_SW124_201216, 1302_SW114_201216, 1302_SW115_201216, 1302_SW168_201216	**16-Dec-2020**	**----**	----	----	**24-Dec-2020**	13-Jan-2021	✓
Clear Plastic Bottle - Natural (ED045G)							
1302_SW133_201217, 1302_SW143_201217	**17-Dec-2020**	**----**	----	----	**24-Dec-2020**	14-Jan-2021	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F)							
1302_SW124_201216, 1302_SW114_201216	**16-Dec-2020**	**----**	----	----	**22-Dec-2020**	23-Dec-2020	✓
Clear Plastic Bottle - Natural (ED093F)							
1302_SW115_201216, 1302_SW168_201216	**16-Dec-2020**	**----**	----	----	**30-Dec-2020**	23-Dec-2020	×
Clear Plastic Bottle - Natural (ED093F)							
1302_SW133_201217, 1302_SW143_201217	**17-Dec-2020**	**----**	----	----	**30-Dec-2020**	24-Dec-2020	×
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P)							
1302_SW124_201216, 1302_SW114_201216, 1302_SW115_201216, 1302_SW168_201216	**16-Dec-2020**	**----**	----	----	**22-Dec-2020**	13-Jan-2021	✓
Clear Plastic Bottle - Natural (EK040P)							
1302_SW133_201217, 1302_SW143_201217	**17-Dec-2020**	**----**	----	----	**22-Dec-2020**	14-Jan-2021	✓

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
EP002: Dissolved Organic Carbon (DOC)							
Amber DOC Filtered- Sulfuric Preserved (EP002)							
1302_SW124_201216, 1302_SW114_201216, 1302_SW115_201216, 1302_SW168_201216	**16-Dec-2020**	**----**	----	----	**26-Dec-2020**	13-Jan-2021	✓
Amber DOC Filtered- Sulfuric Preserved (EP002)							
1302_SW133_201217, 1302_SW143_201217	**17-Dec-2020**	**----**	----	----	**26-Dec-2020**	14-Jan-2021	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW112_201216, 1302_SW113_201216, 1302_SW125_201216, 1302_SW120_201216, 1302_SW124_201216, 1302_SW114_201216, 1302_SW104_201216, 1302_SW115_201216, 1302_SW106_201216, 1302_SW108_201216, 1302_SW109_201216, 1302_SW168_201216, 1302_QC100_201216, 1302_QC300_201216, 1302_QC400_201216, 1302_QC500_201216, 1302_QC101_201216	**16-Dec-2020**	**29-Dec-2020**	14-Jun-2021	✓	**29-Dec-2020**	14-Jun-2021	✓
HDPE (no PTFE) (EP231X)							
1302_SW132_201217, 1302_SW133_201217, 1302_SW143_201217, 1302_QC301_201217 - Received as QC302, 1302_QC401_201217 - Received as QC402, 1302_QC501_201217 - Received as QC502	**17-Dec-2020**	**29-Dec-2020**	15-Jun-2021	✓	**29-Dec-2020**	15-Jun-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW112_201216, 1302_SW113_201216, 1302_SW125_201216, 1302_SW120_201216, 1302_SW124_201216, 1302_SW114_201216, 1302_SW104_201216, 1302_SW115_201216, 1302_SW106_201216, 1302_SW108_201216, 1302_SW109_201216, 1302_SW168_201216, 1302_QC100_201216, 1302_QC300_201216, 1302_QC400_201216, 1302_QC500_201216, 1302_QC101_201216	**16-Dec-2020**	**29-Dec-2020**	14-Jun-2021	✓	**29-Dec-2020**	14-Jun-2021	✓
HDPE (no PTFE) (EP231X)							
1302_SW132_201217, 1302_SW133_201217, 1302_SW143_201217, 1302_QC301_201217 - Received as QC302, 1302_QC401_201217 - Received as QC402, 1302_QC501_201217 - Received as QC502	**17-Dec-2020**	**29-Dec-2020**	15-Jun-2021	✓	**29-Dec-2020**	15-Jun-2021	✓

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)							
1302_SW112_201216, 1302_SW113_201216, 1302_SW125_201216, 1302_SW120_201216, 1302_SW124_201216, 1302_SW114_201216, 1302_SW104_201216, 1302_SW115_201216, 1302_SW106_201216, 1302_SW108_201216, 1302_SW109_201216, 1302_SW168_201216, 1302_QC100_201216, 1302_QC300_201216, 1302_QC400_201216, 1302_QC500_201216, 1302_QC101_201216	**16-Dec-2020**	**29-Dec-2020**	14-Jun-2021	✓	**29-Dec-2020**	14-Jun-2021	✓
HDPE (no PTFE) (EP231X)							
1302_SW132_201217, 1302_SW133_201217, 1302_SW143_201217, 1302_QC301_201217 - Received as QC302, 1302_QC401_201217 - Received as QC402, 1302_QC501_201217 - Received as QC502	**17-Dec-2020**	**29-Dec-2020**	15-Jun-2021	✓	**29-Dec-2020**	15-Jun-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW112_201216, 1302_SW113_201216, 1302_SW125_201216, 1302_SW120_201216, 1302_SW124_201216, 1302_SW114_201216, 1302_SW104_201216, 1302_SW115_201216, 1302_SW106_201216, 1302_SW108_201216, 1302_SW109_201216, 1302_SW168_201216, 1302_QC100_201216, 1302_QC300_201216, 1302_QC400_201216, 1302_QC500_201216, 1302_QC101_201216	**16-Dec-2020**	**29-Dec-2020**	14-Jun-2021	✓	**29-Dec-2020**	14-Jun-2021	✓
HDPE (no PTFE) (EP231X)							
1302_SW132_201217, 1302_SW133_201217, 1302_SW143_201217, 1302_QC301_201217 - Received as QC302, 1302_QC401_201217 - Received as QC402, 1302_QC501_201217 - Received as QC502	**17-Dec-2020**	**29-Dec-2020**	15-Jun-2021	✓	**29-Dec-2020**	15-Jun-2021	✓

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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_SW112_201216, 1302_SW113_201216, 1302_SW125_201216, 1302_SW120_201216, 1302_SW124_201216, 1302_SW114_201216, 1302_SW104_201216, 1302_SW115_201216, 1302_SW106_201216, 1302_SW108_201216, 1302_SW109_201216, 1302_SW168_201216, 1302_QC100_201216, 1302_QC300_201216, 1302_QC400_201216, 1302_QC500_201216, 1302_QC101_201216	**16-Dec-2020**	**29-Dec-2020**	14-Jun-2021	✓	**29-Dec-2020**	14-Jun-2021	✓
HDPE (no PTFE) (EP231X)							
1302_SW132_201217, 1302_SW133_201217, 1302_SW143_201217, 1302_QC301_201217 - Received as QC302, 1302_QC401_201217 - Received as QC402, 1302_QC501_201217 - Received as QC502	**17-Dec-2020**	**29-Dec-2020**	15-Jun-2021	✓	**29-Dec-2020**	15-Jun-2021	✓

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 PC Titrator	ED037-P	2	19	**10.53**	**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
Dissolved Organic Carbon	EP002	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	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	1	37	**2.70**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	16	**12.50**	**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
Suspended Solids (High Level)	EA025H	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	2	19	**10.53**	**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
Dissolved Organic Carbon	EP002	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	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	37	**5.41**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	16	**12.50**	**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
Suspended Solids (High Level)	EA025H	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	2	10	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Chloride by Discrete Analyser	ED045G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Organic Carbon	EP002	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	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	37	**5.41**	**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
Suspended Solids (High Level)	EA025H	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Dissolved Solids (High Level)	EA015H	1	10	**10.00**	**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
Dissolved Organic Carbon	EP002	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	37	**2.70**	**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
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM Schedule B(3)
Total Dissolved Solids (High Level)	EA015H	WATER	In house: Referenced to APHA 2540C. A gravimetric procedure that determines the amount of `filterable` residue in an aqueous sample. A well-mixed sample is filtered through a glass fibre filter (1.2um). The filtrate is evaporated to dryness and dried to constant weight at 180+/-5C. This method is compliant with NEPM Schedule B(3)
Suspended Solids (High Level)	EA025H	WATER	In house: Referenced to APHA 2540D. A gravimetric procedure employed to determine the amount of `non-filterable` residue in a aqueous sample. The prescribed GFC (1.2um) filter is rinsed with deionised water, oven dried and weighed prior to analysis. A well-mixed sample is filtered through a glass fibre filter (1.2um). The residue on the filter paper is dried at 104+/-2C . This method is compliant with NEPM Schedule B(3)
Alkalinity by PC 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 librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
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)
Fluoride by PC Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. 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)
Dissolved Organic Carbon	EP002	WATER	In house: Referenced to APHA 5310 B. This method is compliant with NEPM Schedule B(3). Samples are combusted at high termperature in the presence of an oxidative catalyst. The evolved carbon dioxide is quantified using an IR detector.

Analytical Methods	Method	Matrix	Method Descriptions
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	[redacted]
Client	
Contact	
Address	
E-mail	
Telephone	
Facsimile	
Project	
Order number	
C-O-C number	
Site	
Sampler	

Dates

Date Samples Received	: 22-Dec-2020 07:30	Issue Date	: 22-Dec-2020
Client Requested Due Date	: 05-Jan-2021	Scheduled Reporting Date	: **05-Jan-2021**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: 17.6' C
Receipt Detail	:	No. of samples received / analysed	: 23 / 23

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
- **Samples 1302_QC200_201216 and 1302_QC201_201216 forwarded to NMI as per COC.**
- **Sample #24, #25 were not received.**
- **Sample 1302_QC202_201218 was not received.**
- **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 absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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.

ES2045380-021 : [17-Dec-2020] : 1302_QC301_201217 - Received as QC302
ES2045380-022 : [17-Dec-2020] : 1302_QC401_201217 - Received as QC402
ES2045380-023 : [17-Dec-2020] : 1302_QC501_201217 - Received as QC502

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 - EA005P pH (PCT)	WATER - EA015H Total Dissolved Solids - Standard Level	WATER - EA025H Suspended Solids - Standard Level	WATER - EN055 - PG Ionic Balance by ED037P, ED041G, ED045G &	WATER - EP002 Dissolved Organic Carbon (DOC)	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - NT-01 & 02A Ca, Mg, Na, K, Cl, SO4, Alkalinity & Fluoride
ES2045380-001	16-Dec-2020 09:50	1302_SW112_201216						✓	
ES2045380-002	16-Dec-2020 10:05	1302_SW113_201216						✓	
ES2045380-003	16-Dec-2020 10:27	1302_SW125_201216						✓	
ES2045380-004	16-Dec-2020 10:45	1302_SW120_201216						✓	
ES2045380-005	16-Dec-2020 11:00	1302_SW124_201216	✓	✓	✓	✓	✓	✓	✓
ES2045380-006	16-Dec-2020 12:15	1302_SW114_201216	✓	✓	✓	✓	✓	✓	✓
ES2045380-007	16-Dec-2020 14:00	1302_SW104_201216						✓	
ES2045380-008	16-Dec-2020 14:15	1302_SW115_201216	✓	✓	✓	✓	✓	✓	✓
ES2045380-009	16-Dec-2020 14:30	1302_SW106_201216						✓	
ES2045380-010	16-Dec-2020 14:50	1302_SW108_201216						✓	
ES2045380-011	16-Dec-2020 15:55	1302_SW109_201216						✓	
ES2045380-012	16-Dec-2020 16:20	1302_SW168_201216	✓	✓	✓	✓	✓	✓	✓
ES2045380-013	17-Dec-2020 10:20	1302_SW132_201217						✓	
ES2045380-014	17-Dec-2020 10:50	1302_SW133_201217	✓	✓	✓	✓	✓	✓	✓
ES2045380-015	17-Dec-2020 11:05	1302_SW143_201217	✓	✓	✓	✓	✓	✓	✓
ES2045380-016	16-Dec-2020 00:00	1302_QC100_201216						✓	
ES2045380-017	16-Dec-2020 00:00	1302_QC300_201216						✓	
ES2045380-018	16-Dec-2020 00:00	1302_QC400_201216						✓	
ES2045380-019	16-Dec-2020 00:00	1302_QC500_201216						✓	
ES2045380-020	16-Dec-2020 00:00	1302_QC101_201216						✓	
ES2045380-021	17-Dec-2020 00:00	1302_QC301_201217 R...						✓	
ES2045380-022	17-Dec-2020 00:00	1302_QC401_201217 R...						✓	
ES2045380-023	17-Dec-2020 00:00	1302_QC501_201217 R...						✓	

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

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

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EA005-P: pH by PC Titrator							
1302_SW114_20121	Clear Plastic Bottle - Natural	----	16-Dec-2020	22-Dec-2020	×	----	----

1302_SW115_20121	Clear Plastic Bottle - Natural	----	16-Dec-2020	22-Dec-2020	✘	----	----
1302_SW124_20121	Clear Plastic Bottle - Natural	----	16-Dec-2020	22-Dec-2020	✘	----	----
1302_SW133_20121	Clear Plastic Bottle - Natural	----	17-Dec-2020	22-Dec-2020	✘	----	----
1302_SW143_20121	Clear Plastic Bottle - Natural	----	17-Dec-2020	22-Dec-2020	✘	----	----
1302_SW168_20121	Clear Plastic Bottle - Natural	----	16-Dec-2020	22-Dec-2020	✘	----	----

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV) Email

AP CORP

- A4 - AU Tax Invoice (INV) Email

[redacted]

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

[redacted]

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

DERP ESDAT REPORTS

- EDI Format - ESDAT (ESDAT) Email

[redacted]

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

[redacted]

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	[redacted]
Client	
Contact	
Address	
E-mail	
Telephone	
Facsimile	
Project	
Order number	
C-O-C number	
Site	
Sampler	

Dates

Date Samples Received	: 14-Jan-2021 09:10	Issue Date	: 14-Jan-2021
Client Requested Due Date	: 21-Jan-2021	Scheduled Reporting Date	: **21-Jan-2021**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: 4.7'C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

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 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 absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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)
ES2101132-001	18-Dec-2020 00:00	SW162	✓
ES2101132-002	18-Dec-2020 00:00	SW181	✓
ES2101132-003	18-Dec-2020 00:00	QC102	✓
ES2101132-004	18-Dec-2020 00:00	QC202	✓
ES2101132-005	02-Nov-2020 00:00	QC300	✓
ES2101132-006	02-Nov-2020 00:00	QC400	✓

Proactive Holding Time Report

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

[redacted]

ALS Environmental

[redacted]

Work Order	
Amendment	
Client	
Contact	
Address	
Telephone	
Project	
Order number	
C-O-C number	
Sampler	
Site	
Quote number	
No. of samples received	
No. of samples analysed	

ATA
ation No. 825
pliance with
025 - 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*
[redacted]	Organic Chemist	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 Contact 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.
- Amendment (28/01/2021): This report has been amended to alter the project reference and order number. All analysis results are as per the previous report.
- 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: WATER (Matrix: WATER)				Sample ID	SW162	SW181	QC102	QC202	QC300
				Sampling date / time	18-Dec-2020 00:00	18-Dec-2020 00:00	18-Dec-2020 00:00	18-Dec-2020 00:00	02-Nov-2020 00:00
Compound	CAS Number	LOR	Unit		ES2101132-001	ES2101132-002	ES2101132-003	ES2101132-004	ES2101132-005
					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	0.02	µg/L		<0.02	**0.03**	**0.03**	**0.03**	<0.02
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**	**0.35**	**0.34**	**0.35**	<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	**0.03**	**0.03**	<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: WATER (Matrix: WATER)				Sample ID	SW162	SW181	QC102	QC202	QC300
				Sampling date / time	18-Dec-2020 00:00	18-Dec-2020 00:00	18-Dec-2020 00:00	18-Dec-2020 00:00	02-Nov-2020 00:00
Compound	CAS Number	LOR	Unit		ES2101132-001	ES2101132-002	ES2101132-003	ES2101132-004	ES2101132-005
					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	**0.09**	**0.07**	**0.07**	<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		**0.05**	**0.47**	**0.47**	**0.48**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.05**	**0.38**	**0.37**	**0.38**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.05**	**0.47**	**0.47**	**0.48**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**118**	**116**	**119**	**115**	**119**
13C8-PFOA	----	0.02	%		**70.1**	**72.5**	**73.1**	**67.8**	**70.6**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC400	----	----	----	----
				Sampling date / time	02-Nov-2020 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2101132-006	--------	--------	--------	--------
					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	0.02	µg/L		<0.02	----	----	----	----
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: WATER (Matrix: WATER)				Sample ID	QC400	----	----	----	----
				Sampling date / time	02-Nov-2020 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2101132-006	--------	--------	--------	--------
					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	%		**120**	----	----	----	----
13C8-PFOA	----	0.02	%		**67.9**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

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

ALS Environmental

QUALITY CONTROL REPORT

[redacted]

Work Order	
Amendment	
Client	
Contact	
Address	
Telephone	
Project	
Order number	
C-O-C number	
Sampler	
Site	
Quote number	
No. of samples received	
No. of samples analysed	

NATA

editation No. 825
ompliance with
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*
[redacted]	Organic Chemist	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

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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

Method Blank (MB) and Laboratory Control Spike (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 Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3463669)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	94.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	110	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	115	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	116	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	101	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	104	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3463669)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	85.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	113	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	111	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	101	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	109	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	105	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	97.7	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3463669)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	83.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	113	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	92.7	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	93.3	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	84.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	96.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3463669)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	98.8	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	94.6	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

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3463669) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	100	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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

[redacted]

Work Order

Amendment

Client
Contact
Project
Site
Sampler
Order number

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

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

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	0	11	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	11	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: Date extracted	Due for extraction	Evaluation	Analysis: Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) QC300, QC400	**02-Nov-2020**	**18-Jan-2021**	01-May-2021	✓	**18-Jan-2021**	01-May-2021	✓
HDPE (no PTFE) (EP231X) SW162, SW181, QC102, QC202	**18-Dec-2020**	**18-Jan-2021**	16-Jun-2021	✓	**18-Jan-2021**	16-Jun-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) QC300, QC400	**02-Nov-2020**	**18-Jan-2021**	01-May-2021	✓	**18-Jan-2021**	01-May-2021	✓
HDPE (no PTFE) (EP231X) SW162, SW181, QC102, QC202	**18-Dec-2020**	**18-Jan-2021**	16-Jun-2021	✓	**18-Jan-2021**	16-Jun-2021	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) QC300, QC400	**02-Nov-2020**	**18-Jan-2021**	01-May-2021	✓	**18-Jan-2021**	01-May-2021	✓
HDPE (no PTFE) (EP231X) SW162, SW181, QC102, QC202	**18-Dec-2020**	**18-Jan-2021**	16-Jun-2021	✓	**18-Jan-2021**	16-Jun-2021	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) QC300, QC400	**02-Nov-2020**	**18-Jan-2021**	01-May-2021	✓	**18-Jan-2021**	01-May-2021	✓
HDPE (no PTFE) (EP231X) SW162, SW181, QC102, QC202	**18-Dec-2020**	**18-Jan-2021**	16-Jun-2021	✓	**18-Jan-2021**	16-Jun-2021	✓

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
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
QC300,	QC400	**02-Nov-2020**	**18-Jan-2021**	01-May-2021	✓	**18-Jan-2021**	01-May-2021	✓
HDPE (no PTFE) (EP231X)								
SW162,	SW181,	**18-Dec-2020**	**18-Jan-2021**	16-Jun-2021	✓	**18-Jan-2021**	16-Jun-2021	✓
QC102,	QC202							

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	11	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	11	**0.00**	**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
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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	[redacted]
Amendment	
Client	
Contact	
Address	
Telephone	
Project	
Order number	
C-O-C number	
Sampler	
Site	
Quote number	
No. of samples received	
No. of samples analysed	

NATA
Accreditation No. 825
Compliance with
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*
[redacted]	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 Contact 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.
- Amendment (08/02/2021): This report has been amended as a result of a request to change sample dates. All analysis results are as per the previous report.
- 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	1302_SW162_210120	1302_SW150_210119	1302_SW188_210119	1302_SW170_210119	1302_SW181_210120
				Sampling date / time	20-Jan-2021 00:00	19-Jan-2021 00:00	19-Jan-2021 00:00	19-Jan-2021 00:00	20-Jan-2021 00:00
Compound	CAS Number	LOR	Unit		ES2102255-001	ES2102255-002	ES2102255-003	ES2102255-004	ES2102255-005
					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	0.02	µg/L		<0.02	**0.09**	**0.03**	**0.09**	<0.02
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		**0.04**	**0.42**	**0.07**	**0.24**	**0.19**
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	**0.03**	<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: SURFACE WATER (Matrix: WATER)				Sample ID	1302_SW162_210120	1302_SW150_210119	1302_SW188_210119	1302_SW170_210119	1302_SW181_210120
				Sampling date / time	20-Jan-2021 00:00	19-Jan-2021 00:00	19-Jan-2021 00:00	19-Jan-2021 00:00	20-Jan-2021 00:00
Compound	CAS Number	LOR	Unit		ES2102255-001	ES2102255-002	ES2102255-003	ES2102255-004	ES2102255-005
					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		**0.04**	**0.56**	**0.10**	**0.33**	**0.19**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.04**	**0.51**	**0.10**	**0.33**	**0.19**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.04**	**0.56**	**0.10**	**0.33**	**0.19**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**88.7**	**99.9**	**110**	**111**
13C8-PFOA	----	0.02	%		**106**	**81.0**	**100**	**105**	**104**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW178_210120	1302_QC100_210119	1302_QC300_210119	1302_QC400_210119	1203_QC500_210119
				Sampling date / time	20-Jan-2021 00:00	19-Jan-2021 00:00	19-Jan-2021 00:00	19-Jan-2021 00:00	19-Jan-2021 00:00
Compound	CAS Number	LOR	Unit		ES2102255-006	ES2102255-007	ES2102255-009	ES2102255-010	ES2102255-011
					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	0.02	µg/L		<0.02	**0.11**	<0.02	<0.02	<0.02
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**	**0.25**	<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: WATER (Matrix: WATER)				Sample ID	1302_SW178_210120	1302_QC100_210119	1302_QC300_210119	1302_QC400_210119	1203_QC500_210119
				Sampling date / time	20-Jan-2021 00:00	19-Jan-2021 00:00	19-Jan-2021 00:00	19-Jan-2021 00:00	19-Jan-2021 00:00
Compound	CAS Number	LOR	Unit		ES2102255-006	ES2102255-007	ES2102255-009	ES2102255-010	ES2102255-011
					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**	**0.36**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.01**	**0.36**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.01**	**0.36**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**112**	**104**	**105**	**102**	**104**
13C8-PFOA	----	0.02	%		**113**	**105**	**101**	**101**	**107**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC301_210120	1302_QC401_210120	1302_QC501_210120	----	----
				Sampling date / time	20-Jan-2021 00:00	20-Jan-2021 00:00	20-Jan-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2102255-012	ES2102255-013	ES2102255-014	--------	--------
					Result	Result	Result	----	----
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	0.02	µg/L		<0.02	<0.02	<0.02	----	----
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	----	----
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	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC301_210120	1302_QC401_210120	1302_QC501_210120	----	----
				Sampling date / time	20-Jan-2021 00:00	20-Jan-2021 00:00	20-Jan-2021 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2102255-012	ES2102255-013	ES2102255-014	--------	--------
					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	----	----
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	----	----
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	%		**105**	**107**	**108**	----	----
13C8-PFOA	----	0.02	%		**102**	**104**	**102**	----	----

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

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	[redacted]
Amendment	
Client	
Contact	
Address	
Telephone	
Project	
Order number	
C-O-C number	
Sampler	
Site	
Quote number	
No. of samples received	
No. of samples analysed	

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*
[redacted]	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

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 (%)*	*Recovery Limits (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3479995)									
ES2102256-001	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
ES2102256-002	Anonymous	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3479995)									
ES2102256-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
ES2102256-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.00	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 (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 3479995) - continued									
ES2102256-002	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 3479995)									
ES2102256-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ES2102256-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3479995)									
ES2102256-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	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 (%)*	*Recovery Limits (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3479995) - continued									
ES2102256-001	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
ES2102256-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 3479995)									
ES2102256-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit
ES2102256-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3479995)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	94.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	98.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	118	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	103	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	114	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3479995)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	93.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	105	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	106	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	109	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	130	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	108	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3479995)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	109	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	124	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	89.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	87.8	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	90.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	121	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3479995)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	102	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	115	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	Recovery Limits (%): Low	Recovery Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3479995) - continued								
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	Recovery Limits (%): Low	Recovery Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3479995)							
ES2102256-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	102	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	99.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	127	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	111	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	118	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3479995)							
ES2102256-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.0	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	106	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	110	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	113	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	113	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	126	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	119	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	127	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	110	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3479995)							
ES2102256-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	116	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	130	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	99.2	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	108	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	93.2	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	107	65.0	136

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3479995) - continued							
ES2102256-001	Anonymous	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: 3479995)							
ES2102256-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	96.0	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	118	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	101	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	90.0	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

[redacted]

Work Order

Amendment

Client
Contact
Project
Site
Sampler
Order number

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: **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)								
1302_SW150_210119,	1302_SW188_210119,	**19-Jan-2021**	**28-Jan-2021**	18-Jul-2021	✓	**28-Jan-2021**	18-Jul-2021	✓
1302_SW170_210119,	1302_QC100_210119,							
1302_QC300_210119,	1302_QC400_210119,							
1203_QC500_210119								
HDPE (no PTFE) (EP231X)								
1302_SW162_210120,	1302_SW181_210120,	**20-Jan-2021**	**28-Jan-2021**	19-Jul-2021	✓	**28-Jan-2021**	19-Jul-2021	✓
1302_SW178_210120,	1302_QC301_210120,							
1302_QC401_210120,	1302_QC501_210120							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
1302_SW150_210119,	1302_SW188_210119,	**19-Jan-2021**	**28-Jan-2021**	18-Jul-2021	✓	**28-Jan-2021**	18-Jul-2021	✓
1302_SW170_210119,	1302_QC100_210119,							
1302_QC300_210119,	1302_QC400_210119,							
1203_QC500_210119								
HDPE (no PTFE) (EP231X)								
1302_SW162_210120,	1302_SW181_210120,	**20-Jan-2021**	**28-Jan-2021**	19-Jul-2021	✓	**28-Jan-2021**	19-Jul-2021	✓
1302_SW178_210120,	1302_QC301_210120,							
1302_QC401_210120,	1302_QC501_210120							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
1302_SW150_210119,	1302_SW188_210119,	**19-Jan-2021**	**28-Jan-2021**	18-Jul-2021	✓	**28-Jan-2021**	18-Jul-2021	✓
1302_SW170_210119,	1302_QC100_210119,							
1302_QC300_210119,	1302_QC400_210119,							
1203_QC500_210119								
HDPE (no PTFE) (EP231X)								
1302_SW162_210120,	1302_SW181_210120,	**20-Jan-2021**	**28-Jan-2021**	19-Jul-2021	✓	**28-Jan-2021**	19-Jul-2021	✓
1302_SW178_210120,	1302_QC301_210120,							
1302_QC401_210120,	1302_QC501_210120							

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)								
1302_SW150_210119,	1302_SW188_210119,	**19-Jan-2021**	**28-Jan-2021**	18-Jul-2021	✓	**28-Jan-2021**	18-Jul-2021	✓
1302_SW170_210119,	1302_QC100_210119,							
1302_QC300_210119,	1302_QC400_210119,							
1203_QC500_210119								
HDPE (no PTFE) (EP231X)								
1302_SW162_210120,	1302_SW181_210120,	**20-Jan-2021**	**28-Jan-2021**	19-Jul-2021	✓	**28-Jan-2021**	19-Jul-2021	✓
1302_SW178_210120,	1302_QC301_210120,							
1302_QC401_210120,	1302_QC501_210120							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
1302_SW150_210119,	1302_SW188_210119,	**19-Jan-2021**	**28-Jan-2021**	18-Jul-2021	✓	**28-Jan-2021**	18-Jul-2021	✓
1302_SW170_210119,	1302_QC100_210119,							
1302_QC300_210119,	1302_QC400_210119,							
1203_QC500_210119								
HDPE (no PTFE) (EP231X)								
1302_SW162_210120,	1302_SW181_210120,	**20-Jan-2021**	**28-Jan-2021**	19-Jul-2021	✓	**28-Jan-2021**	19-Jul-2021	✓
1302_SW178_210120,	1302_QC301_210120,							
1302_QC401_210120,	1302_QC501_210120							

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)							
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
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.

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	[redacted]
Amendment	
Client	
Contact	
Address	
E-mail	
Telephone	
Facsimile	
Project	
Order number	
C-O-C number	
Site	
Sampler	

Dates

Date Samples Received	: 22-Jan-2021 14:05	Issue Date	: 08-Feb-2021
Client Requested Due Date	: 01-Feb-2021	Scheduled Reporting Date	: **01-Feb-2021**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: 10.2' C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 13 / 13

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
- This is an updated SRN which indicates change of sampling dates.
- **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 absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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)
ES2102255-001	20-Jan-2021 00:00	1302_SW162_210120	✓
ES2102255-002	19-Jan-2021 00:00	1302_SW150_210119	✓
ES2102255-003	19-Jan-2021 00:00	1302_SW188_210119	✓
ES2102255-004	19-Jan-2021 00:00	1302_SW170_210119	✓
ES2102255-005	20-Jan-2021 00:00	1302_SW181_210120	✓
ES2102255-006	20-Jan-2021 00:00	1302_SW178_210120	✓
ES2102255-007	19-Jan-2021 00:00	1302_QC100_210119	✓
ES2102255-009	19-Jan-2021 00:00	1302_QC300_210119	✓
ES2102255-010	19-Jan-2021 00:00	1302_QC400_210119	✓
ES2102255-011	19-Jan-2021 00:00	1203_QC500_210119	✓
ES2102255-012	20-Jan-2021 00:00	1302_QC301_210120	✓
ES2102255-013	20-Jan-2021 00:00	1302_QC401_210120	✓
ES2102255-014	20-Jan-2021 00:00	1302_QC501_210120	✓

Proactive Holding Time Report

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

REPORT OF ANALYSIS

Client	: [redacted]	**Job No.**	: AECO06/201109/1
		Quote No.	: QT-02018
		Order No.	: 60612561_4_1
		Date Received	: 09-NOV-2020
Attention	: [redacted]	**Sampled By**	: CLIENT
Project Name	: 1302_NT_PFASOMP		
Your Client Services Manager	: [redacted]	**Phone**	[redacted]

Lab Reg No.	Sample Ref	Sample Description
N20/026407	1302_QC200_201102	WATER 02/11/2020 10:41 AM
N20/026408	1302_QC201_201102	WATER 02/11/2020 04:40 PM
N20/026409	1302_QC202_201103	WATER 03/11/2020 10:19 AM
N20/026410	1302_QC203_201103	WATER 03/11/2020 04:09 PM

Lab Reg No.		N20/026407	N20/026408	N20/026409	N20/026410	
Date Sampled		02-NOV-2020	02-NOV-2020	03-NOV-2020	03-NOV-2020	
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05	0.088	0.091	1.0	NR70
PFPeA (2706-90-3)	ug/L	<0.02	0.15	0.13	1.3	NR70
PFHxA (307-24-4)	ug/L	<0.01	0.64	0.75	6.1	NR70
PFHpA (375-85-9)	ug/L	<0.01	0.10	0.085	0.84	NR70
PFOA (335-67-1)	ug/L	<0.01	0.19	0.17	1.8	NR70
PFNA (375-95-1)	ug/L	<0.01	<0.01	<0.01	0.011	NR70
PFDA (335-76-2)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
PFUdA (2058-94-8)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
PFDoA (307-55-1)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
PFTrDA (72629-94-8)	ug/L	<0.02	<0.02	<0.02	<0.02	NR70
PFTeDA (376-06-7)	ug/L	<0.02	<0.02	<0.02	<0.02	NR70
PFHxDA (67905-19-5)	ug/L	<0.02	<0.02	<0.02	<0.02	NR70
PFODA (16517-11-6)	ug/L	<0.05	<0.05	<0.05	<0.05	NR70
FOUEA (70887-84-2)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
PFDS (335-77-3)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
PFPeS (2706-91-4)	ug/L	<0.01	0.36	0.30	3.2	NR70
PFHxS (355-46-4)	ug/L	0.044	3.1	2.5	25	NR70
PFHpS (375-92-8)	ug/L	<0.01	0.18	0.16	1.8	NR70
PFOS (1763-23-1)	ug/L	0.17	4.3	8.0	31	NR70
PFNS (68259-12-1)	ug/L	<0.01	<0.01	0.011	<0.01	NR70
PFBS (375-73-5)	ug/L	<0.01	0.33	0.33	3.3	NR70
PFOSA (754-91-6)	ug/L	<0.01	<0.01	<0.01	0.014	NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02	<0.02	<0.02	<0.02	NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02	<0.02	<0.02	<0.02	NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05	<0.05	<0.05	<0.05	NR70

REPORT OF ANALYSIS

Report No. RN1294219

Lab Reg No.		N20/026407	N20/026408	N20/026409	N20/026410	
Date Sampled		02-NOV-2020	02-NOV-2020	03-NOV-2020	03-NOV-2020	
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05	<0.05	<0.05	NR70
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
6:2 FTS (27619-97-2)	ug/L	<0.01	<0.01	<0.01	0.071	NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01	<0.01	0.018	NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02	<0.02	<0.02	NR70
PFBA (Surrogate Recovery)	%	91	91	104	95	NR70
PFPeA (Surrogate Recovery)	%	89	81	86	87	NR70
PFHxA (Surrogate Recovery)	%	84	84	78	76	NR70
PFHpA (Surrogate Recovery)	%	85	83	84	96	NR70
PFOA (Surrogate Recovery)	%	84	86	94	101	NR70
PFNA (Surrogate Recovery)	%	81	86	107	90	NR70
PFDA (Surrogate Recovery)	%	76	85	96	94	NR70
PFUdA (Surrogate Recovery)	%	91	81	103	107	NR70
PFDoA (Surrogate Recovery)	%	80	82	92	96	NR70
PFTeDA (Surrogate Recovery)	%	78	81	98	90	NR70
PFHxDA (Surrogate Recovery)	%	100	89	101	99	NR70
FOUEA (Surrogate Recovery)	%	75	84	84	101	NR70
PFBS (Surrogate Recovery)	%	94	88	87	100	NR70
PFHxS (Surrogate Recovery)	%	88	78	83	77	NR70
PFOS (Surrogate Recovery)	%	99	81	80	100	NR70
PFOSA (Surrogate Recovery)	%	82	78	87	101	NR70
N-MeFOSA (Surrogate Recovery)	%	64	63	81	89	NR70
N-EtFOSA (Surrogate Recovery)	%	61	72	68	80	NR70
N-MeFOSAA (Surrogate Recovery)	%	74	85	73	107	NR70
N-EtFOSAA (Surrogate Recovery)	%	79	79	110	114	NR70
N-MeFOSE (Surrogate Recovery)	%	99	87	74	116	NR70
N-EtFOSE (Surrogate Recovery)	%	73	70	67	131	NR70
4:2 FTS (Surrogate Recovery)	%	72	62	69	97	NR70
6:2 FTS (Surrogate Recovery)	%	68	69	75	81	NR70
8:2 FTS (Surrogate Recovery)	%	74	69	80	81	NR70
8:2 diPAP (Surrogate Recovery)	%	55	79	51	50	NR70
Dates						
Date extracted		13-NOV-2020	13-NOV-2020	13-NOV-2020	13-NOV-2020	
Date analysed		13-NOV-2020	13-NOV-2020	13-NOV-2020	13-NOV-2020	

N20/026407
to
N20/026410

[redacted]

REPORT OF ANALYSIS

PFOS and PFHxS are quantified using a combined branched and linear standard,
linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.
Selected PFAS surrogate recoveries are biased due to matrix effects.ô

[redacted]

[redacted]
Organics - NSW
Accreditation No. 198

17-NOV-2020

NATA
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TECHNICAL
COMPETENCE

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

Measurement Uncertainty is available upon request.
Chemical Accreditation 198: 105 Delhi Road, North Ryde, NSW, 2113

NR70 PFAS in Waters; Standard LOR

Enter Test Code (optional)

Extraction Data

Sample Number	WRB	WLCS	N20/026407	N20/026408	N20/026408	N20/026409	N20/026409	N20/026410	N20/026410
Sample + bottle + cap Mass (g)	67.37	64.27	43.96	41.52	41.52	41.08	41.08	40.96	40.96
Empty bottle + cap Mass (g)	13.53	13.58	13.63	13.54	13.54	13.51	13.51	13.61	13.61
Final Volume (mL)	1	1	1	1	1	1	1	1	1
Extract Dilution Factor	1	1	1	1	20	1	20	1	20
Date Extracted	13/11/20	13/11/20	13/11/20	13/11/20	13/11/20	13/11/20	13/11/20	13/11/20	13/11/20
Date Analysed	13/11/20	13/11/20	13/11/20	13/11/20	13/11/20	13/11/20	13/11/20	13/11/20	13/11/20
Instrument Data (ug/L)									
PFBA	0.12	2.64	0.05	2.45	0.02#	2.51	0.15#	27.93	0.91#
PFPeA	0.05	2.52	0.06	4.21	0.19#	3.54	0.2#	35.66	1.55#
PFHxA	0.05	2.39	0.12	17.77	0.7#	20.55	0.86#	192.39#	8.4
PFHpA	0.03	2.48	0.03	2.9	0.13#	2.33	0.11#	23.05	0.99#
PFOA		2.31	0	5.34	0.15#	4.65	0.16#	48.5	2.15#
PFNA	0.05	2.36	0.04	0.11	0.05#	0.16	0.06#	0.3	0.05#
PFDA		2.34			#		#		#
PFUdA	0	2.6	0.01	0.01	0.01#	0.01	0.01#	0.01	0.01#
PFDoA	0.05	2.65	0.05	0.05	0.05#	0.05	0.05#	0.05	0.05#
PFTrDA	0.01	2.58	0.06	0	0.01#	0	0.06#	0	0.02#
PFTeDA		2.69			#		#		#
PFHxDA		2.45			#		#		#
PFODA		2.64			#		#		#
FOUEA		2.49	0.02		#		#		#
PFBS		2.44	0.08	10.56	0.39#	10.37	0.42#	122.85#	5.15
PFPeS	0.03	2.4	0.11	10.75	0.51#	8.72	0.36#	102.93#	4.65
PFHxS Linear		2.52	1.59	124.93#	4.72	85.68#	3.85	870.33#	38.5
PFHxS Branched		2.33	0.86	120#	5.06	75.6#	3.48	1044.61#	35.12
PFHpS	0.01	2.51	0.12	5.44	0.19#	4.75	0.22#	52.46	1.79#
PFOS Linear	0.19	2.52	5.48	143.19#	5.43	262.17#	10.93	816.91#	33.77
PFOS Branched	0.18	2.49	5.98	308.5#	10.7	425.51#	15.6	2825.78#	93.8
PFNS	0.05	2.42	0.06	0.1	0.05#	0.31	0.06#	0.21	0.06#
PFDS	0.07	2.45	0.07	0.07	0.07#	0.07	0.07#	0.08	0.07#
FOSA-I		2.9			#	0.09	#	0.38	#
N-MeFOSA-M	0.07	2.79	0.1	0.09	0.08#	0.1	0.1#	0.09	0.07#
N-EtFOSA-M		2.59			#		#		#
N-MeFOSAA		3.02			#		#		#
N-EtFOSAA		2.51			#		#		#
N-MeFOSE-M	0.24	2.89	0.23	0.24	0.25#	0.26	0.24#	0.26	0.24#
N-EtFOSE-M		2.13	0.04	0.03	0.03#	0.01	0.01#	0	0.02#
4:2 FTS	0.04	2.59	0.03	0.04	0.04#	0.03	0.03#	0.03	0.04#
6:2 FTS		2.38			#		#	2.03	#
8:2 FTS		2.95			#	0.06	#	0.5	#
10:2 FTS		2.66			#		#		#
8:2 diPAP	0.04	3.05	0.07	0.04	0.04#	0.04	0.04#	0.04	0.04#
MPFBA	4.85	4.66	4.53	4.57	5.21	5.18	4.67	4.77	4.69
M5PFPeA	4.7	4.3	4.46	4.04	4.96	4.31	4.4	4.33	4.55
M5PFHxA	4.55	4.21	4.18	4.2	5.01	3.88	4.47	3.8	4.38
M4PFHpA	4.7	4.18	4.23	4.15	5.04	4.19	4.7	4.81	4.97
M8PFOA	4.51	4.43	4.18	4.29	4.78	4.71	4.69	5.06	4.82
M9PFNA	3.72	4.25	4.05	4.28	4.52	5.33	4.68	4.52	4.64
M6PFDA	3.34	3.98	3.78	4.24	4.51	4.78	4.81	4.68	4.61
M7PFUdA	3.67	3.61	4.56	4.05	4.61	5.16	4.87	5.37	4.8
MPFDoA	3.11	3.53	4	4.11	4.36	4.58	4.36	4.82	3.88
M2PFTeDA	3.2	3.57	3.9	4.07	4.84	4.92	4.68	4.51	4.26
M2PFHxDA	4.47	4.6	5.01	4.47	5.04	5.03	4.72	4.93	4.89
MFOUEA	4.09	3.92	3.73	4.2	4.77	4.22	4.44	5.06	4.4
M3PFBS	4.81	4.5	4.7	4.42	4.95	4.36	4.96	5.02	4.81
M3PFHxS	4.69	4.38	4.38	3.89	5.13	4.17	4.59	3.87	4.63
M8PFOS	4.29	4.32	4.97	4.05	4.19	4.02	4.72	4.99	4.44
M8FOSA-I	3.35	3.39	4.11	3.88	4.59	4.34	4.66	5.04	4.57
d-N-MeFOSA-M	2.65	3.21	3.22	3.13	4.25	4.04	3.96	4.47	4.27
d-N-EtFOSA-M	3.49	3.54	3.04	3.62	3.79	3.38	4.35	4	4.16
d3-N-MeFOSAA	3.74	3	3.69	4.26	4.38	3.67	4.74	5.36	4.03
d5-N-EtFOSAA	3.75	3.64	3.94	3.93	4.42	5.49	4.43	5.68	4.79
d7-N-MeFOSE-M	3.53	3.29	4.93	4.37	4.41	3.71	4.83	5.82	5.72
d9-N-EtFOSE-M	4.79	4.98	3.67	3.49	7.69#	3.37	5.69	6.57	5.74
M2-4:2 FTS	3.44	3.28	3.62	3.09	4.25	3.46	4.35	4.87	4.57
M2-6:2 FTS	3.69	3.6	3.38	3.47	4.05	3.75	4.02	4.05	4.34
M2-8:2 FTS	2.91	3.33	3.69	3.47	4.39	3.98	4.08	4.03	3.95
M4-8:2 diPAP	3.01	2.19	2.76	2.15#	3.95	2.39#	2.56	2.5	2.59

Results

		WRB	WLCS	N20/026407	N20/026408	N20/026408	N20/026409	N20/026409	N20/026410	N20/026410
PFBA (375-22-4)	ug/L	<0.05	0.052	<0.05	0.088		0.091		1.0	
PFPeA (2706-90-3)	ug/L	<0.02	0.050	<0.02	0.15		0.13		1.3	
PFHxA (307-24-4)	ug/L	<0.01	0.047	<0.01	0.64		0.75			6.1
PFHpA (375-85-9)	ug/L	<0.01	0.049	<0.01	0.10		0.085		0.84	
PFOA (335-67-1)	ug/L	<0.01	0.046	<0.01	0.19		0.17		1.8	
PFNA (375-95-1)	ug/L	<0.01	0.047	<0.01	<0.01		<0.01		0.011	
PFDA (335-76-2)	ug/L	<0.01	0.046	<0.01	<0.01		<0.01		<0.01	
PFUdA (2058-94-8)	ug/L	<0.01	0.051	<0.01	<0.01		<0.01		<0.01	
PFDoA (307-55-1)	ug/L	<0.01	0.052	<0.01	<0.01		<0.01		<0.01	
PFTrDA (72629-94-8)	ug/L	<0.02	0.051	<0.02	<0.02		<0.02		<0.02	
PFTeDA (376-06-7)	ug/L	<0.02	0.053	<0.02	<0.02		<0.02		<0.02	
PFHxDA (67905-19-5)	ug/L	<0.02	0.048	<0.02	<0.02		<0.02		<0.02	
PFODA (16517-11-6)	ug/L	<0.05	0.052	<0.05	<0.05		<0.05		<0.05	
FOUEA (70887-84-2)	ug/L	<0.01	0.049	<0.01	<0.01		<0.01		<0.01	
PFBS (375-73-5)	ug/L	<0.01	0.043	<0.01	0.33		0.33			3.3
PFPeS (2706-91-4)	ug/L	<0.01	0.045	<0.01	0.36		0.30			3.2
PFHxS (355-46-4)	ug/L	<0.01	0.045	0.044		3.1		2.5		25
PFHpS (375-92-8)	ug/L	<0.01	0.047	<0.01	0.18		0.16		1.8	
PFOS (1763-23-1)	ug/L	<0.02	0.046	0.17		4.3		8.0		31
PFNS (68259-12-1)	ug/L	<0.01	0.046	<0.01	<0.01		0.011		<0.01	
PFDS (335-77-3)	ug/L	<0.01	0.047	<0.01	<0.01		<0.01		<0.01	
PFOSA (754-91-6)	ug/L	<0.01	0.057	<0.01	<0.01		<0.01		0.014	
N-MeFOSA (31506-32-8)	ug/L	<0.02	0.055	<0.02	<0.02		<0.02		<0.02	
N-EtFOSA (4151-50-2)	ug/L	<0.02	0.051	<0.02	<0.02		<0.02		<0.02	
N-MeFOSAA (2355-31-9)	ug/L	<0.01	0.060	<0.01	<0.01		<0.01		<0.01	
N-EtFOSAA(2991-50-6)	ug/L	<0.01	0.050	<0.01	<0.01		<0.01		<0.01	
N-MeFOSE (24448-09-7)	ug/L	<0.05	0.057	<0.05	<0.05		<0.05		<0.05	
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05	<0.05	<0.05		<0.05		<0.05	
4:2 FTS (757124-72-4)	ug/L	<0.01	0.048	<0.01	<0.01		<0.01		<0.01	
6:2 FTS (27619-97-2)	ug/L	<0.01	0.045	<0.01	<0.01		<0.01		0.071	
8:2 FTS (39108-34-4)	ug/L	<0.01	0.056	<0.01	<0.01		<0.01		0.018	
10:2 FTS (120226-60-0)	ug/L	<0.01	0.051	<0.01	<0.01		<0.01		<0.01	
8:2 diPAP (678-41-1)	ug/L	<0.02	0.059	<0.02	<0.02		<0.02		<0.02	
PFBA (Surrogate Recovery)	%	97	93	91	91	104	104	93	95	94
PFPeA (Surrogate Recovery)	%	94	86	89	81	99	86	88	87	91
PFHxA (Surrogate Recovery)	%	91	84	84	84	100	78	89	76	88
PFHpA (Surrogate Recovery)	%	94	84	85	83	101	84	94	96	99
PFOA (Surrogate Recovery)	%	90	89	84	86	96	94	94	101	96
PFNA (Surrogate Recovery)	%	74	85	81	86	90	107	94	90	93
PFDA (Surrogate Recovery)	%	67	80	76	85	90	96	96	94	92
PFUdA (Surrogate Recovery)	%	73	72	91	81	92	103	97	107	96
PFDoA (Surrogate Recovery)	%	62	71	80	82	87	92	87	96	78
PFTeDA (Surrogate Recovery)	%	64	71	78	81	97	98	94	90	85
PFHxDA (Surrogate Recovery)	%	89	92	100	89	101	101	94	99	98
FOUEA (Surrogate Recovery)	%	82	78	75	84	95	84	89	101	88
PFBS (Surrogate Recovery)	%	96	90	94	88	99	87	99	100	96
PFHxS (Surrogate Recovery)	%	94	88	88	78	103	83	92	77	93
PFOS (Surrogate Recovery)	%	86	86	99	81	84	80	94	100	89
PFOSA (Surrogate Recovery)	%	67	68	82	78	92	87	93	101	91
N-MeFOSA (Surrogate Recovery)	%	53	64	64	63	85	81	79	89	85
N-EtFOSA (Surrogate Recovery)	%	70	71	61	72	76	68	87	80	83

Australian Government
National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/201109/1 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	106	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	101	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	96	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	99	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	92	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	94	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	94	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	104	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	106	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	103	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	108	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	98	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	106	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	100	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	98	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	96	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	101	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	100	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	101	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	97	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	98	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	116	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	112	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	104	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	121	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	100	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	116	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	85	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	104	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	95	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	118	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	106	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	122	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference.

Signed: [redacted]

Organics Manager, NMI-North Ryde

Date: **16/11/2020**

Australian Government
Department of Industry, Science, Energy and Resources

National Measurement Institute

SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [redacted]

Customer:

Address:

Email:

Telephone:

Fax:

LABORATORY DETAILS

Lab: National Measurement Institute

Contact: [redacted]

Address:

Email:

Telephone:

Fax:

SAMPLE DETAILS

NMI Job Name: AECO06/201109/1

Total No. of Samples: 4

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N20/026407	17-NOV-2020	1302_QC200_201102	WATER 02/11/2020 10:41 AM
N20/026408	17-NOV-2020	1302_QC201_201102	WATER 02/11/2020 04:40 PM
N20/026409	17-NOV-2020	1302_QC202_201103	WATER 03/11/2020 10:19 AM
N20/026410	17-NOV-2020	1302_QC203_201103	WATER 03/11/2020 04:09 PM

SAMPLE RECEIVED CONDITION

Date samples received:	9-NOV-2020
Sample received in good order:	Yes
NMI Quotation no. provided:	
Client purchase order number:	60612561_4_1
Temperature of samples:	Chilled
Comments:	all ok
Mode of Delivery:	Courier

Additional Terms and Conditions

Incomplete / unclear information about samples or required testing will delay the start of the analysis work

If you require your Purchase Order (PO) number to be included on our invoice, please provide the number during sample submission and before the completion of work to avoid unnecessary delays and/or additional processing/handling fees.

The lodgement of an order or receipt of samples for NMI services referenced in this Sample Receipt Notification constitutes an acceptence of the current version of NMI Terms and Conditions or other applicable Terms referenced in the NMI Quotation. NMI Terms and Conditions are available on the web at https://www.industry.gov.au/client-services/testing-and-analysis-services/chemical-and-biological-analysis-services-terms-and-conditions

REPORT OF ANALYSIS

Client	[redacted]	**Job No.**	: AECO03/201222/1
		Quote No.	: QT-02018
		Order No.	: 60612561
		Date Received	: 22-DEC-2020
Attention		**Sampled By**	: CLIENT
Project Name			
Your Client Services Manager	: [redacted]	**Phone**	: [redacted]

Lab Reg No.	Sample Ref	Sample Description
N20/031633	1302_QC200_201216	WATER 16/12/20 0:00
N20/031634	1302_QC201_201216	WATER 16/12/20 0:00

Lab Reg No.		N20/031633	N20/031634			
Date Sampled		16-DEC-2020	16-DEC-2020			
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05	<0.05			NR70
PFPeA (2706-90-3)	ug/L	<0.02	<0.02			NR70
PFHxA (307-24-4)	ug/L	<0.01	0.022			NR70
PFHpA (375-85-9)	ug/L	<0.01	<0.01			NR70
PFOA (335-67-1)	ug/L	<0.01	<0.01			NR70
PFNA (375-95-1)	ug/L	<0.01	<0.01			NR70
PFDA (335-76-2)	ug/L	<0.01	<0.01			NR70
PFUdA (2058-94-8)	ug/L	<0.01	<0.01			NR70
PFDoA (307-55-1)	ug/L	<0.01	<0.01			NR70
PFTrDA (72629-94-8)	ug/L	<0.02	<0.02			NR70
PFTeDA (376-06-7)	ug/L	<0.02	<0.02			NR70
PFHxDA (67905-19-5)	ug/L	<0.02	<0.02			NR70
PFODA (16517-11-6)	ug/L	<0.05	<0.05			NR70
FOUEA (70887-84-2)	ug/L	<0.01	<0.01			NR70
PFDS (335-77-3)	ug/L	<0.01	<0.01			NR70
PFPeS (2706-91-4)	ug/L	<0.01	<0.01			NR70
PFHxS (355-46-4)	ug/L	<0.01	0.12			NR70
PFHpS (375-92-8)	ug/L	<0.01	<0.01			NR70
PFOS (1763-23-1)	ug/L	<0.02	0.19			NR70
PFNS (68259-12-1)	ug/L	<0.01	<0.01			NR70
PFBS (375-73-5)	ug/L	<0.01	0.011			NR70
PFOSA (754-91-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02	<0.02			NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02	<0.02			NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01	<0.01			NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05	<0.05			NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05			NR70
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01			NR70

REPORT OF ANALYSIS

Lab Reg No.		N20/031633	N20/031634			
Date Sampled		16-DEC-2020	16-DEC-2020			
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
6:2 FTS (27619-97-2)	ug/L	<0.01	<0.01			NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01			NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01			NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02			NR70
PFBA (Surrogate Recovery)	%	104	107			NR70
PFPeA (Surrogate Recovery)	%	101	105			NR70
PFHxA (Surrogate Recovery)	%	100	107			NR70
PFHpA (Surrogate Recovery)	%	100	105			NR70
PFOA (Surrogate Recovery)	%	103	111			NR70
PFNA (Surrogate Recovery)	%	118	94			NR70
PFDA (Surrogate Recovery)	%	94	78			NR70
PFUdA (Surrogate Recovery)	%	83	68			NR70
PFDoA (Surrogate Recovery)	%	80	49			NR70
PFTeDA (Surrogate Recovery)	%	92	74			NR70
PFHxDA (Surrogate Recovery)	%	82	81			NR70
FOUEA (Surrogate Recovery)	%	64	66			NR70
PFBS (Surrogate Recovery)	%	106	108			NR70
PFHxS (Surrogate Recovery)	%	101	110			NR70
PFOS (Surrogate Recovery)	%	89	113			NR70
PFOSA (Surrogate Recovery)	%	76	63			NR70
N-MeFOSA (Surrogate Recovery)	%	53	53			NR70
N-EtFOSA (Surrogate Recovery)	%	61	44			NR70
N-MeFOSAA (Surrogate Recovery)	%	78	55			NR70
N-EtFOSAA (Surrogate Recovery)	%	72	44			NR70
N-MeFOSE (Surrogate Recovery)	%	53	48			NR70
N-EtFOSE (Surrogate Recovery)	%	78	56			NR70
4:2 FTS (Surrogate Recovery)	%	88	113			NR70
6:2 FTS (Surrogate Recovery)	%	78	88			NR70
8:2 FTS (Surrogate Recovery)	%	68	76			NR70
8:2 diPAP (Surrogate Recovery)	%	81	101			NR70
Dates						
Date extracted		5-JAN-2021	5-JAN-2021			
Date analysed		5-JAN-2021	5-JAN-2021			

N20/031633
to
N20/031634

PFOS and PFHxS are quantified using a combined branched and linear standard,

[redacted]

REPORT OF ANALYSIS

linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

Selected PFAS surrogate recoveries are biased due to matrix effects.ô
Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N >10.

[redacted], Analyst
Organics - NSW
Accreditation No. 198

06-JAN-2021

NATA
ACCREDITED FOR
TECHNICAL
COMPETENCE

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1299483*

Measurement Uncertainty is available upon request.
Chemical Accreditation 198: [redacted]

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO03/201222/1 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	113	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	70	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	70	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	69	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	72	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	62	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	76	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	68	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	80	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	65	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	63	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	75	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	75	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	70	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	69	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	68	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	69	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	70	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	77	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	78	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	76	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	69	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	72	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	64	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	62	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	84	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	70	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	59	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	80	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	64	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	76	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	63	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	68	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference.

Signed: [redacted]

[redacted]
Organics Manager, NMI-North Ryde

Date: **6/01/2021**

[redacted]

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO03/210127 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	103	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	87	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	109	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	92	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	94	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	100	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	86	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	86	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	92	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	100	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	87	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	114	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	108	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	116	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	100	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	100	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	93	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	94	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	89	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	90	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	90	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	98	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	127	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	90	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	77	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	90	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	104	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	81	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	105	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	104	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	98	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	91	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	88	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference.

Signed: [redacted]

[redacted]
Organics Manager, NMI-North Ryde

Date: **1/02/2021**

[redacted]

Australian Government
Department of Industry, Science, Energy and Resources

National Measurement Institute

NATA

REPORT OF ANALYSIS

Report No. RN1302294

Client	[redacted]	**Job No.**	: AECO03/210127
		Quote No.	: QT-02018
		Order No.	: 60612561_4_1
		Date Received	: 27-JAN-2021
Attention		**Sampled By**	: CLIENT
Project Name			
Your Client Services Manager	: [redacted]	**Phone**	: [redacted]

Lab Reg No.	Sample Ref	Sample Description
N21/001633	1302_QC200_210119	WATER 20/01/2021 03:17

Lab Reg No.		N21/001633				
Date Sampled		20-JAN-2021				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05				NR70
PFPeA (2706-90-3)	ug/L	<0.02				NR70
PFHxA (307-24-4)	ug/L	<0.01				NR70
PFHpA (375-85-9)	ug/L	<0.01				NR70
PFOA (335-67-1)	ug/L	<0.01				NR70
PFNA (375-95-1)	ug/L	<0.01				NR70
PFDA (335-76-2)	ug/L	<0.01				NR70
PFUdA (2058-94-8)	ug/L	<0.01				NR70
PFDoA (307-55-1)	ug/L	<0.01				NR70
PFTrDA (72629-94-8)	ug/L	<0.02				NR70
PFTeDA (376-06-7)	ug/L	<0.02				NR70
PFHxDA (67905-19-5)	ug/L	<0.02				NR70
PFODA (16517-11-6)	ug/L	<0.05				NR70
FOUEA (70887-84-2)	ug/L	<0.01				NR70
PFDS (335-77-3)	ug/L	<0.01				NR70
PFPeS (2706-91-4)	ug/L	<0.01				NR70
PFHxS (355-46-4)	ug/L	0.066				NR70
PFHpS (375-92-8)	ug/L	<0.01				NR70
PFOS (1763-23-1)	ug/L	0.16				NR70
PFNS (68259-12-1)	ug/L	<0.01				NR70
PFBS (375-73-5)	ug/L	<0.01				NR70
PFOSA (754-91-6)	ug/L	<0.01				NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02				NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02				NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01				NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01				NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05				NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05				NR70
4:2 FTS (757124-72-4)	ug/L	<0.01				NR70
6:2 FTS (27619-97-2)	ug/L	<0.01				NR70

REPORT OF ANALYSIS

Lab Reg No.		N21/001633				
Date Sampled		20-JAN-2021				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
8:2 FTS (39108-34-4)	ug/L	<0.01				NR70
10:2 FTS (120226-60-0)	ug/L	<0.01				NR70
8:2 diPAP (678-41-1)	ug/L	<0.02				NR70
PFBA (Surrogate Recovery)	%	112				NR70
PFPeA (Surrogate Recovery)	%	120				NR70
PFHxA (Surrogate Recovery)	%	115				NR70
PFHpA (Surrogate Recovery)	%	126				NR70
PFOA (Surrogate Recovery)	%	127				NR70
PFNA (Surrogate Recovery)	%	109				NR70
PFDA (Surrogate Recovery)	%	100				NR70
PFUdA (Surrogate Recovery)	%	113				NR70
PFDoA (Surrogate Recovery)	%	97				NR70
PFTeDA (Surrogate Recovery)	%	106				NR70
PFHxDA (Surrogate Recovery)	%	90				NR70
FOUEA (Surrogate Recovery)	%	86				NR70
PFBS (Surrogate Recovery)	%	118				NR70
PFHxS (Surrogate Recovery)	%	120				NR70
PFOS (Surrogate Recovery)	%	102				NR70
PFOSA (Surrogate Recovery)	%	95				NR70
N-MeFOSA (Surrogate Recovery)	%	80				NR70
N-EtFOSA (Surrogate Recovery)	%	103				NR70
N-MeFOSAA (Surrogate Recovery)	%	87				NR70
N-EtFOSAA (Surrogate Recovery)	%	95				NR70
N-MeFOSE (Surrogate Recovery)	%	94				NR70
N-EtFOSE (Surrogate Recovery)	%	123				NR70
4:2 FTS (Surrogate Recovery)	%	105				NR70
6:2 FTS (Surrogate Recovery)	%	101				NR70
8:2 FTS (Surrogate Recovery)	%	87				NR70
8:2 diPAP (Surrogate Recovery)	%	137				NR70
Dates						
Date extracted		29-JAN-2021				
Date analysed		29-JAN-2021				

N21/001633
PFOS and PFHxS are quantified using a combined branched and linear standard,
linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

REPORT OF ANALYSIS

Lab Reg No.		N21/001633				
Date Sampled		20-JAN-2021				
	Units					Method

[redacted] Analyst
Organics - NSW
Accreditation No. 198

02-FEB-2021

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1302287*

Measurement Uncertainty is available upon request.
Chemical Accreditation 198: [redacted]

Australian Government
Department of Industry, Science, Energy and Resources

National Measurement Institute

SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [redacted]
Customer:
Address:
Email:
Telephone:
Fax:

LABORATORY DETAILS

Lab: [redacted]
Contact:
Address:
Email:
Telephone
Fax:

SAMPLE DETAILS

NMI Job Name: AECO03/210127

Total No. of Samples: 1

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N21/001633	3-FEB-2021	1302_QC200_210119	WATER 20/01/2021 03:17

SAMPLE RECEIVED CONDITION

Date samples received:	27-JAN-2021
Sample received in good order:	Yes
NMI Quotation no. provided:	
Client purchase order number:	60612561_4_1
Temperature of samples:	Chilled
Comments:	ALL OK
Mode of Delivery:	Courier

Additional Terms and Conditions

Incomplete / unclear information about samples or required testing will delay the start of the analysis work

If you require your Purchase Order (PO) number to be included on our invoice, please provide the number during sample submission and before the completion of work to avoid unnecessary delays and/or additional processing/handling fees.

The lodgement of an order or receipt of samples for NMI services referenced in this Sample Receipt Notification constitutes an acceptence of the current version of NMI Terms and Conditions or other applicable Terms referenced in the NMI Quotation. NMI Terms and Conditions are available on the web at https://www.industry.gov.au/client-services/testing-and-analysis-services/chemical-and-biological-analysis-services-terms-and-conditions

Appendix F

Calibration Certificate

Appendix F Calibration Certificate

RAAF DWN

AECOM Imagine it. Delivered.

[redacted]

Equipment Information

Instrument: YSI PRO

Serial Number:

Equipment Check

	Enclosed	Comment
YSI Pro Plus Display	☑	
YSI Quatro Sonde	☑	
- YSI 1001 pH Probe	☑	
- YSI 1002 ORP Probe	☑	
- YSI 5560 Cond/Temp Probe	☑	
- YSI Polarographic DO Sensor	☑	
Flow Cell & Attachments (x2)	☐	N/A
Probe Guard	☐	N/A
Rubber Storage/Calibration Sleeve	☑	
Calibration Cup + Cap	☑	
YSI Cable Management Kit	☑	
YSI Pro Series ProComm II Kit	☑	
User Manual + Flow Cell Manual	☑	
Spare Batteries (x2) & Screwdriver	☑	
Laminated Quick Start Guide	☑	

Sensor Calibration Details

	Calibration Undertaken	Accuracy	Pass	Fail
Temperature	Factory Calibrated	±0.2°C	☑	☐
Dissolved Oxygen	☐ 100% Saturation	±2%	☐	☐
	Pressure Compensation ____hPa		☐	☐
Conductivity	☑ 12.88mS/cm	±0.5%	☑	☐
	☑ Check linearity at 1.413mS/cm	±0.5%	☑	☐
Salinity	Auto Calibrated	±1%	☐	☐
pH	☑ pH 7.00 ☑ pH 4.00	± 0.2	☐	☐
	☑ pH 10	± 0.2	☐	☐
ORP	☑ 244 mV at 21.9 °C	±20mV	☐	☐

This is to certify that where possible, this instrument has been calibrated in accordance with the manufacturer's calibration procedure as recommended in the instrument service manual.

Name: [redacted]

Signature: [redacted] Date: 29/10/20

AECOM Imagine it. Delivered.

[redacted]

Equipment Information

Instrument: YSI Professional

Serial Number: 19G102635

Equipment Check

	Enclosed	Comment
YSI Pro Plus Display	☐	
YSI Quatro Sonde	☐	
- YSI 1001 pH Probe	☐	
- YSI 1002 ORP Probe	☐	
- YSI 5560 Cond/Temp Probe	☐	
- YSI Polarographic DO Sensor	☐	
Flow Cell & Attachments (x2)	☐	
Probe Guard	☐	
Rubber Storage/Calibration Sleeve	☐	
Calibration Cup + Cap	☐	
YSI Cable Management Kit	☐	
YSI Pro Series ProComm II Kit	☐	
User Manual + Flow Cell Manual	☐	
Spare Batteries (x2) & Screwdriver	☐	
Laminated Quick Start Guide	☐	

Sensor Calibration Details

	Calibration Undertaken	Accuracy	Pass	Fail
Temperature	Factory Calibrated	±0.2°C	☐	☐
Dissolved Oxygen	☐ 100% Saturation	±2%	☐	☐
	Pressure Compensation ____hPa		☐	☐
Conductivity	☑ 12.88mS/cm : 12.87 mS/cm	±0.5%	☑	☐
	☑ Check linearity at 1.413mS/cm : 1444	±0.5%	☑	☐
Salinity	Auto Calibrated	±1%	N/A	☐
pH	☑ pH 7.00 : 7.69	± 0.2	☐	☑
	☑ pH 10.00 : 9.75 pH 4.00 : 4.80	± 0.2	☐	☑
ORP	☑ 233 mV at 24 °C : 251	±20mV	☑	☐

This is to certify that where possible, this instrument has been calibrated in accordance with the manufacturer's calibration procedure as recommended in the instrument service manual.

Name [redacted] .....

Signature: [redacted] .....

Date: 19/1/2024

Prepared for
Department of Defence, Directorate of PFAS Remediation, Environment and Engineering Branch
ABN: 68706814312

Sampling Event Factual Report, April and May 2021

PFAS OMP - RAAF Base Darwin

26-Oct-2021
RAAF Base Darwin
Doc No. 20200323_OMP001

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Delivering a better world

Sampling Event Factual Report, April and May 2021

PFAS OMP - RAAF Base Darwin

Client: Department of Defence,
Directorate of PFAS Remediation,
Environment and Engineering Branch

ABN: 68706814312

Prepared by

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ABN 20 093 846 925

26-Oct-2021

Job No.: 60612561

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 and ISO45001.

Quality Information

Document	Sampling Event Factual Report, April and May 2021 PFAS OMP - RAAF Base Darwin
Ref	60612561_1302_DWN_Factual Report_Q1_2021_Rev0.docx
Date	26-Oct-2021
Prepared by	Imogen Cescato and Mark Vial
Reviewed by	David Steele

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
A	17-June-2021	Draft for Review	James Guzman Project Manager	
0	26-Oct-2021	Draft for Review	James Guzman Project Manager	

Table of Contents

List of Tables (in Text)

Abbreviations

Term	Description
AECOM	AECOM Australia Pty Ltd
ALS	ALS Environmental Pty Ltd
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999
DCMM	Defence Contamination Management Manual
DIA	Darwin International Airport
DO	Dissolved oxygen
DoH	Department of Health
EC	Electrical conductivity
FSANZ	Food Standards Australia and New Zealand
HEPA	Heads of Environmental Protection Agencies
LOR	Limit of reporting
mAHD	metres Australian Height Datum
mbtoc	metres below top of casing
NATA	National Association of Testing Authorities
NEMP	National Environmental Management Plan
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
NT	Northern Territory
NTU	Nephelometric Turbidity Unit
NSW	New South Wales
OMP	Ongoing Monitoring Program
ORP	Oxidation-reduction potential
PFAS	Per- and poly-fluoroalkyl substances
PFHxS	Perfluorohexane sulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance/Quality Control
SAQP	Sampling Analysis Quality Plan
SWL	Standing Water Level

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Program (OMP) outlined in the *PFAS Management Area Plan (PMAP)* (Department of Defence, 2019a) at RAAF Base Darwin (the 'Site') in the Northern Territory. The location of the Site and Management Area is shown in **Figure 1** in **Appendix A**. The OMP (Department of Defence, 2019a) for the Site outlines the requirement to complete annual biota sampling and biannual groundwater and surface water sampling.

The primary purpose of the OMP program is to monitor changes to the PFAS impact in groundwater and surface water pathways associated with sources of PFAS as initially assessed through the detailed site investigation phase of works. Changes may result from the specific or cumulative impact of remediation or containment actions, existing transportation trends, and changes to hydrogeology or weather events.

The monitoring program at RAAF Base Darwin includes a regime of groundwater, surface water and biota sampling to capture these changes in the long term, to enable Defence to maintain an up-to-date understanding of temporal and spatial distribution, concentration and transport of PFAS contaminants.

1.2 Objectives

As noted above, the objective of the PFAS OMP is to provide information on changes to PFAS contamination originating from Defence property to inform risk management decisions by Defence to protect human health and the environment.

The purpose of this PFAS OMP factual report is to summarise the scope of works and findings for the April-May 2021 groundwater and surface water sampling event, conducted in accordance with the Sampling and Analysis Quality Plan (SAQP) (AECOM, 2019).

This report has been prepared in accordance with the *Defence PFAS OMP factual reports – interim guidance for preparation,* v0.2, May 2021 (Department of Defence, 2021).

An annual interpretive report will be subsequently developed for the purpose of assessing the data collected during the discrete monitoring events completed over the preceding 12-month period and will include assessment of environmental variability and any statistically significant trends in PFAS concentrations.

2.0 Scope of work

The sampling event was completed in general accordance with the SAQP (AECOM, 2019).

Prior to commencement of the sampling events, the SAQP was reviewed to ensure compliance with the following:

- The OMP (Department of Defence, 2019a)
- PFAS National Environmental Management Plan (NEMP) (HEPA, 2020)
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM)
- Defence Routine Environment Water Quality Monitoring Manual (Department of Defence, 2019b)
- AS/NZ 5667:1998 Water quality – Sampling (AS/NZS, 1998)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2018); and
- Relevant Territory regulatory guidelines.

In summary, the scope of works for this sampling event, conducted in April and May 2021, included:

- Collection of 30 groundwater samples (including gauging of groundwater levels) from 31 planned existing monitoring wells using Hydrasleeves™ (refer to **Table 1** below, and **Figure 2** in **Appendix A** for specific locations). It is noted that one monitoring location could not be sampled during this sampling event; refer to **Table 7** for more details.
- Collection of 17 surface water samples from 17 of the 22 planned sampling locations (refer to **Table 2** below, and **Figure 3** in **Appendix A** for specific locations). Five locations were dry and surface water samples were therefore unable to be collected from those locations during this sampling event.
- Collection of intra- and inter-laboratory duplicate samples at a rate of 1 in 10 primary samples, one rinsate and one field blank sample per fieldwork day for groundwater and surface water.
- Analysis of all samples for a suite of 28 PFAS analytes at the standard limit of reporting (LOR).
- Data management of the OMP field and laboratory data in the Defence ESdat database
- Preparation of this Sampling Event Factual Report.

2.1 Planned monitoring locations

The monitoring locations outlined within the Sampling Analysis and Quality Plan (SAQP) for the OMP groundwater and surface water sampling events are tabled below:

Table 1 Groundwater sampling locations

Area	Description	Sampling locations	Number of wells/bores	Total
On Site	Former Fuel Farm 1	MW215	1	19 Locations
	Former Fuel Farm 5	MW297, MW112	2	
	Former Fuel Farms	MW303, MW133, MW205	3	
	Former Fire Training Area 1	MW422, MW139	2	
	Current Fire Training Area	MW240, MW241	2	
	Hangar 31	MW405*	1	
	RAAF Fire Station	MW103	1	

Area	Description	Sampling locations	Number of wells/bores	Total
	Former ARFF Fire Station	MW115	1	
	Source area downgradient transect	MW107, MW128	2	
	Southern Boundary of site	MW141, MW144	2	
	Western boundary of site	MW148	1	
	Rapid Creek – eastern end	MW156	1	
Off Site	Former Fire training area 2, Darwin International Airport (DIA)	MW197	1	12 Locations
	Off-Base (north)	MW185	1	
	Rapid Creek	MW191, MW193, MW194, MW195	4	
	Off-Base (south)	MW176, MW180, MW200, MW211	4	
	Off-Base (south west)	MW209	1	
	Off-Base (west)	MW210	1	

*Location not sampled. Refer to Table 3 and Table 7 for further details

Table 2 Surface water sampling locations

Area	Description	Sampling locations	Number of locations	Total
On Site	Surface water flow – current fire training ground	SW156*	1	7 Locations
	Stormwater pipe - Airside operations	SW160*	1	
	Stormwater– southern boundary	SW162	1	
	Surface water drain - Eastern end of runway	SW170	1	
	Surface water drain - near Former Fuel Farm 5	SW178*	1	
	Surface water drain - north of Former Fuel Farms 4 & 6	SW181*	1	
	Rapid Creek	SW101	1	
Off Site	Rapid Creek	SW104, SW106, SW108, SW109, SW112, SW113	6	15 Locations
	DIA drain to Rapid Creek	SW114, SW115, SW168	3	
	Ludmilla Creek	SW120, SW124, SW125*	3	
	Reichardt Creek	SW132, SW133	2	

Area	Description	Sampling locations	Number of locations	Total
	Drain to Sadgroves Creek	SW143	1	

*Location not sampled. Refer to Table 7 for further details

2.2 Deviations from the SAQP

The works completed during this sampling event included some deviations from the SAQP (AECOM, 2019) as outlined in **Table 3**.

Table 3 Deviations from the SAQP during sampling event for April / May 2021

SAQP	April / May sampling event
31 groundwater locations are identified to be sampled as part of the biannual sampling event	Monitoring location MW405 could not be sampled due to the location being impacted by AIR7000 development. The previous investigation engaged a surveyor from Earl James & Associates (EJA: Surveying and Planning Services) to confirm the position of the well. The groundwater well could not be found and is assumed destroyed. MW405 is a source area well for Hanger 31. As such, this source area is currently not represented by a monitoring well.
22 surface waters locations are identified to be sampled as part of the sampling event	Monitoring locations SW125, SW156, SW160, SW178 and SW181 were dry and were not sampled. Downgradient surface water locations were sampled for each of the dry locations and PFAS results from those locations were within expected value ranges. As such, it is unlikely that the dry locations would exhibit PFAS values above the expected ranges for their respective locations.
The depth to groundwater will be measured in each monitoring well prior to collection of groundwater samples	An attempt was made to collect all depth to groundwater data within a 24-hour period, but access permissions limitations prevented the staff from collecting within this timeframe. However, most locations were collected within a single 24-hour period and/or before precipitation occurred.
Sampling of groundwater and surface water for the non-PFAS suite.	Defence notified the AECOM project management team via email on 27th January 2021 that "*all future OMP sampling events across all sites, the inclusion of non-PFAS analysis will need to be justified in advance and agreed by Defence Tech Policy through review of the SAQP*".

3.0 Sampling methodology

The methodology adopted for the biannual groundwater and surface water sampling event conducted from April to May 2021 was in general accordance with the SAQP (noting that changes/deviations are captured in **Section 2.2**) and is summarised below:

Table 4 Sampling methodology

Item	Details
Groundwater and surface water methodology	
Groundwater gauging	The depth to groundwater was measured in each monitoring well immediately prior to collection of groundwater samples using an interface probe.
Field parameters	Where appropriate, groundwater and surface water field parameters were recorded ex-situ and in-situ, respectively, using a YSI Pro Water Quality Meter.

Item	Details
	Parameters recorded consisted of the following: Temperature (°C), electrical conductivity (EC), dissolved oxygen (DO), oxidation-reduction potential (ORP) and pH. Observations of odour, colour and clarity (turbidity) of groundwater and surface water were recorded at each site. Calibration certificates for the YSI Pro Water Quality Meter utilised for the April / May sampling event can found in **Appendix G**.
Sampling methodology	Groundwater samples were collected from all accessible wells using no-purge methodology HydraSleeves™, which were installed within the screened interval of the wells for a minimum of 24 hours prior to sampling. HydraSleeve™ placement was based on a review of the well construction logs. Once sampling was completed, new HydraSleeves™ were then redeployed within the screened interval in preparation for the next sampling round. Surface water samples were collected from either mid-way through the water column or approximately 0.5 m below the surface (if possible) with care taken to minimise collection of sediment or floating materials in the samples. At each location, laboratory supplied bottles were lowered into the water using an aluminium sampling pole, with the cap immediately applied once the container was full and retrieved from the water.
QAQC samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples and rinsate samples. Refer to **Appendix D** for assessment of QAQC sample data.
Sample analysis	Samples were submitted to the primary and secondary laboratories for analysis. ALS Environmental (ALS) Sydney, NSW was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for analyses were certified by the National Association of Testing Authorities (NATA). Laboratory certificates are presented in **Appendix F.**

3.1 Adopted screening criteria

3.1.1 Groundwater and surface water

Screening criteria were selected on the basis of national guidance in the form of the PFAS National Environmental Management Plan, Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset includes the following:

- Department of Health (DoH) Health Based Guidance Values for PFAS for use in site investigations in Australia (Department of Health, 2019).
- Heads of the Environment Protection Authority (HEPA), PFAS National Environmental Management Plan (NEMP) (HEPA, 2020).
- National Health and Medical Research Council (NHMRC), Guidance on PFAS in Recreational Water (NHMRC, 2019).

The adopted screening criteria which have been adopted for groundwater and surface water are presented in **Table 5**.

Table 5 Summary of adopted screening criteria for groundwater and surface water

Pathway	Compound	Criteria	Comment/Reference
Human Health Receptors			
Drinking water - groundwater	PFOS + PFHxS	0.07 µg/L	These values are from the PFAS NEMP (HEPA, 2020). *All surface water and groundwater results will be compared to these criteria.*
	PFOA	0.56 µg/L	
Recreational use – surface water	PFOS + PFHxS	2 µg/L	These values are from Guidance on PFAS in Recreational Water (NHMRC, 2019). *All surface water results will be compared to these criteria.*
	PFOA	10 µg/L	
Ecological Receptors			
Freshwater (99% species protection values)	PFOS PFOA	0.00023 µg/L 19 µg/L	These values are from the PFAS NEMP (HEPA, 2020). The 99% level of protection has been applied for slightly to moderately disturbed ecosystems. This approach is generally adopted for chemicals that bioaccumulate and biomagnify in wildlife. For the purposes of preliminary screening of analytical water results, the laboratory LOR will be adopted rather than sole use of the criteria value. *All surface water and groundwater results will be compared to these criteria.*

3.2 Data quality objectives and data validation

The data quality objectives (DQOs) and data quality indicators (DQIs) adopted for these works are presented in the SAQP (AECOM, 2019).

Data validation assessment is provided in **Appendix D**.

Key findings from the data validation were as follows:

Groundwater

- Elevated RPDs should be taken into consideration when using data for PFHxS, PFPeS, PFHxA, PFHpS, PFBS and Sum of PFAS quantitatively.
- Elevated RPDs should be taken into consideration when interpreting data for PFOA, PFOS and Sum of PFHxS and PFOS where close to guidelines.
- The potential exists for concentrations of PFOA to be below the LOR, but above the adopted freshwater species protection guideline in sample MW180 and this should be taken into consideration when interpreting results.

Surface water

- The potential exists for concentrations of PFOA to be below the LOR, but above the adopted freshwater species protection guideline in samples SW113, SW124 and associated duplicate samples QC100 and QC200, SW133 and SW143, and this should be taken into consideration when interpreting results.

Data validation procedures employed in the assessment of the field and laboratory QA/QC data are indicative that the overall quality of the analytical data produced is acceptably reliable for the purpose of this report.

All data collected during this event has been reviewed and uploaded to the Defence ESdat database in accordance with Defence Contamination Management Manual (DCMM) (Defence, 2018 as amended 2019) Annex L requirements.

4.0 Field observations and results

4.1 general field observations

The following field observations were applicable across the entirety of the sampling event.

Table 6 General Field Observations

Item	Observation
Weather conditions	Weather in general was observed to be partly cloudy, 26-33 °C and humid during the sampling event. 32.8 mm of rainfall was reported between 28 and 29 April, and no rainfall was reported on 6 May at Darwin Airport. No rain was recorded for eleven days prior to sampling (Darwin Airport weather station, 014015) (Bureau of Meteorology, 2021).
Estate Management Works or Training Activities	During the sampling event, no notable estate works, or training activities were observed in the vicinity of sampling locations with the exception of the following: • Current AIR7000 construction activities, which during the sampling event consisted of significant earthworks and construction of new buildings. The AIR7000 project is being conducted in the vicinities of source areas 07 (Hanger 31) and 08 (Former Fuel Farm 1). Works conducted as part of the AIR7000 have resulted in the destruction of monitoring well MW405 and has limited access to the area. As a result, data cannot currently be collected to monitor PFAS concentrations and groundwater conditions related to Source Area 07. MW215 does provide a downgradient monitoring location to track PFAS concentrations in the area and will continue to be monitored to suit that purpose.

4.2 Groundwater

4.2.1 Field observations and field measurements

Table 7 Groundwater observations and field measurements

Item	Observations and field measurements
Fieldwork Dates	The groundwater sampling was completed between 28-29 April and 6 May 2021.
Access and Sample Collection	All monitoring wells and bores were accessible and able to be sampled with the exception of the following: Monitoring well MW405 was not sampled due to not being able to be located. AECOM is currently analysing an appropriate alternative well with consideration to access, well construction details, location, and historical results. A recommendation to replace MW405 will be provided in the upcoming 2021 RAAF Darwin PFAS OMP Interpretive Report.
Monitoring Well Network Condition	The monitoring well network was generally in good condition and unchanged from the previous round with exception of Well MW405.
Field Observations	Monitoring wells MW133, MW297 and MW303 located near the fuel tank farm on Bombing Road were observed to emit a hydrocarbon odour. Roots were observed in monitoring well MW103.

Item	Observations and field measurements
Depth to Groundwater and flow direction	Depth to groundwater was recorded from each of the 30 wells visited, ranging from 1.38 (MW209) to 8.434 (MW144) metres below top of casing (m btoc). Groundwater elevations in the aquifer were between 3.70 (MW185) and 27.29 (MW115) metres Australian Height Datum (m AHD). Groundwater gauging data is presented in **Table T1** in **Appendix B**. Inferred groundwater contours and groundwater flow directions at the Site in April 2021 are shown on **Figure 4** in **Appendix A**. Depth to water data was collected from monitoring wells MW128, MW133, MW139, MW141, MW148, MW193, MW194, MW195 and MW422 on 6 May 2021, and were thus not included in groundwater elevation contours. A localised high point is located in the centre of the Base, south of the runway, with the groundwater flow radiating from this location. Groundwater in the north and west portions of the Base is inferred to generally flow north west towards the coast, with localised flow towards Ludmilla Creek on the western boundary of the Base and Rapid Creek north of the Base. Groundwater to the south of the site is inferred to flow towards Charles Darwin National Park and Francis Bay. Groundwater contours are generally consistent with the Detailed Site Investigation (Department of Defence, 2018) flow direction.
Geochemical Parameters	Groundwater geochemical parameters were measured during sample collection from the HydraSleeve™ using a decontaminated YSI cup and YSI Pro Water Quality Meter. The readings are presented in **Table T1** in **Appendix B**, and are summarised below: • DO ranged from 0.36 mg/L (MW303) to 3.71 mg/L (MW115). • EC ranged from 37.5 µS/cm (MW205) to 1258 µS/cm (MW185) indicating a relatively low salinity. • pH ranged from 4.51 (MW241) to 7.77 (MW185) indicating slightly acidic to neutral conditions. • ORP (corrected) ranged from -62.9 mV (MW303) to 280.7 mV (MW139) indicating oxidising to reducing conditions.

4.2.2 PFAS groundwater analytical results

During this sampling event, all groundwater locations sampled reported concentrations of PFAS above the laboratory limits of reporting (LOR). There were no first-time detections above the limit of reporting or screening criteria in the dataset.

The PFAS groundwater analytical results from the April / May 2021 sampling event are presented in Table T2 in Appendix B Surface water

4.2.3 Field observations and field measurements

Table 8 Surface water observations and field measurements

Compound	Criteria
Fieldwork Dates	Surface water sampling was completed on 28-29 April and 6 May 2021.
Access and Sample Collection	Seventeen of the proposed twenty-two surface water sampling locations were accessible or able to be sampled: • Surface water samples were not collected from five locations (SW125, SW156, SW160, SW178 and SW181) due to the locations being dry.
Contamination Observations	No obvious visible signs of contamination were observed.

Compound	Criteria
Surface Water Flow	Surface water flows across RAAF Darwin were moderate to minimal with drainage line locations SW125, SW156, SW160, SW178 and SW181 presenting dry. All locations off-base were able to be sampled and where applicable, sample collection was timed to coincide with an outgoing tide.
Geochemical Parameters	Surface water geochemical parameters were measured prior to collecting surface water samples in April / May 2021. The stabilised readings are presented in **Table T3** in **Appendix B**, and are summarised below: • Dissolved oxygen ranged from 1.13 mg/L (SW115) to 5.36mg/L (SW114) indicating relatively poorly oxygenated to well oxygenated conditions. • Electrical conductivity ranged. from 18 µS/cm (SW133) to 71652.0 µS/cm (SW120) indicating fresh to highly saline conditions. • pH ranged from 5.27 (SW101) to 8.09 (SW133) indicating slightly acidic to slightly alkaline conditions. • Redox (corrected) ranged from 47.8 mV (SW112) to 259.4 mV (SW104) indicating oxidising conditions.

4.2.4 PFAS surface water analytical results

The PFAS surface water analytical results from the April / May 2021 sampling events are presented in **Table T4** in **Appendix B**. There were no first-time detections above the limit of reporting or screening criteria in the dataset.

5.0 Summary and next sampling events

5.1 Summary of monitoring event

The bi-annual monitoring event was completed at the Site and publicly accessible land within the Management Area between 28-29 April and 6 May 2021. The program included sampling of:

- groundwater from 30 of a planned 31 monitoring wells (or alternative locations where available)
- surface water sampling at 17 of a planned 22 locations

The findings of the April / May 2021 sampling events and the recommended actions are summarised in **Table 9** below.

Table 9 Summary of sampling event

Item	Comment	Recommended actions
Access to sampling locations	The following were accessed and able to be sampled: • 30 out of 31 monitoring wells • 17 out of 22 surface water locations Monitoring well MW405 could not be located. The previous investigation identified that during the AIR7000 project development incorporated earthworks have destroyed the monitoring well. The surface water samples from locations SW125, SW156, SW160, SW178 and SW181 were not collected as the locations were dry.	No actions recommended. Based on discussion with the PFAS OMP Lead Consultant, it was determined that monitoring location MW215 would be a suitable replacement for MW405.
Analytical Results	PFAS concentrations were recorded above the LOR in all 30 monitoring wells sampled and 13 of the 17 surface water locations sampled.	No actions recommended. Ongoing monitoring in accordance with the OMP.
First time exceedance of screening criteria in groundwater and surface water	There were no first-time exceedances of the screening criteria across the sampled locations.	Ongoing monitoring in accordance with the OMP.
First time detection of PFAS in groundwater	There were no first-time detections of PFAS in groundwater or surface water samples.	No actions recommended.

5.2 Upcoming sampling events

The next biannual sampling event is scheduled for October 2021.

5.3 Upcoming annual interpretive report

The first annual interpretive report is scheduled to be delivered in July 2021.

6.0 References

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Appendix A

Figures

Appendix A Figures

AECOM

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.5 1 2

Kilometers

1:45,000 (when printed at A3)

Legend

- Drainage
- Highway
- Management Area
- RAAF Base Darwin
- Source Area

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
RAAF BASE DARWIN
PFAS OMP
FACTUAL REPORT
April – May 2021
Site and Management Area

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JAMES.GUZMAN 10 JUN 2021
VERSION:	1

Figure 01

A3 size

Filename: P:\606x\60612561\900_CAD_GIS\920_GIS\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2021\DWN_FactualRpt\60612561_Fig01_RAAFDarwin_Factual_PFASMgmntArea_A3L.mxd

AECOM
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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.2 0.4 0.8
Kilometers

1:20,000 (when printed at A3)

Legend

- Groundwater Monitoring Locations
- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
RAAF BASE DARWIN
PFAS OMP
FACTUAL REPORT
April – May 2021
Groundwater Sampling Locations

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JAMES.GUZMAN 10 JUN 2021
VERSION:	1

Figure 02

Filename: P:\606x\60612561\900_CAD_GIS\920_GIS\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2021\DWN_FactualRpt\60612561_Fig02_RAAFDarwin_Factual_OnOffBaseGW_A3L.mxd

A3 size

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.25 0.5 1 1.5

Kilometers

1:35,000 (when printed at A3)

Legend

- Surface Water Locations
- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
RAAF BASE DARWIN
PFAS OMP
FACTUAL REPORT
April – May 2021
Surface Water Locations

PROJECT ID	60612561
CREATED BY	KD
LAST MODIFIED	JAMES.GUZMAN 10 JUN 2021
VERSION:	1

Figure 03

Filename: P:\606x\60612561\900_CAD_GIS\920_GIS\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2021\DWN_FactualRpt\60612561_Fig03_RAAFDarwin_Factual_SWLocations_A3L.mxd

A3 size

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.2 0.4 0.8
Kilometers

1:20,000 (when printed at A3)

Legend

- Groundwater Monitoring Locations
- Not gauged or sampled in April/May 2021
- Inferred Groundwater Level
- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
RAAF BASE DARWIN
PFAS OMP
FACTUAL REPORT
April – May 2021
Inferred Groundwater Contours

PROJECT ID 60612561
CREATED BY KD
LAST MODIFIED JAMES.GUZMAN 10 JUN 2021
VERSION: 1

Figure 04

Filename: P:\606x\60612561\900_CAD_GIS\920_GIS\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2021\DWN_FactualRpt\60612561_Fig04_RAAFDarwin_Factual_GWContour_A3L.mxd

A3 size

Appendix B

Tables

Appendix B Tables

Table T1
Groundwater Field and Gauging Results
PFAS Ongoing Monitoring Program
Department of Defence- RAAF Darwin

AECOM

Location ID	Screening Interval (m bgl)	Hydrasleeve Deployment Collar Depth (mbgl)	Sampled Date	Depth to Water (mbtoc)	Well Depth (mbtoc)	Water Elevation (mAHD)	TOC (mAHD)	Well Condition	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Redox (mV)	Temp (^{o}C)	Turbidity	Water Colour	Odour	Sample Method/Comments
MW103	1-15	11	29/04/2021	4.201	12.62	15.35	19.55	Good	0.66	97.8	64	5.26	128.0	32.3	Turbid		No odour	Hydrasleeve
MW107	1-15	14	29/04/2021	4.125	15.36	17.82	21.94	Good	1.05	140.5	91	5.29	8.5	31.9	Turbid	Grey	Organic	Hydrasleeve
MW112	1-15	Not available	29/04/2021	5.143	14.11	21.83	26.97	Good	1.69	42.6	28	5.81	207.3	32.1	Turbid	Grye/brown	No odour	Hydrasleeve
MW115	1-15	Not available	29/04/2021	5.120	6.081	27.29	32.41	Good	3.71	45.5	30	7.28	164.4	31.0	Turbid	Brown	No odour	Hydrasleeve
MW128	1-15	13.5	6/05/2021	2.220	12.51	9.17	11.39	Good	0.83	69.6	45	4.67	273.4	31.7	Slightly turbid	Light grey/brown	No odour	Hydrasleeve
MW133	1-15	Not available	6/05/2021	7.030	-	23.18	30.21	Good	1.64	64.7	42	5.90	92.0	32.7	No turbidity	Clear/colourless	Hydrocarbon	Hydrasleeve
MW139	1-15	13	6/05/2021	3.820	13.58	24.73	28.55	Good	1.92	46.9	30	5.25	280.7	31.3	Turbid	Light grey/brown	No odour	Hydrasleeve
MW141	1-16	14.5	6/05/2021	6.640	14.24	23.46	30.10	Good	0.73	64.5	42	5.69	236.1	30.1	Turbid	Light grey/white	No odour	Hydrasleeve
MW144	1-15	13.5	29/04/2021	8.434	15.76	22.25	30.69	Good	2.43	43.6	28	5.10	241.2	32.3	No turbidity	Clear/colourless	No odour	Hydrasleeve
MW148	1-12	11.3	6/05/2021	2.910	11.48	9.25	12.16	Good	0.79	92.7	60	5.18	108.7	33.1	Turbid	Orange	Hydrogen sulfide	Hydrasleeve. Particulate matter floating in sleeve
MW156	1-15	Not available	29/04/2021	2.502	12.60	20.54	23.04	Good	1.10	67.2	44	5.01	74.7	30.2	No turbidity	Clear/colourless	Organic odour	Hydrasleeve. Sediment in sleeve
MW176	1-12	Not available	28/04/2021	3.774	11.69	14.97	18.74	Good	0.83	92.9	60	5.66	116.4	30.3	Turbid	Brown	No odour	Hydrasleeve
MW180	1-15	13.5	28/04/2021	7.097	12.99	21.96	29.06	Good	3.51	77	50	5.19	244	31.9	Turbid	Brown	No odour	Hydrasleeve
MW185	1-12	10.5	28/04/2021	2.124	10.53	3.70	5.82	Good	0.71	1936	1258	7.77	159.3	31.3	Very turbid	Red	No odour	Hydrasleeve
MW191	1-12	Not available	28/04/2021	3.290	12.73	7.62	10.91	Good	2.43	95.6	62	5.97	213	33	Turbid	Brown	No odour	Hydrasleeve
MW193	1-12	Not available	6/05/2021	2.670	10.58	10.47	13.14	Good	1.67	53.8	35	6.79	232.8	30.5	Turbid	Brown	Organic	Hydrasleeve
MW194	1-12	Not available	6/05/2021	1.740	11.65	16.50	18.24	Good	0.98	60.2	39	7.62	164.5	27.7	No turbidity	Clear	Hydrogen sulfide	Hydrasleeve
MW195	1-12	Not available	6/05/2021	1.610	10.68	15.13	16.74	Good	1.05	42.2	27	5.92	NA	27.6	Medium	Brown/light brown	Organic	Hydrasleeve. Sediment in sleeve
MW197	1-15	Not available	29/04/2021	6.085	15.04	20.11	26.20	Good	0.49	68.3	44	4.89	116.0	31.0	Turbid	Brown	No odour	Hydrasleeve
MW200	1-12	10.5	28/04/2021	5.400	12.69	20.83	26.23	Good	0.86	97.7	64	5.52	187.7	30.1	Turbid	Grey	Organic	Hydrasleeve
MW205	1-15	Not available	29/04/2021	4.445	14.84	25.13	29.57	Good	3.15	37.5	24	6.08	183.8	30.9	Turbid	Red-brown	No odour	Hydrasleeve
MW209	1-15	13.5	28/04/2021	1.384	14.91	5.59	6.97	Good	0.74	970	631	5.78	14	30.3	Turbid	Brown	Hydrogen sulfide	Hydrasleeve
MW210	1-10	10.5	28/04/2021	2.340	12.01	4.57	6.91	Good	0.71	289.6	188	6.13	1.4	31.1	Turbid	Brown	Hydrogen sulfide	Hydrasleeve
MW211	1-10	10.3	28/04/2021	4.874	11.85	17.64	22.51	Good	1.85	33.6	22	5.83	187.1	31.1	Turbid	Brown	No odour	Hydrasleeve
MW215	1.5-15	13.75	6/05/2021	6.730	13.20	-	-	Good	0.50	133.8	87	5.11	32.8	31.5	Turbid	Grey/brown	No odour	Hydrasleeve
MW240	1-15	Not available	29/04/2021	4.335	14.44	-	-	Good	1.40	97.6	63	5.30	97.0	33.1	No turbidity	Clear/colourless	No odour	Hydrasleeve
MW241	1-15	Not available	29/04/2021	3.723	14.45	-	-	Good	1.98	49.7	32	4.51	213.1	32.9	Turbid	Grey	No odour	Hydrasleeve
MW297	1-15	Not available	29/04/2021	6.638	15.21	22.89	29.53	Good	0.65	54.7	36	4.53	182.1	32.1	No turbidity	Clear/colourless	Hydrocarbon	Hydrasleeve
MW303	1-15	Not available	29/04/2021	8.428	15.53	23.51	31.94	Good	0.36	333.4	217	5.53	-62.9	33.1	No turbidity	Clear/colourless	Hydrocarbon	Hydrasleeve
MW422	1-12	11.5	6/05/2021	3.220	11.01	24.55	27.77	Good	2.88	44.2	29	5.83	259.9	31.8	No turbidity	Clear/light grey	No odour	Hydrasleeve

Notes:
mbtoc: meters below top of casing
mAHD: meters Australian Height Datum
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
oC: degrees celcius
NA: not available

Table T2
Groundwater Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence- RAAF Darwin

					PFAS Full Suite																													
					10:2 FTS	**4:2 FTS**	**6:2 FtS**	**8:2 FTS**	**EtFOSA**	**EtFOSAA**	**EtFOSE**	**MeFOSA**	**MFOSAA**	**MeFOSE**	**PFBS**	**PFBA**	**PFDS**	**PFDA**	**PFDoDA**	**PFHpS**	**PFHpA**	**PFHxA**	**PFNA**	**FOSA**	**PFPeS**	**PFPeA**	**PFTeDA**	**PFTrDA**	**PFUnDA**	**Sum of PFAS**	**Sum of PFHxS and PFOS**	**PFOS**	**PFOA**	**PFHxS**
					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
LOR					0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01	0.01	0.02
Ecological Receptors	PFAS NEMP FW 99% Species Protection																															**0.00023**	**19**	
Human Health Receptors	**PFAS NEMP Human Health Drinking Water**																														**0.07**		**0.56**	
	NHMRC (2019) PFAS Recreational Water																														**2**		**10**	
Location Code	**Field ID**	**Sample Date**	**Sample Type**	**Lab Report**																														
MW103	1302_MW103_210429	29/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.39	<0.1	<0.02	<0.02	<0.02	0.48	0.19	1.61	<0.02	0.02	0.79	0.26	<0.05	<0.02	<0.02	32.1	**27.9**	**17.3**	0.44	10.6
	1302_QC102_210429		Intralab Duplicate	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.53	0.1	0.02	<0.02	<0.02	0.71	0.26	2.24	<0.02	0.03	1.12	0.36	<0.05	<0.02	<0.02	46.3	**40.3**	**25.3**	**0.62**	15
	1302_QC202_210429		Interlab Duplicate	RN1314232	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.43	0.11	<0.01	<0.01	<0.01	0.3	0.16	1.2	0.012	<0.01	0.6	0.24	<0.02	<0.02	<0.01	25.4	**22**	**15**	0.4	7
MW107	1302_MW107_210429	29/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.26	<0.1	<0.02	<0.02	<0.02	0.22	0.09	0.66	<0.02	<0.02	0.36	0.13	<0.05	<0.02	<0.02	11.5	**9.58**	**6.23**	0.16	3.35
MW112	1302_MW112_210428	29/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.41	<0.1	<0.02	<0.02	<0.02	0.28	0.12	1.04	<0.02	<0.02	0.44	0.18	<0.05	<0.02	<0.02	15.6	**12.9**	**9.18**	0.22	3.73
MW115	1302_MW115_210429	29/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.76	0.5	0.1	<0.02	<0.02	3.41	0.6	6.76	0.02	0.12	4.36	1.15	<0.05	<0.02	<0.02	131	**110**	**80.5**	**1.47**	29.4
MW128	1302_MW128_210506	6/05/2021	Primary	ES2117036	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.14	0.06	0.47	<0.02	<0.02	0.22	0.12	<0.05	<0.02	<0.02	6.97	**5.67**	**3.56**	0.13	2.11
	1302_QC104_210506		Intralab Duplicate	ES2117036	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.14	0.06	0.46	<0.02	<0.02	0.22	0.12	<0.05	<0.02	<0.02	8.02	**6.74**	**4.64**	0.12	2.1
	1302_QC204_210506		Interlab Duplicate	RN1314391	<0.01	<0.01	0.023	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.18	0.057	<0.01	<0.01	<0.01	0.092	0.051	0.34	<0.01	<0.01	0.18	0.092	<0.02	<0.02	<0.01	6.33	**5.2**	**3.3**	0.11	1.9
MW133	1302_MW133_210506	6/05/2021	Primary	ES2117036	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.31	<0.1	0.04	<0.02	<0.02	0.35	0.11	1.09	<0.02	0.03	0.39	0.19	<0.05	<0.02	<0.02	17.6	**14.8**	**11.5**	0.27	3.33
MW139	1302_MW139_210506	6/05/2021	Primary	ES2117036	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.72	**0.66**	**0.44**	0.01	0.22
MW141	1302_MW141_210506	6/05/2021	Primary	ES2117036	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.3	**0.3**	**0.11**	<0.01	0.19
MW144	1302_MW144_210429	29/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.08	0.02	0.19	<0.02	<0.02	0.15	0.05	<0.05	<0.02	<0.02	4.37	**3.69**	**2.39**	0.05	1.3
MW148	1302_MW148_210506	6/05/2021	Primary	ES2117036	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.22	0.06	0.42	<0.02	<0.02	0.32	0.07	<0.05	<0.02	<0.02	7.82	**6.45**	**3.57**	0.12	2.88
MW156	1302_MW156_210429	29/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.1	0.02	0.24	<0.02	<0.02	0.13	0.05	<0.05	<0.02	<0.02	5.49	**4.78**	**3.46**	0.06	1.32
MW176	1302_MW176_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.08	**0.08**	**0.05**	<0.01	0.03
MW180	1302_MW180_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.07	**0.07**	**<0.01***	<0.01	0.07
MW185	1302_MW185_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.15	**0.15**	**0.06**	<0.01	0.09
MW191	1302_MW191_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.13	<0.02	<0.02	0.07	0.02	<0.05	<0.02	<0.02	2.25	**1.92**	**1.13**	0.03	0.79
MW193	1302_MW193_210506	6/05/2021	Primary	ES2117036	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.13	**0.13**	**0.1**	<0.01	0.03
MW194	1302_MW194_210506	6/05/2021	Primary	ES2117036	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.06	<0.02	0.18	<0.02	<0.02	0.08	0.03	<0.05	<0.02	<0.02	3.05	**2.6**	**1.83**	0.04	0.77
MW195	1302_MW195_210506	6/05/2021	Primary	ES2117036	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.09	**0.09**	**0.06**	<0.01	0.03
MW197	1302_MW197_210429	29/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	<0.1	<0.02	<0.02	<0.02	0.2	0.07	0.64	<0.02	<0.02	0.3	0.12	<0.05	<0.02	<0.02	10.6	**8.84**	**5.66**	0.15	3.18
MW200	1302_MW200_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.07	<0.02	<0.02	0.06	<0.02	<0.05	<0.02	<0.02	1.69	**1.46**	**0.89**	0.02	0.57
MW205	1302_MW205_210429	29/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	1.04	**0.91**	**0.51**	<0.01	0.4
MW209	1302_MW209_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.03	0.02	**0.02**	0.01	<0.02
MW210	1302_MW210_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	<0.1	<0.02	<0.02	<0.02	0.11	0.03	0.16	<0.02	<0.02	0.12	0.04	<0.05	<0.02	<0.02	5.01	**4.28**	**2.73**	0.06	1.55
MW211	1302_MW211_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.07	**0.07**	**0.04**	<0.01	0.03
MW215	1302_MW215_210506	6/05/2021	Primary	ES2117036	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.2	<0.1	<0.02	<0.02	<0.02	0.22	0.08	0.34	<0.02	<0.02	0.27	0.12	<0.05	<0.02	<0.02	9.13	**7.78**	**5.52**	0.12	2.26
MW240	1302_MW240_210429	29/04/2021	Primary	ES2116496	<0.05	<0.05	0.48	2.21	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.42	1.8	0.07	0.23	<0.02	0.94	4.06	8	1.23	0.05	1.14	3.01	<0.05	<0.02	0.04	67.2	**38.1**	**26.5**	**4.41**	11.6
MW241	1302_MW241_210429	29/04/2021	Primary	ES2116496	<0.05	<0.05	0.09	0.31	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.38	0.7	<0.02	0.04	<0.02	0.23	2.31	2.34	0.45	<0.02	0.37	3.79	<0.05	<0.02	<0.02	21.8	**9.2**	**6.26**	**1.62**	2.94
MW297	1302_MW297_210429	29/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	0.03	<0.02	<0.02	0.05	0.03	0.22	<0.02	<0.02	0.09	0.04	<0.05	<0.02	<0.02	4.19	**3.6**	**2.8**	0.05	0.8
MW303	1302_MW303_210429	29/04/2021	Primary	ES2116496	<0.05	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.95	1	<0.02	<0.02	<0.02	2.13	0.78	8	<0.02	<0.02	4.54	1.24	<0.05	<0.02	<0.02	73.9	**51.8**	**21.8**	**1.39**	30
	1302_QC103_210429		Intralab Duplicate	ES2116496	<0.05	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.89	1	<0.02	<0.02	<0.02	2.23	0.76	9.45	<0.02	<0.02	4.57	1.22	<0.05	<0.02	<0.02	85	**61.4**	**26.2**	**1.42**	35.2
	1302_QC203_210429		Intralab Duplicate	ES2116496	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.8	0.9	<0.02	<0.02	<0.02	2.2	0.74	9.44	<0.02	0.02	4.44	1.18	<0.05	<0.02	<0.02	87.9	**64.7**	**29.2**	**1.44**	35.5
MW422	1302_MW422_210506	6/05/2021	Primary	ES2117036	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.48	0.9	0.07	<0.02	<0.02	1.99	1	8.01	0.04	0.05	3.71	1.92	<0.05	<0.02	<0.02	97	**73.8**	**47.3**	**2.01**	26.5

Notes:
µg/L: micrograms per litre

17/06/2021
Checked By: [redacted]
Chcked Date: 17/06/2021

Table T3
Surface Water Field and Gauging Results
PFAS Ongoing Monitoring Program
Department of Defence- RAAF Darwin

Location ID	Sampled Date	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sample Method/Comments
SW101	29/04/2021	1.31	50.6	33	5.27	178.1	31.9	NA	Colourless/clear	No odour	Sampling Pole. Minimal flow
SW104	6/04/2021	2.22	69.5	45	6.81	259.4	29.0	NA	Colourless/clear	No odour	Sampling Pole. No observable flow
SW106	28/04/2021	3.30	63.2	41	6.37	167.3	29.5	No turbidity	Colourless/clear	No odour	Sampling Pole. Moderate flow
SW108	28/04/2021	3.99	61.2	40	5.78	217.8	27.8	No turbidity	Colourless/clear	No odour	Sampling Pole
SW109	28/04/2021	3.33	235.7	153	7.31	154.2	29.2	No turbidity	Colourless/clear	No odour	Sampling Pole. Moderate flow
SW112	28/04/2021	1.59	49282	32033	8.02	47.8	27.9	NA	Colourless/clear	Brackish	Sampling Pole
SW113	28/04/2021	3.21	71125	46231	7.64	160.7	28.7	Slightly turbid	Colourless/clear	Brackish	Sampling Pole. Swift flow
SW114	28/04/2021	5.36	86.2	56	6.30	190.9	31.2	No turbidity	Colourless/clear	No odour	Sampling Pole. Low flow
SW115	28/04/2021	1.13	113.3	74	6.00	153.0	32.0	NA	Colourless/clear	No odour	Sampling Pole. No observable flow
SW120	28/04/2021	2.68	71652	46574	8.09	102.6	27.7	No turbidity	Colourless/clear	Brackish	Sampling Pole
SW124	28/04/2021	3.09	71584	46530	7.84	97.0	28.3	No turbidity	Colourless/clear	Brackish	Sampling Pole
SW132	28/04/2021	4.26	71.7	47	5.63	129.5	27.9	No turbidity	Colourless/clear	No odour	Sampling Pole. Rapid flow
SW133	28/04/2021	4.59	28.4	18	5.91	128.2	29.4	Turbid	Brown	No odour	Sampling Pole. Rapid flow
SW143	28/04/2021	3.65	97.1	63	5.98	145.6	29.1	Turbid	Brown	No odour	Sampling Pole. Rapid flow
SW162	29/04/2021	2.58	48.6	32	5.62	127.4	32.8	NA	Colourless/clear	No odour	Sampling Pole. No observable flow
SW168	28/04/2021	3.65	67.6	44	5.83	203.2	32.2	No turbidity	Colourless/clear	No odour	Sampling Pole. Moderate flow
SW170	29/04/2021	3.02	68.8	45	5.57	171.3	32.2	NA	Colourless/clear	No odour	Sampling Pole. Minimal flow

Notes:
mbtoc: meters below top of casing
mAHD: meters Australian Height Datum
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
oC: degrees celcius
NA: not available

Table T4
Surface Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence- RAAF Darwin

AECOM

					PFAS Full Suite																												
					10:2 FTS	4:2 FTS	6:2 FtS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTeDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
					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
LOR					0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01	0.01	0.02
Ecological Receptors	**PFAS NEMP FW 99% Species Protection**																														**0.00023**	**19**	
Human Health	**PFAS NEMP Human Health Drinking Water**																													**0.07**		**0.56**	
Receptors	**NHMRC (2019) PFAS Recreational Water**																													**2**		**10**	
Location Code	**Field ID**	**Sample Date**	**Sample Type**	**Lab Report**																													
SW101	1302_SW101_210429	29/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.2	**0.18**	**0.13**	<0.01	0.05
SW104	1302_SW104_210506	6/05/2021	Primary	ES2117036	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.12	<0.02	<0.02	0.05	0.02	<0.05	<0.02	<0.02	1.98	**1.67**	**1.2**	0.03	0.47
SW106	1302_SW106_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.02	0.03	0.02	<0.05	<0.02	<0.02	0.88	**0.71**	**0.41**	0.02	0.3
SW108	1302_SW108_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.8	**0.67**	**0.4**	0.01	0.27
SW109	1302_SW109_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	0.93	**0.75**	**0.43**	0.02	0.32
	1302_QC101_210428		Intralab Duplicate	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	0.94	**0.77**	**0.44**	0.02	0.33
	1302_QC201_210428		Interlab Duplicate	RN1314232	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.032	<0.05	<0.01	<0.01	<0.01	0.011	<0.01	0.06	0.013	<0.01	0.031	<0.02	<0.02	<0.02	<0.01	0.882	**0.7**	**0.43**	0.017	0.27
SW112	1302_SW112_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.09	**0.09**	**0.04**	<0.01	0.05
SW113	1302_SW113_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	**<0.01***	<0.01	<0.02
SW114	1302_SW114_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.2	<0.02	<0.02	0.04	0.03	<0.05	<0.02	<0.02	2.12	**1.71**	**1.26**	0.03	0.45
SW115	1302_SW115_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.02	0.02	**0.02**	<0.01	<0.02
SW120	1302_SW120_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.04	0.04	**0.02**	<0.01	0.02
SW124	1302_SW124_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	**<0.01***	<0.01	<0.02
	1302_QC100_210428		Intralab Duplicate	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	**<0.01***	<0.01	<0.02
	1302_QC200_210428		Interlab Duplicate	RN1314232	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	<0.01	<0.01	**<0.02***	<0.01	<0.01
SW132	1302_SW132_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.16	**0.16**	**0.09**	<0.01	0.07
SW133	1302_SW133_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	**<0.01***	<0.01	<0.02
SW143	1302_SW143_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	**<0.01***	<0.01	<0.02
SW162	1302_SW162_210429	29/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.02	0.02	**0.02**	<0.01	<0.02
SW168	1302_SW168_210428	28/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.03	0.03	0.23	<0.02	<0.02	0.08	0.05	<0.05	<0.02	<0.02	1.87	**1.33**	**0.72**	0.05	0.61
SW170	1302_SW170_210429	29/04/2021	Primary	ES2116496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.26	**0.23**	**0.17**	<0.01	0.06

Notes:
µg/L: micrograms per litre
* LOR is above guideline value
Denotes first time detection above LOR for Sum of PFHxS+PFOS or PFOA
Denotes new exceedance of human health screening criteria

17/06/2021
Checked By: [redacted]
Chcked Date: 17/06/2021

Appendix C

Sampling Logs

Appendix C Sampling Logs

GROUNDWATER SAMPLING FIELD RECORD

AECOM

Project Name: PFAS OMP
Client: Department of Defence
Project Location: RAAF Base Darwin
Project Number: 60612561
Project Manager: [redacted]

Sampling Round: April/2021
Fieldwork Staff: [redacted]
Chem Kit Serial No.: [redacted]
Parameter Method: WSI
Date: 28-4-21

Site	Date	Time	Depth to GW	Well Depth (mbtoc)	Colour	Odour	pH	Temp (°C)	E.C. (mS/cm or µS/cm)	DO (ppm or mg/L)	Redox (mV)	Turbidity	Observations: Odour, Colour, Turbidity	Field QAQC
SW124	28-4-21	0735	NA	NA	clear	brackish	7.84	28.3	71584	3.09	97.0	NA	clear brackish waters	D/T
SW120	28-4-21	0810	NA	NA	clear	brackish	8.09	27.7	71652	2.68	102.6		clear brackish water	
SW113	28-4-21	0915	NA	NA	clear	brackish	7.64	28.7	71125	3.21	160.7		slightly turbid, swift moving	
SW112	28-4-21	0925	NA	NA	clear	none	8.02	27.9	49287	1.59	47.8			
~~MW195~~	~~28-4-21~~	~~0945~~	~~DRY~~											
MW185	28-4-21	1015	2.124	10.53	red	none	7.77	31.3	1936	0.71	159.3		very turbid	
SW109	28-4-21	1035	NA	NA	clear	none	7.81	29.2	235.7	3.33	154.2		moderate flow	D/T
MW191 ~~MW184~~	28-4-21	1105	3.29	12.73	brown	none	5.97	33.0	98.6	2.43	213.0		turbid	
~~MW189~~	~~28-4-21~~													
SW168	28-4-21	1130	NA	NA	clear	none	5.83	32.2	67.6	3.65	203.2		moderate flow	
SW108	28-4-21	1145	NA	NA	clear	none	5.78	27.8	61.2	3.99	217.8			
~~MW193~~	~~28-4-21~~	~~1200~~												
~~MW195~~	~~28-4-21~~	~~1250~~												
SW114	28-4-21	1300	NA	NA	clear	none	6.30	31.2	86.2	5.36	190.9		low flow	
SW115	28-4-21	1315	NA	NA	clear	none	6.00	32.0	113.3	1.13	153.0		no visable flow	
SW106	28-4-21	1335	NA	NA	clear	none	6.37	29.5	63.2	3.30	167.3		moderate flow	
SW132	28-4-21	1440	NA	NA	clear	none	5.63	27.9	71.7	4.26	129.5		rapid flow	
SW133	28-4-21	1455	NA	NA	turbid	none	5.91	29.4	28.4	4.59	128.2		Brown, rapid flow	
SW143	28-4-21	1515	NA	NA	Brown	none	5.98	29.1	97.1	3.65	145.6		Turbid, rapid flow	
MW180	28-4-21	1535	7.097	15.014	Brown		9.19	31.9	77.0	3.51	244.0		Turbid	

GROUNDWATER SAMPLING FIELD RECORD

Project Name: PFAS OMP
Client: Department of Defence
Project Location: RAAF Base Darwin
Project Number: 60612561
Project Manager: [redacted]

Sampling Round: APH 2021
Fieldwork Staff: [redacted]
Chem Kit Serial No.: NA
Parameter Method: YSI
Date: 29-4-21

AECOM

Site	Date	Time	Depth to GW	Well Depth (mbtoc)	Colour	Odour	pH	Temp (°C)	E.C. (mS/cm or µS/cm)	DO (ppm or mg/L)	Redox (mV)	Turbidity	Observations: Odour, Colour, Turbidity	Field QAQC
MW211	28/4/21	1545	4.674	11.85	brown	none	5.83	31.1	336.0	1.85	187.1	NA	Turbid	
MW200	28/4/21	1600	5.40	19.691	grey	organic	5.52	30.1	97.7	0.86	187.7		turbid	
MW176	28/4/21	1610	3.774	11.69	brown	none	5.66	30.3	92.9	0.87	116.4		turbid	
MW209	28/4/21	1630	1.384	14.91	brown	H_2S	5.78	30.3	970	0.74	14.0		turbid	
MW210	28/4/21	1645	2.340	12.01	brown	H_2S	6.13	31.1	289.6	0.71	6.4		turbid	
MW115	29/4/21	0942	5.12	6.081	brown	none	7.28	31.0	45.5	3.21	164.4		turbid	
MW205	29/4/21	0955	4.445	14.84	red/brown	none	6.08	30.9	37.5	3.65	183.8		turbid	
MW112	29/4/21	1028	5.143	14.11	red/brown	none	5.81	32.1	42.6	1.69	207.3		turbid	
SW170	29/4/21	1044	NA	NA	clear	none	5.57	32.2	68.8	3.02	171.3		minimal flow	
SW101	29/4/21	1100	NA	NA	clear	none	5.27	31.9	50.6	1.31	178.1		minimal flow	
MW156	29/4/21	1129	2.502	12.6	clear	organic	5.01	30.2	67.2	1.10	74.7		Probe pulled @ 1135 / Sediment in well	
MW197	29/4/21	1151	6.085	16.04	brown	none	4.89	31.0	68.3	0.49	116.0		turbid	
MW240	29/4/21	1205	4.335	14.44	clear	none	5.30	33.1	96.7	1.40	97.0		coffee grounds w/ sleeves	
MW241	29/4/21	1223	3.723	14.445	grey	none	4.51	32.9	49.7	1.98	213.1		turbid	
MW107	29/4/21	1310	4.125	15.36	grey	organic	5.29	31.9	140.5	1.05	8.5		turbid	
MW103	29/4/21	1322	4.201	12.62	tan	none	5.26	32.3	97.8	0.63	128.0		roots; turbid concrete around well, damaged, Well fine	D/T
SW162	29/4/21	1350	NA	NA	clear	none	5.62	32.8	48.6	2.58	127.4		no usable flow	
MW144	29/4/21	1415	8.434	15.76	clear	none	5.10	32.3	43.6	2.43	241.2			
MW303	29/4/21	1445	8.428	15.53	clear	hydrocarbon	5.53	33.1	333.4	0.36	-62.9			D/T
~~MW133~~	~~29/4/21~~	~~1500~~												

GROUNDWATER SAMPLING FIELD RECORD

Project Name: PFAS OMP
Client: Department of Defence
Project Location: RAAF Base Darwin
Project Number: 60612561
Project Manager: [redacted]

Sampling Round: April 2021
Fieldwork Staff: [redacted]
Chem Kit Serial No.: NA
Parameter Method: YSI
Date: 6-5-21

AECOM

Site	Date	Time	Depth to GW	Well Depth (mbtoc)	Colour	Odour	pH	Temp (°C)	E.C. (mS/cm or µS/cm)	DO (ppm or mg/L)	Redox (mV)	Turbidity	Observations: Odour, Colour, Turbidity	Field QAQC
~~SW181~~												NA		
MW297	29-4-21	1325	6.638	15.21	clear	hydrocarbon	4.53	32.1	59.7	0.65	182.1			
MW194	6/5/21	0830	1.74	—	clear	HS_2	7.62	27.7	60.2	0.98	164.5			
MW195	6/5/21	08:56	1.61	—	cloudy	organic	5.92	27.6	42.2	1.05			brown/light brown w sediment	
SW104	~~6/5/21~~	09:17	—	—	clear	NA	6.81	29.0	69.5	2.22	259.4		no observable flow	
MW193	as above	09:40	2.67	—	turbid	~~HC~~	6.79	30.5	53.8	1.67	232.8		Brown.	
MW422	as above	10:22	3.22	—	clear	NA	5.83	31.8	44.2	2.88	259.9		light grey	
MW139	as above	10:35	3.82	—	turbid	NA	5.25	31.3	46.9	1.92	280.7		light grey/brown.	
MW141	as above	10:57	6.64	—	clearing	NA	5.69	30.1	64.5	0.73	236.1		light grey/white turbid	
MW133	as above	11:17	7.03	—	clear	HC!!	5.90	32.7	64.7	1.64	92.0		colourless.	QC104 QC204
MW128	as above	12:02	2.22	—	light grey brown	NA	4.67	31.7	69.6	0.83	223.4		clearing slightly turbid	
MW148	as above	12:36	2.91	—	orange	HS_2	5.18	33.1	92.7	0.79	108.7		particulate floaters	

Appendix D

Data Validation Report

Appendix D Data Validation Report

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DATA VALIDATION REPORT - GROUNDWATER

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:** 31/05/2021	[redacted]
Site:	1302 – RAAF Base Darwin		
Matrix:	Water	**Data Verified by:**	[redacted]
Laboratory:	ALS; NMI	**Date:** 08/06/2021	[redacted]
Lab reference:	ES2117036; ES2116496; RN1314391; RN1314232		

Key Findings:

The groundwater analytical data can be used as a basis for interpretation, subject to the limitations outlined below:

- Elevated RPDs should be taken into consideration when using data for PFHxS, PFPeS, PFHxA, PFHpS, PFBS and Sum of PFAS quantitatively.
- Elevated RPDs should be taken into consideration when interpreting data for PFOA, PFOS and Sum of PFHxS and PFOS where close to guidelines.
  The potential exists for concentrations of PFOS to be below the LOR, but above the adopted freshwater species protection guideline in sample MW180 and should be taken into consideration when interpreting results.

Component		Outliers			Material impact on interpretation
		No	Yes	Comment	
Frequency of field quality assurance/quality control (QAQC)			✓	1	No
Number of tests requested/reported		✓			
Sample handling/preservation/holding times			✓	2	No
Frequency of laboratory QA/QC			✓	3	No
Limits of reporting (LOR)			✓	4	No
Blank analysis	Field blank	✓			
	Rinsate blank		✓	5	No
	Trip blank	✓			
	Method blank	✓			
Field intra-laboratory relative percent differences (RPDs)			✓	6	No
Field inter-laboratory RPDs			✓	7	No
Laboratory duplicate RPDs		✓			
Matrix spike (MS) % recoveries		✓			
Laboratory control spike (LCS) % recoveries		✓			
Surrogate % recoveries		✓			
Other observations			✓	8	No

1 of 3

Comments	
1. Frequency of field QA/QC	Field intra- and inter-laboratory duplicate samples are required at a rate of one per ten primary samples for the sampling program for assessment of results against the PFAS National Environmental Management Plan (NEMP) 2020. Four intra-lab and two inter-lab duplicate samples were analysed out of a required three. For further comment of the precision of the data please see **Sections 6** and **7**.
2. Sample handling/ preservation/ holding times	**Handling/preservation** Sample receipt temperature (6.4°C) was marginally outside of the recommended range (≤6°C) in primary batch ES2117036. Samples in primary batch ES2116496 were received at an acceptable temperature (2 °C). The inter-laboratory samples were received at the secondary laboratory chilled in batches RN1314232 and RN1314391. As the samples were received only marginally outside of the specified temperature range in batch ES2117036, and the samples were immediately cooled upon collection, the potential for under reporting is not considered to materially affect the interpretation of results.
3. Frequency of Laboratory QA/QC	Laboratory duplicate samples were not reported for PFAS in ES2117036.. For further comment of the precision of the data please see **Sections 6** and **7**. Matrix spikes were not reported in lab batch EM2117036 and were not reported at the required frequencies for PFAS in ES2116496. The accuracy of the data can be assessed as acceptable based on method blanks, LCS and surrogate spike recoveries (which were reported at or above the required frequencies and within control limits), and available matrix spike recoveries for the same analytical method group in ES2117036 (which were reported within control limits).
4. Limits of reporting	Limits of reporting were sufficiently low to enable assessment against adopted guideline criteria, with the exception of PFOS. The potential exists for concentrations of key COPC PFOS to be above the adopted freshwater species protection guideline, but below the laboratory LOR for sample MW180. This should be taken into consideration when interpreting data and using data quantitatively.
5. Rinsate blank	As per project specifications, rinsate blank samples were not analysed at a frequency of one per day per piece of equipment. One rinsate sample (QC300), collected from the interface probe, was analysed over the three days of sampling. However, the decontamination methods are assessed as acceptable and the potential for cross contamination via sampling methods is considered unlikely based on the following: A. All sampling equipment was either dedicated, disposable or decontaminated with a solution of water and Liquinox between sampling locations B. Concentrations of all analytes were reported below the LOR in the rinsate sample analysed C. Laboratory results are consistent with historical observations and no evidence of cross contamination is apparent.

2 of 3

6. Field intra-laboratory duplicate RPDs	Field intra-laboratory duplicate RPDs were reported within control limits, with the exception of the following analytes (as shown in the RPD table): • PFOA (34%) • PFOS (38%) • PFHxS (34%) • PFPeS (35%) • PFHxA (33%) • PFHpS (39%) • PFBS (30%) • Sum of PFHxS and PFOS (36%) • Sum of PFAS (36%) As there are no adopted guideline values for PFHxS, PFPeS, PFHxA, PFHpS, PFBS and Sum of PFAS the elevated RPDs are not expected to affect interpretation of results against guidelines. However, the elevated RPDs should be taken into consideration when using the data quantitatively. This apparent lack of precision should be taken into consideration when interpreting concentrations for PFOA, PFOS and Sum of PFHxS and PFOS close to guidelines.
7. Field inter-laboratory duplicate RPDs	Field inter-laboratory duplicate RPDs were reported within control limits, with the exception of the following analytes (as shown in the RPD table): • PFHxS (41%) • PFHpS (46%) • PFHxA (32%) As there are no adopted guideline values for PFHxS, PFHpS and PFHxA the elevated RPDs are not expected to affect interpretation of results against guidelines. However, the elevated RPDs should be taken into consideration when using the data quantitatively.
8. Other comments	**General Comments** ALS laboratory noted the following in lab batch ES2116496: EP231X: PFAS results for sample 1302_MW180_210428 confirmed by re-extraction and re-analysis.

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DATA VALIDATION REPORT – SURFACE WATER

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:** 31/05/2021	[redacted]
Site:	1302 – RAAF Base Darwin		
Matrix:	Water	**Data Verified by:**	[redacted]
Laboratory:	ALS; NMI	**Date:** 08/06/2021	[redacted]
Lab reference:	ES2117036; ES2116496; RN1314391; RN1314232		

Key Findings:

The surface water analytical data can be used as a basis for interpretation, subject to the limitations outlined below:

- The potential exists for concentrations of PFOS to be below the LOR, but above the adopted freshwater species protection guideline in samples SW113, SW124 and associated duplicate samples QC100 and QC200, SW133 and SW143 and should be taken into consideration when interpreting results.

Component		Outliers			Material impact on interpretation
		No	Yes	Comment	
Frequency of field quality assurance/quality control (QAQC)		✓			
Number of tests requested/reported		✓			
Sample handling/preservation/holding times			✓	1	No
Frequency of laboratory QA/QC			✓	2	No
Limits of reporting (LOR)		✓	✓	3	No
Blank analysis	Field blank	✓			
	Rinsate blank		✓	4	No
	Trip blank	✓			
	Method blank	✓			
Field intra-laboratory relative percent differences (RPDs)		✓			
Field inter-laboratory RPDs		✓			
Laboratory duplicate RPDs		✓			
Matrix spike (MS) % recoveries		✓			
Laboratory control spike (LCS) % recoveries		✓			
Surrogate % recoveries		✓			
Other observations			✓	5	No

1 of 2

Comments	
1. Sample handling/ preservation/ holding times	**Handling/preservation** Sample receipt temperature (6.4°C) was marginally outside of the recommended range (≤6°C) in primary batch ES2117036. Samples in primary batch ES2116496 were received at an acceptable temperature (2 °C). The inter-laboratory samples were received at the secondary laboratory chilled in batch RN1314232. As the samples were received only marginally outside of the specified temperature range in batch ES2117036, and the samples were immediately cooled upon collection, the potential for under reporting is not considered to materially affect the interpretation of results.
2. Frequency of laboratory QA/QC	Laboratory duplicate samples were not reported for PFAS in ES2117036. The precision of the data can be assessed as acceptable based on intra- and inter-laboratory duplicate RPDs which were reported at the required frequencies and within control limits. Matrix spikes were not reported in lab batch EM2117036 and were not reported at the required frequencies for PFAS in ES2116496. The accuracy of the data can be assessed as acceptable based on method blanks, LCS and surrogate spike recoveries (which were reported at or above the required frequencies and within control limits), and available matrix spike recoveries for the same analytical method group in ES2117036 (which were reported within control limits).
3. Limits of reporting	Limits of reporting were sufficiently low to enable assessment against adopted guideline criteria, with the exception of PFOS. The potential exists for concentrations of key COPC PFOS to be above the adopted freshwater species protection guideline, but below the laboratory LOR. This should be taken into consideration when interpreting data and using data quantitatively.
4. Rinsate blank	As per project specifications, rinsate blank samples were not analysed at a frequency of one per day per piece of equipment. One rinsate sample (QC300), collected from the interface probe, was analysed over the three days of sampling. However, the decontamination methods are assessed as acceptable and the potential for cross contamination via sampling methods is considered unlikely based on the following: A. All sampling equipment was either dedicated, disposable or decontaminated with a solution of water and Liquinox between sampling locations B. Concentrations of all analytes were reported below the LOR in the rinsate sample analysed C. Laboratory results are consistent with historical observations and no evidence of cross contamination is apparent.
5. Other comments	**General Comments** ALS laboratory noted the following in lab batch ES2117036: • Amendment (31/05/2021): This report has been amended as a result of a request to change sample identification numbers (IDs) received from AECOM on 31/05/2021, for samples ES2117036-012. All analysis results are as per the previous report.

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Table T5
QAQC Blank Sample Analysis
PFAS OMP
Department of Defence - RAAF Base Darwin

AECOM

Lab Report Number	ES2116496	ES2116496	ES2116496	ES2116496
Field ID	1302_QC400_210428	1302_QC300_210428	1302_QC501_210429	1302_QC500_210428
Sampled Date	28/04/2021	28/04/2021	29/04/2021	28/04/2021
Sample Type	Field Blank	Rinsate	Trip Blank	Trip Blank

Analyte	**Units**	**LOR**				
PFAS Full Suite						
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer sulfonic acid (6:2 FTS)_0	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01

	Lab Report Number	ES2116496	ES2116496		ES2116496	RN1314232		ES2116496	ES2116496		ES2116496	ES2116496	
	Field ID	1302 MW103 210429	1302 QC102 210429	RPD	1302 MW103 210429	1302 QC202 210429	RPD	1302 MW303 210429	1302 QC103 210429	RPD	1302 MW303 210429	1302 QC203 210429	RPD
	Sampled Date	29/04/2021	29/04/2021		29/04/2021	29/04/2021		29/04/2021	29/04/2021		29/04/2021	29/04/2021	
	Sample Type	Primary	Intra-Lab Duplicate		Primary	Inter-Lab Duplicate		Primary	Intra-Lab Duplicate		Primary	Intra-Lab Duplicate	
Analyte	**Units**	**LOR**											
PFAS Full Suite													
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	**0.44**	**0.62**	**34**	0.44	0.4	10	1.39	1.42	2	1.39	1.44	4
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	**17.3**	**25.3**	**38**	17.3	15	14	21.8	26.2	18	21.8	29.2	29
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02 : 0.01 (Interlab)	**10.6**	**15**	**34**	**10.6**	**7**	**41**	30	35.2	16	30	35.5	17
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS) 0	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	0.08	0.08	0	0.08	0.07	13
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.05	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	**0.79**	**1.12**	**35**	0.79	0.6	27	4.54	4.57	1	4.54	4.44	2
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	0.26	0.36	32	0.26	0.24	8	1.24	1.22	2	1.24	1.18	5
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	0.012	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	**1.61**	**2.24**	**33**	1.61	1.2	29	8	9.45	17	8	9.44	17
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	**0.48**	**0.71**	**39**	**0.48**	**0.3**	**46**	2.13	2.23	5	2.13	2.2	3
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	0.19	0.26	31	0.19	0.16	17	0.78	0.76	3	0.78	0.74	5
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	**0.39**	**0.53**	**30**	0.39	0.43	10	2.95	2.89	2	2.95	2.8	5
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	0.1	0	<0.1	0.11	10	1	1	0	1	0.9	11
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<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	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<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	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	0.02	0.03	40	0.02	<0.01	67	<0.02	<0.02	0	<0.02	0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0
Sum of PFHxS and PFOS	µg/L	0.01	**27.9**	**40.3**	**36**	27.9	22	23	51.8	61.4	17	51.8	64.7	22
Sum of PFAS	µg/L	0.01	**32.1**	**46.3**	**36**	32.1	25.44	23	73.9	85	14	73.9	87.9	17

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

	Lab Report Number	ES2117036	ES2117036			ES2117036	RN1314391		
	Field ID	1302_MW128_210506	1302_QC104_210506	**RPD**		1302 MW128 210506	1302 QC204 210506	**RPD**	
	Sampled Date	6/05/2021	6/05/2021			6/05/2021	6/05/2021		
	Sample Type	Primary	Intra-Lab Duplicate			Primary	Inter-Lab Duplicate		
Analyte		**Units**	**LOR**						
PFAS Full Suite									
	Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.13	0.12	8	0.13	0.11	17
	Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	3.56	4.64	26	3.56	3.3	8
	Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02 : 0.01 (Interlab)	2.11	2.1	0	2.11	1.9	10
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0
	6:2 Fluorotelomer sulfonic acid (6:2 FTS) 0	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	0.023	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0
	Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
	Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0
	Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.22	0.22	0	0.22	0.18	20
	Perfluoropentanoic acid (PFPeA)	µg/L	0.02	0.12	0.12	0	0.12	0.092	26
	Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.47	0.46	2	**0.47**	**0.34**	**32**
	Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	0.14	0.14	0	0.14	0.092	41
	Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	0.06	0.06	0	0.06	0.051	16
	Perfluorodecane sulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.16	0.16	0	0.16	0.18	12
	Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	0.057	0
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0
	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0
	Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0
	Sum of PFHxS and PFOS	µg/L	0.01	5.67	6.74	17	5.67	5.2	8
	Sum of PFAS	µg/L	0.01	6.97	8.02	14	6.97	6.325	10

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

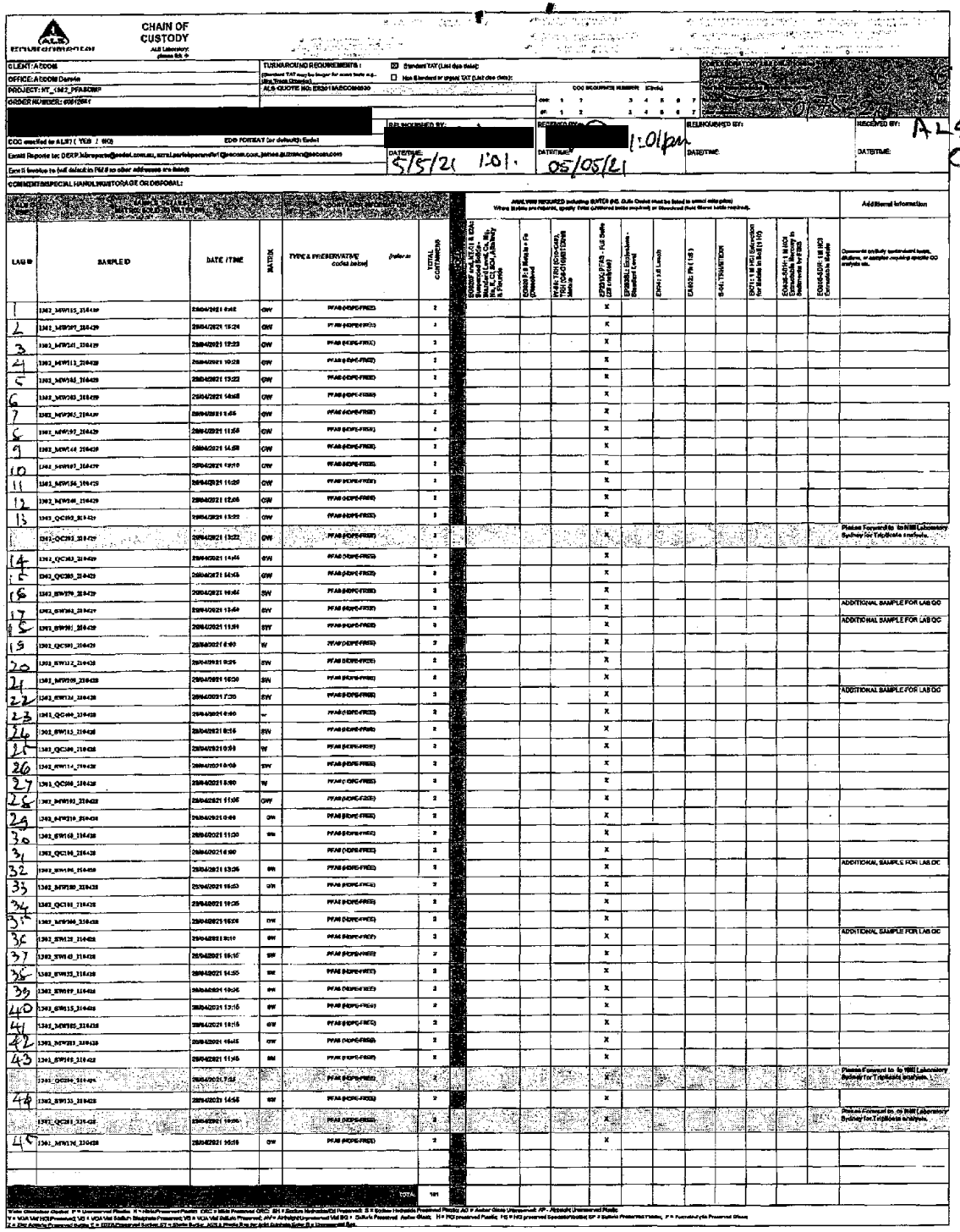
		Lab Report Number	ES2116496	ES2116496		ES2116496	RN1314232		ES2116496	ES2116496		ES2116496	RN1314232	
		Field ID	1302 SW124 210428	1302 QC100 210428	**RPD**	1302 SW124 210428	1302 QC200 210428	**RPD**	1302 SW109 210428	1302 QC101 210428	**RPD**	1302 SW109 210428	1302 QC201 210428	**RPD**
		Sampled Date	28/04/2021	28/04/2021		28/04/2021	28/04/2021		28/04/2021	28/04/2021		28/04/2021	28/04/2021	
		Sample Type	Primary	Intra-Lab Duplicate		Primary	Inter-Lab Duplicate		Primary	Intra-Lab Duplicate		Primary	Inter-Lab Duplicate	
Analyte	**Units**	**LOR**												
PFAS Full Suite														
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.02	0.02	0	0.02	0.017	16
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.02	0	0.43	0.44	2	0.43	0.43	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	0.32	0.33	3	0.32	0.27	17
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<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) 0	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<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 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<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	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	0.04	0.04	0	0.04	0.031	25
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	0.013	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	0.08	0.08	0	0.08	0.06	29
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	0.011	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<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 (Interlab)	<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 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	0.04	0.03	29	0.04	0.032	22
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<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
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<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
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.75	0.77	3	0.75	0.7	6
Sum of PFAS	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.93	0.94	1	0.93	0.882	5

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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 E

Chain of Custody

Appendix E Chain of Custody



CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: AECOM

OFFICE: AECOM Darwin

PROJECT: NT_1342_PFASDMP

ORDER NUMBER: 60612841

[redacted]

COC emailed to ALS? (YES / NO)

EDD FORMAT (or default): Excel

Email Reports to: DERP.labreports@aecom.com.au, anna.lawlor@aecom.com; james.gutzman@aecom.com

Email Invoice to (will default to PM if no other addresses are listed):

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

TURNAROUND REQUIREMENTS: ☑ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO: ERSH18ADCOM0530

COC SEQUENCE NUMBER (Circle): 1 2 3 4 5 6 7 / 1 2 3 4 5 6 7

RELINQUISHED BY: [redacted] DATE/TIME: 5/5/21 1201.

RECEIVED BY: [redacted] DATE/TIME: 05/05/21 1:01pm

RELINQUISHED BY: DATE/TIME:

RECEIVED BY: ALS syd 06/05/21 5:15pm DATE/TIME:

LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	ANALYSIS REQUIRED including SURROGATES (SE, SW) and SAMPLE VOLUMES (WE, WW)	Additional Information
1	1342_MW115_210429	28/04/2021 0:00	GW	PFAS (HDPE-FREE)	2	X	
2	1342_MW107_210429	28/04/2021 10:24	GW	PFAS (HDPE-FREE)	2	X	
3	1342_MW141_210429	28/04/2021 12:23	GW	PFAS (HDPE-FREE)	2	X	
4	1342_MW113_210429	28/04/2021 10:28	GW	PFAS (HDPE-FREE)	2	X	
5	1342_MW148_210429	28/04/2021 13:22	GW	PFAS (HDPE-FREE)	2	X	
6	1342_MW103_210429	28/04/2021 14:58	GW	PFAS (HDPE-FREE)	2	X	
7	1342_MW105_210429	28/04/2021 11:45	GW	PFAS (HDPE-FREE)	2	X	
8	1342_MW107_210429	28/04/2021 11:58	GW	PFAS (HDPE-FREE)	2	X	
9	1342_MW144_210429	28/04/2021 14:58	GW	PFAS (HDPE-FREE)	2	X	
10	1342_MW107_210429	28/04/2021 12:10	GW	PFAS (HDPE-FREE)	2	X	
11	1342_MW154_210429	28/04/2021 11:20	GW	PFAS (HDPE-FREE)	2	X	
12	1342_MW146_210429	28/04/2021 12:55	GW	PFAS (HDPE-FREE)	2	X	
13	1342_QC103_210429	28/04/2021 13:22	GW	PFAS (HDPE-FREE)	2	X	
11	1342_QC102_210429	28/04/2021 13:22	GW	PFAS (HDPE-FREE)	2	X	Please Forward to ALS NSW Laboratory Sydney for Trip Blank analysis.
14	1342_QC103_210429	28/04/2021 14:44	GW	PFAS (HDPE-FREE)	2	X	
15	1342_QC205_210429	28/04/2021 14:45	GW	PFAS (HDPE-FREE)	2	X	
16	1342_SW109_210429	28/04/2021 10:44	SW	PFAS (HDPE-FREE)	2	X	
17	1342_SW103_210429	28/04/2021 13:49	SW	PFAS (HDPE-FREE)	2	X	ADDITIONAL SAMPLE FOR LAB QC
15	1342_SW101_210429	28/04/2021 11:51	SW	PFAS (HDPE-FREE)	2	X	ADDITIONAL SAMPLE FOR LAB QC
19	1342_QC101_210429	28/04/2021 0:00	W	PFAS (HDPE-FREE)	2	X	
20	1342_SW112_210429	28/04/2021 9:25	SW	PFAS (HDPE-FREE)	2	X	
21	1342_MW109_210429	28/04/2021 10:30	SW	PFAS (HDPE-FREE)	2	X	
22	1342_SW124_210429	28/04/2021 7:35	SW	PFAS (HDPE-FREE)	2	X	ADDITIONAL SAMPLE FOR LAB QC
23	1342_QC104_210429	28/04/2021 0:00	W	PFAS (HDPE-FREE)	2	X	
24	1342_SW113_210429	28/04/2021 9:15	SW	PFAS (HDPE-FREE)	2	X	
25	1342_QC105_210429	28/04/2021 0:00	W	PFAS (HDPE-FREE)	2	X	
26	1342_SW114_210429	28/04/2021 0:00	SW	PFAS (HDPE-FREE)	2	X	
27	1342_QC106_210429	28/04/2021 0:00	W	PFAS (HDPE-FREE)	2	X	
28	1342_MW102_210429	28/04/2021 11:05	GW	PFAS (HDPE-FREE)	2	X	
29	1342_MW110_210429	28/04/2021 0:00	GW	PFAS (HDPE-FREE)	2	X	
30	1342_SW102_210429	28/04/2021 11:20	SW	PFAS (HDPE-FREE)	2	X	
31	1342_QC104_210429	28/04/2021 0:00		PFAS (HDPE-FREE)	2	X	
32	1342_SW106_210429	28/04/2021 13:35	SW	PFAS (HDPE-FREE)	2	X	ADDITIONAL SAMPLE FOR LAB QC
33	1342_MW108_210429	28/04/2021 10:53	GW	PFAS (HDPE-FREE)	2	X	
34	1342_QC104_210429	28/04/2021 10:35		PFAS (HDPE-FREE)	2	X	
35	1342_MW106_210429	28/04/2021 10:00	GW	PFAS (HDPE-FREE)	2	X	
36	1342_SW128_210429	28/04/2021 0:00	SW	PFAS (HDPE-FREE)	2	X	ADDITIONAL SAMPLE FOR LAB QC
37	1342_SW104_210429	28/04/2021 10:10	SW	PFAS (HDPE-FREE)	2	X	
38	1342_SW132_210429	28/04/2021 14:55	SW	PFAS (HDPE-FREE)	2	X	
39	1342_SW109_210429	28/04/2021 10:25	SW	PFAS (HDPE-FREE)	2	X	
40	1342_SW115_210429	28/04/2021 13:10	SW	PFAS (HDPE-FREE)	2	X	
41	1342_MW105_210429	28/04/2021 11:15	GW	PFAS (HDPE-FREE)	2	X	
42	1342_MW103_210429	28/04/2021 10:45	GW	PFAS (HDPE-FREE)	2	X	
43	1342_SW105_210429	28/04/2021 11:45	SW	PFAS (HDPE-FREE)	2	X	
	1342_QC204_210429	28/04/2021 7:55		PFAS (HDPE-FREE)	2	X	Please Forward to ALS NSW Laboratory Sydney for Trip Blank analysis.
44	1342_SW133_210429	28/04/2021 14:55	SW	PFAS (HDPE-FREE)	2	X	
	1342_QC201_210429	28/04/2021 10:05		PFAS (HDPE-FREE)	2	X	Please Forward to ALS NSW Laboratory Sydney for Trip Blank analysis.
45	1342_MW134_210429	28/04/2021 10:55	GW	PFAS (HDPE-FREE)	2	X	
				TOTAL	101		

Subcon / Forward Lab / Split WO: [redacted]

Lab / Analysis: ---

Organised By / Date: ---

Relinquished By / Date: QC 230 ---

Connote / Courier: ---- QC 22147 Q c 202

WO No: ES2116496 ----------

Attach By PO / Internal Sheet: ----

Environmental Division
Sydney
Work Order Reference
ES2116496

Telephone : +61-2-8784 8555

LAB OF ORIGIN: DARWIN

PFAS: 1302 - RAAF Dr

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 2 Byth Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 1/29 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Road Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☐SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townesville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: DEPT. DEFENCE

OFFICE: DARWIN

PROJECT: NT_1302_PFASOMP PROJECT NO.: 60612576

ORDER NUMBER: PURCHASE ORDER NO.:

[redacted]

COC Emailed to ALS? (YES / NO) EDD FORMAT (or default):

Email Reports to (will default to PM if no other addresses are [redacted]

Email Invoice to (will default to PM if no other addresses are [redacted]

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSA [redacted]

TURNAROUND REQUIREMENTS : ☐ Standard TAT (List due date):
(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.: ES2019AECOMAU0030

COUNTRY OF ORIGIN: AUST

COC SEQUENCE NUMBER (Circle)

COC:	1	2	3	4	5	6	7
OF:	1	2	3	4	5	6	7

FOR 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 comment: 0.25 6A

RELINQUISHED BY: [redacted] DATE/TIME: 6/5/21

RECEIVED BY: [redacted] DATE/TIME: 3:00pm 06/05/21

RELINQUISHED BY: DATE/TIME:

RECEIVED BY: ALS Sydney DATE/TIME: 07/05/21 1pm

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	PFAS FULL SUITE (28 ANALYTES) EP231X	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	1302_MW215_210506	6/5/21 14:20	GW	PFAS (HDPE FREE)	2		
2	1302_MW122_210506	6/5/21 10:24	GW				
3	1302_MW139_210506	6/5/21 10:35					
4	1302_MW195_210506	6/5/21 8:56					
5	1302_MW194_210506	6/5/21 8:30					
6	1302_MW148_210506	6/5/21 12:36					
7	1302_MW141_210506	6/5/21 10:57					
8	1302_MW128_210506	6/5/21 12:07					
9	1302_QC104_210506	6/5/21 12:07					
	1302_QC204_210506	6/5/21 12:07				# FORWARD TO NMI LABS SYDNEY	
10	1302_MW193_210506	6/5/21 09:40					
11	1302_MW133_210506	6/5/21 11:16					
12	1302_SW104_210506	6/5/21 9:17			TOTAL 26		

Environmental Division Sydney
Work Order Reference
ES2117036

Telephone : +61-2-8784 8555

LAB OF ORIGIN: DARWIN

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

Appendix F

Laboratory Reports

Appendix F Laboratory Reports

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **ES2116496**		
Amendment	: **1**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: GPO BOX 3175 DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: NT_1302_PFASOMP	Page	: 1 of 3
Order number	: 60612561	Quote number	: ES2019AECOMAU0030 (SY/139/19 V3)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: [redacted]		

Dates

Date Samples Received	: 06-May-2021 16:45	Issue Date	: 28-May-2021
Client Requested Due Date	: 14-May-2021	Scheduled Reporting Date	: **14-May-2021**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: 2.0' C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 45 / 45

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
- **Samples QC202, QC200 and QC201 have been forwarded to NMI Lab Sydney as per COC requested.**
- **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 absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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.

ES2116496-011 : 29-Apr-2021 11:29 : 1302_MW156_210429 - 1302_MW176_210429

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)
ES2116496-001	29-Apr-2021 09:42	1302_MW115_210429	✓
ES2116496-002	29-Apr-2021 15:24	1302_MW297_210429	✓
ES2116496-003	29-Apr-2021 12:23	1302_MW241_210429	✓
ES2116496-004	29-Apr-2021 10:26	1302_MW112_210428	✓
ES2116496-005	29-Apr-2021 13:22	1302_MW103_210429	✓
ES2116496-006	29-Apr-2021 14:45	1302_MW303_210429	✓
ES2116496-007	29-Apr-2021 09:55	1302_MW205_210429	✓
ES2116496-008	29-Apr-2021 11:55	1302_MW197_210429	✓
ES2116496-009	29-Apr-2021 14:50	1302_MW144_210429	✓
ES2116496-010	29-Apr-2021 13:10	1302_MW107_210429	✓
ES2116496-011	29-Apr-2021 11:29	1302_MW156_210429 1...	✓
ES2116496-012	29-Apr-2021 12:05	1302_MW240_210429	✓
ES2116496-013	29-Apr-2021 13:22	1302_QC102_210429	✓
ES2116496-014	29-Apr-2021 14:45	1302_QC103_210429	✓
ES2116496-015	29-Apr-2021 14:45	1302_QC203_210429	✓
ES2116496-016	29-Apr-2021 10:44	1302_SW170_210429	✓
ES2116496-017	29-Apr-2021 13:50	1302_SW162_210429	✓
ES2116496-018	29-Apr-2021 11:00	1302_SW101_210429	✓
ES2116496-019	29-Apr-2021 00:00	1302_QC501_210429	✓
ES2116496-020	28-Apr-2021 09:25	1302_SW112_210428	✓
ES2116496-021	28-Apr-2021 16:30	1302_MW209_210428	✓
ES2116496-022	28-Apr-2021 07:35	1302_SW124_210428	✓
ES2116496-023	28-Apr-2021 00:00	1302_QC400_210428	✓
ES2116496-024	28-Apr-2021 09:15	1302_SW113_210428	✓
ES2116496-025	28-Apr-2021 00:00	1302_QC300_210428	✓
ES2116496-026	28-Apr-2021 00:00	1302_SW114_210428	✓
ES2116496-027	28-Apr-2021 08:00	1302_QC500_210428	✓
ES2116496-028	28-Apr-2021 11:05	1302_MW191_210428	✓
ES2116496-029	28-Apr-2021 00:00	1302_MW210_210428	✓
ES2116496-030	28-Apr-2021 11:30	1302_SW168_210428	✓
ES2116496-031	28-Apr-2021 00:00	1302_QC100_210428	✓
ES2116496-032	28-Apr-2021 13:35	1302_SW106_210428	✓
ES2116496-033	28-Apr-2021 15:53	1302_MW180_210428	✓

			WATER - EP231X PFAS - Full Suite (28 analytes)
ES2116496-034	28-Apr-2021 10:35	1302_QC101_210428	✓
ES2116496-035	28-Apr-2021 16:00	1302_MW200_210428	✓
ES2116496-036	28-Apr-2021 08:10	1302_SW120_210428	✓
ES2116496-037	28-Apr-2021 15:15	1302_SW143_210428	✓
ES2116496-038	28-Apr-2021 14:55	1302_SW132_210428	✓
ES2116496-039	28-Apr-2021 10:35	1302_SW109_210428	✓
ES2116496-040	28-Apr-2021 13:15	1302_SW115_210428	✓
ES2116496-041	28-Apr-2021 10:15	1302_MW185_210428	✓
ES2116496-042	28-Apr-2021 15:45	1302_MW211_210428	✓
ES2116496-043	28-Apr-2021 11:45	1302_SW108_210428	✓
ES2116496-044	28-Apr-2021 14:55	1302_SW133_210428	✓
ES2116496-045	28-Apr-2021 16:10	1302_MW176_210428	✓

Proactive Holding Time Report

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

Requested Deliverables

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

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

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

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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2116496**	Page	: 1 of 21
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: GPO BOX 3175 DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 06-May-2021 16:45
Order number	: 60612561	Date Analysis Commenced	: 14-May-2021
C-O-C number	: ----	Issue Date	: 18-May-2021 12:32
Sampler	: [redacted]		
Site	: ----		
Quote number	: SY/139/19 V3		
No. of samples received	: 45		
No. of samples analysed	: 45		

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*
[redacted]	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 Contact 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.
- EP231X: PFAS results for sample #33 confirmed by re-extraction and re-analysis.
- 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: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW115_210429	1302_MW297_210429	1302_MW241_210429	1302_MW112_210428	1302_MW103_210429
				Sampling date / time	29-Apr-2021 09:42	29-Apr-2021 15:24	29-Apr-2021 12:23	29-Apr-2021 10:26	29-Apr-2021 13:22
					ES2116496-001	ES2116496-002	ES2116496-003	ES2116496-004	ES2116496-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**2.76**	**0.08**	**0.38**	**0.41**	**0.39**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**4.36**	**0.09**	**0.37**	**0.44**	**0.79**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**29.4**	**0.80**	**2.94**	**3.73**	**10.6**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**3.41**	**0.05**	**0.23**	**0.28**	**0.48**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**80.5**	**2.80**	**6.26**	**9.18**	**17.3**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		**0.10**	**0.03**	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.5**	<0.1	**0.7**	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**1.15**	**0.04**	**3.79**	**0.18**	**0.26**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**6.76**	**0.22**	**2.34**	**1.04**	**1.61**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.60**	**0.03**	**2.31**	**0.12**	**0.19**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**1.47**	**0.05**	**1.62**	**0.22**	**0.44**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.02**	<0.02	**0.45**	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	**0.04**	<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		**0.12**	<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: WATER (Matrix: WATER)				Sample ID	1302_MW115_210429	1302_MW297_210429	1302_MW241_210429	1302_MW112_210428	1302_MW103_210429
				Sampling date / time	29-Apr-2021 09:42	29-Apr-2021 15:24	29-Apr-2021 12:23	29-Apr-2021 10:26	29-Apr-2021 13:22
Compound	CAS Number	LOR	Unit		ES2116496-001	ES2116496-002	ES2116496-003	ES2116496-004	ES2116496-005
					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	**0.09**	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	**0.31**	<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		**131**	**4.19**	**21.8**	**15.6**	**32.1**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**110**	**3.60**	**9.20**	**12.9**	**27.9**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**123**	**4.02**	**20.7**	**14.9**	**30.8**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**74.6**	**89.2**	**83.1**	**87.6**	**81.9**
13C8-PFOA	----	0.02	%		**83.4**	**81.1**	**80.9**	**81.0**	**81.2**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW303_210429	1302_MW205_210429	1302_MW197_210429	1302_MW144_210429	1302_MW107_210429
				Sampling date / time	29-Apr-2021 14:45	29-Apr-2021 09:55	29-Apr-2021 11:55	29-Apr-2021 14:50	29-Apr-2021 13:10
					ES2116496-006	ES2116496-007	ES2116496-008	ES2116496-009	ES2116496-010
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**2.95**	**0.03**	**0.23**	**0.14**	**0.26**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**4.54**	**0.04**	**0.30**	**0.15**	**0.36**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**30.0**	**0.40**	**3.18**	**1.30**	**3.35**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**2.13**	**0.02**	**0.20**	**0.08**	**0.22**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**21.8**	**0.51**	**5.66**	**2.39**	**6.23**
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	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**1.24**	<0.02	**0.12**	**0.05**	**0.13**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**8.00**	**0.04**	**0.64**	**0.19**	**0.66**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.78**	<0.02	**0.07**	**0.02**	**0.09**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**1.39**	<0.01	**0.15**	**0.05**	**0.16**
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: WATER (Matrix: WATER)				Sample ID	1302_MW303_210429	1302_MW205_210429	1302_MW197_210429	1302_MW144_210429	1302_MW107_210429
				Sampling date / time	29-Apr-2021 14:45	29-Apr-2021 09:55	29-Apr-2021 11:55	29-Apr-2021 14:50	29-Apr-2021 13:10
Compound	CAS Number	LOR	Unit		ES2116496-006	ES2116496-007	ES2116496-008	ES2116496-009	ES2116496-010
					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		**0.08**	<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		**73.9**	**1.04**	**10.6**	**4.37**	**11.5**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**51.8**	**0.91**	**8.84**	**3.69**	**9.58**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**67.2**	**0.98**	**10.0**	**4.14**	**10.9**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**89.8**	**95.1**	**90.7**	**92.4**	**87.2**
13C8-PFOA	----	0.02	%		**83.0**	**84.0**	**83.5**	**85.4**	**82.9**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW156_210429 1302_MW176_210429	1302_MW240_210429	1302_QC102_210429	1302_QC103_210429	1302_QC203_210429
				Sampling date / time	29-Apr-2021 11:29	29-Apr-2021 12:05	29-Apr-2021 13:22	29-Apr-2021 14:45	29-Apr-2021 14:45
					ES2116496-011	ES2116496-012	ES2116496-013	ES2116496-014	ES2116496-015
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.11**	**1.42**	**0.53**	**2.89**	**2.80**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.13**	**1.14**	**1.12**	**4.57**	**4.44**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**1.32**	**11.6**	**15.0**	**35.2**	**35.5**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.10**	**0.94**	**0.71**	**2.23**	**2.20**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**3.46**	**26.5**	**25.3**	**26.2**	**29.2**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	**0.07**	**0.02**	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**1.8**	**0.1**	**1.0**	**0.9**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.05**	**3.01**	**0.36**	**1.22**	**1.18**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.24**	**8.00**	**2.24**	**9.45**	**9.44**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.02**	**4.06**	**0.26**	**0.76**	**0.74**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.06**	**4.41**	**0.62**	**1.42**	**1.44**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**1.23**	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	**0.23**	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	**0.04**	<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	**0.05**	**0.03**	<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: WATER (Matrix: WATER)				Sample ID	1302_MW156_210429 1302_MW176_210429	1302_MW240_210429	1302_QC102_210429	1302_QC103_210429	1302_QC203_210429
				Sampling date / time	29-Apr-2021 11:29	29-Apr-2021 12:05	29-Apr-2021 13:22	29-Apr-2021 14:45	29-Apr-2021 14:45
Compound	CAS Number	LOR	Unit		ES2116496-011	ES2116496-012	ES2116496-013	ES2116496-014	ES2116496-015
					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	**0.48**	<0.05	**0.08**	**0.07**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	**2.21**	<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		**5.49**	**67.2**	**46.3**	**85.0**	**87.9**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**4.78**	**38.1**	**40.3**	**61.4**	**64.7**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**5.26**	**63.5**	**44.4**	**78.2**	**81.3**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**89.3**	**86.8**	**82.7**	**89.0**	**88.3**
13C8-PFOA	----	0.02	%		**81.1**	**84.0**	**81.7**	**85.8**	**83.7**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW170_210429	1302_SW162_210429	1302_SW101_210429	1302_QC501_210429	1302_SW112_210428
				Sampling date / time	29-Apr-2021 10:44	29-Apr-2021 13:50	29-Apr-2021 11:00	29-Apr-2021 00:00	28-Apr-2021 09:25
					ES2116496-016	ES2116496-017	ES2116496-018	ES2116496-019	ES2116496-020
					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	0.02	µg/L		**0.06**	<0.02	**0.05**	<0.02	**0.05**
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		**0.17**	**0.02**	**0.13**	<0.01	**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		<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		**0.03**	<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: WATER (Matrix: WATER)				Sample ID	1302_SW170_210429	1302_SW162_210429	1302_SW101_210429	1302_QC501_210429	1302_SW112_210428
				Sampling date / time	29-Apr-2021 10:44	29-Apr-2021 13:50	29-Apr-2021 11:00	29-Apr-2021 00:00	28-Apr-2021 09:25
Compound	CAS Number	LOR	Unit		ES2116496-016	ES2116496-017	ES2116496-018	ES2116496-019	ES2116496-020
					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		**0.26**	**0.02**	**0.20**	<0.01	**0.09**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.23**	**0.02**	**0.18**	<0.01	**0.09**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.26**	**0.02**	**0.20**	<0.01	**0.09**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.4**	**94.3**	**89.8**	**94.8**	**89.6**
13C8-PFOA	----	0.02	%		**82.6**	**81.6**	**80.8**	**83.1**	**80.7**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW209_210428	1302_SW124_210428	1302_QC400_210428	1302_SW113_210428	1302_QC300_210428
				Sampling date / time	28-Apr-2021 16:30	28-Apr-2021 07:35	28-Apr-2021 00:00	28-Apr-2021 09:15	28-Apr-2021 00:00
Compound	CAS Number	LOR	Unit		ES2116496-021	ES2116496-022	ES2116496-023	ES2116496-024	ES2116496-025
					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	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
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	<0.01	<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: WATER (Matrix: WATER)				Sample ID	1302_MW209_210428	1302_SW124_210428	1302_QC400_210428	1302_SW113_210428	1302_QC300_210428
				Sampling date / time	28-Apr-2021 16:30	28-Apr-2021 07:35	28-Apr-2021 00:00	28-Apr-2021 09:15	28-Apr-2021 00:00
Compound	CAS Number	LOR	Unit		ES2116496-021	ES2116496-022	ES2116496-023	ES2116496-024	ES2116496-025
					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		**0.03**	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**89.6**	**92.7**	**92.2**	**93.2**	**94.5**
13C8-PFOA	----	0.02	%		**82.4**	**81.9**	**84.5**	**81.7**	**85.7**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW114_210428	1302_QC500_210428	1302_MW191_210428	1302_MW210_210428	1302_SW168_210428
				Sampling date / time	28-Apr-2021 00:00	28-Apr-2021 08:00	28-Apr-2021 11:05	28-Apr-2021 00:00	28-Apr-2021 11:30
					ES2116496-026	ES2116496-027	ES2116496-028	ES2116496-029	ES2116496-030
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.07**	<0.02	**0.05**	**0.21**	**0.07**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.04**	<0.02	**0.07**	**0.12**	**0.08**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**0.45**	<0.02	**0.79**	**1.55**	**0.61**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.04**	<0.02	**0.03**	**0.11**	**0.03**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.26**	<0.01	**1.13**	**2.73**	**0.72**
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		**0.03**	<0.02	**0.02**	**0.04**	**0.05**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.20**	<0.02	**0.13**	**0.16**	**0.23**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	**0.03**	**0.03**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.03**	<0.01	**0.03**	**0.06**	**0.05**
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: WATER (Matrix: WATER)				Sample ID	1302_SW114_210428	1302_QC500_210428	1302_MW191_210428	1302_MW210_210428	1302_SW168_210428
				Sampling date / time	28-Apr-2021 00:00	28-Apr-2021 08:00	28-Apr-2021 11:05	28-Apr-2021 00:00	28-Apr-2021 11:30
Compound	CAS Number	LOR	Unit		ES2116496-026	ES2116496-027	ES2116496-028	ES2116496-029	ES2116496-030
					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		**2.12**	<0.01	**2.25**	**5.01**	**1.87**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.71**	<0.01	**1.92**	**4.28**	**1.33**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**2.04**	<0.01	**2.15**	**4.78**	**1.76**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**90.2**	**92.4**	**93.6**	**92.0**	**99.1**
13C8-PFOA	----	0.02	%		**82.6**	**82.2**	**83.4**	**83.8**	**83.7**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC100_210428	1302_SW106_210428	1302_MW180_210428	1302_QC101_210428	1302_MW200_210428
				Sampling date / time	28-Apr-2021 00:00	28-Apr-2021 13:35	28-Apr-2021 15:53	28-Apr-2021 10:35	28-Apr-2021 16:00
Compound	CAS Number	LOR	Unit		ES2116496-031	ES2116496-032	ES2116496-033	ES2116496-034	ES2116496-035
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.03**	<0.02	**0.03**	**0.05**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.03**	<0.02	**0.04**	**0.06**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		<0.02	**0.30**	**0.07**	**0.33**	**0.57**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.03**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.41**	<0.01	**0.44**	**0.89**
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	**0.07**	<0.02	**0.08**	**0.07**
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	**0.02**	<0.01	**0.02**	**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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC100_210428	1302_SW106_210428	1302_MW180_210428	1302_QC101_210428	1302_MW200_210428
				Sampling date / time	28-Apr-2021 00:00	28-Apr-2021 13:35	28-Apr-2021 15:53	28-Apr-2021 10:35	28-Apr-2021 16:00
Compound	CAS Number	LOR	Unit		ES2116496-031	ES2116496-032	ES2116496-033	ES2116496-034	ES2116496-035
					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	**0.88**	**0.07**	**0.94**	**1.69**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.71**	**0.07**	**0.77**	**1.46**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.85**	**0.07**	**0.90**	**1.60**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**89.6**	**93.7**	**90.0**	**95.3**	**93.7**
13C8-PFOA	----	0.02	%		**84.5**	**82.3**	**82.4**	**83.0**	**83.4**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW120_210428	1302_SW143_210428	1302_SW132_210428	1302_SW109_210428	1302_SW115_210428
				Sampling date / time	28-Apr-2021 08:10	28-Apr-2021 15:15	28-Apr-2021 14:55	28-Apr-2021 10:35	28-Apr-2021 13:15
					ES2116496-036	ES2116496-037	ES2116496-038	ES2116496-039	ES2116496-040
					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	**0.04**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	**0.04**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**0.02**	<0.02	**0.07**	**0.32**	<0.02
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	**0.09**	**0.43**	**0.02**
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	**0.08**	<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	**0.02**	<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: WATER (Matrix: WATER)				Sample ID	1302_SW120_210428	1302_SW143_210428	1302_SW132_210428	1302_SW109_210428	1302_SW115_210428
				Sampling date / time	28-Apr-2021 08:10	28-Apr-2021 15:15	28-Apr-2021 14:55	28-Apr-2021 10:35	28-Apr-2021 13:15
Compound	CAS Number	LOR	Unit		ES2116496-036	ES2116496-037	ES2116496-038	ES2116496-039	ES2116496-040
					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		**0.04**	<0.01	**0.16**	**0.93**	**0.02**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.04**	<0.01	**0.16**	**0.75**	**0.02**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.04**	<0.01	**0.16**	**0.89**	**0.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**91.0**	**94.6**	**92.4**	**87.9**	**91.6**
13C8-PFOA	----	0.02	%		**84.6**	**83.6**	**81.6**	**90.3**	**88.0**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW185_210428	1302_MW211_210428	1302_SW108_210428	1302_SW133_210428	1302_MW176_210428
				Sampling date / time	28-Apr-2021 10:15	28-Apr-2021 15:45	28-Apr-2021 11:45	28-Apr-2021 14:55	28-Apr-2021 16:10
					ES2116496-041	ES2116496-042	ES2116496-043	ES2116496-044	ES2116496-045
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	**0.03**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	**0.03**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**0.09**	**0.03**	**0.27**	<0.02	**0.03**
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		**0.06**	**0.04**	**0.40**	<0.01	**0.05**
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	**0.06**	<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: WATER (Matrix: WATER)				Sample ID	1302_MW185_210428	1302_MW211_210428	1302_SW108_210428	1302_SW133_210428	1302_MW176_210428
				Sampling date / time	28-Apr-2021 10:15	28-Apr-2021 15:45	28-Apr-2021 11:45	28-Apr-2021 14:55	28-Apr-2021 16:10
Compound	CAS Number	LOR	Unit		ES2116496-041	ES2116496-042	ES2116496-043	ES2116496-044	ES2116496-045
					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		**0.15**	**0.07**	**0.80**	<0.01	**0.08**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.15**	**0.07**	**0.67**	<0.01	**0.08**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.15**	**0.07**	**0.77**	<0.01	**0.08**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.4**	**94.8**	**96.1**	**90.2**	**88.0**
13C8-PFOA	----	0.02	%		**89.4**	**91.3**	**80.4**	**90.2**	**87.3**

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2116496**	Page	: 1 of 12
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: GPO BOX 3175 DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 06-May-2021
Order number	: 60612561	Date Analysis Commenced	: 14-May-2021
C-O-C number	: ----	Issue Date	: 18-May-2021
Sampler	: [redacted]		
Site	: ----		
Quote number	: SY/139/19 V3		
No. of samples received	: 45		
No. of samples analysed	: 45		

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*
[redacted]	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

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 (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 3674964)									
ES2116496-017	1302_SW162_210429	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: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	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
ES2116496-018	1302_SW101_210429	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.13	0.15	15.8	0% - 50%
		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: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.05	0.06	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: 3674968)									
ES2116496-022	1302_SW124_210428	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: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	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
ES2116496-032	1302_SW106_210428	EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.41	0.34	16.7	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	0.30	0.26	13.0	0% - 50%
		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

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: 3674973)									
ES2116789-022	Anonymous	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: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	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: 3674964)									
ES2116496-017	1302_SW162_210429	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
ES2116496-018	1302_SW101_210429	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	0.03	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: 3674968)									
ES2116496-022	1302_SW124_210428	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

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: 3674968) - continued									
ES2116496-022	1302_SW124_210428	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
ES2116496-032	1302_SW106_210428	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	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	0.07	0.06	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: 3674973)									
ES2116789-022	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: 3674964)									
ES2116496-017	1302_SW162_210429	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
ES2116496-018	1302_SW101_210429	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: 3674964) - continued									
ES2116496-018	1302_SW101_210429	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: 3674968)									
ES2116496-022	1302_SW124_210428	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
ES2116496-032	1302_SW106_210428	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: 3674973)									
ES2116789-022	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	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: 3674973) - continued									
ES2116789-022	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 3674964)									
ES2116496-017	1302_SW162_210429	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
ES2116496-018	1302_SW101_210429	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: 3674968)									
ES2116496-022	1302_SW124_210428	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
ES2116496-032	1302_SW106_210428	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	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: 3674968) - continued									
ES2116496-032	1302_SW106_210428	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: 3674973)									
ES2116789-022	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: 3674964)									
ES2116496-017	1302_SW162_210429	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.02	0.0	No Limit
ES2116496-018	1302_SW101_210429	EP231X: Sum of PFAS	----	0.01	µg/L	0.20	0.24	18.2	0% - 20%
EP231P: PFAS Sums (QC Lot: 3674968)									
ES2116496-022	1302_SW124_210428	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
ES2116496-032	1302_SW106_210428	EP231X: Sum of PFAS	----	0.01	µg/L	0.88	0.72	20.0	0% - 20%
EP231P: PFAS Sums (QC Lot: 3674973)									
ES2116789-022	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3674964)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	111	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	111	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	114	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	98.8	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: 3674968)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	97.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	110	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	110	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	91.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	100	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3674973)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	112	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	100	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	95.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	108	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3674964)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	97.8	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	117	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	118	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	115	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	120	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	114	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	111	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	111	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	118	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3674968)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	94.5	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: 3674968) - continued								
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	123	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	123	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	114	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	119	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	117	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	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	107	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: 3674973)								
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	109	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	113	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	120	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	118	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.2	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	0.625 µg/L	110	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3674964)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	109	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	92.7	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	95.3	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	105	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	115	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3674968)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	109	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	98.1	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	87.0	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: 3674968) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	95.2	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.6	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	112	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	112	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3674973)								
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	76.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	75.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	102	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	87.0	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	114	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	113	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3674964)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	105	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	121	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	116	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	106	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3674968)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	100	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	110	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	113	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	91.8	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3674973)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	105	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	113	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	87.4	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3674964)							
ES2116496-017	1302_SW162_210429	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	96.5	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	110	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	112	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	100	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	99.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3674968)							
ES2116496-022	1302_SW124_210428	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	90.4	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	102	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	103	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	83.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	100	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3674964)							
ES2116496-017	1302_SW162_210429	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	98.9	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	116	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	126	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	111	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	113	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	109	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	113	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	113	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	110	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	100	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	111	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3674968)							
ES2116496-022	1302_SW124_210428	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	87.5	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	111	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	113	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	105	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	105	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	108	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	104	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	101	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	96.2	65.0	144

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: 3674968) - continued							
ES2116496-022	1302_SW124_210428	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3674964)							
ES2116496-017	1302_SW162_210429	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	108	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	100	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	94.9	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	88.1	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	102	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	111	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: 3674968)							
ES2116496-022	1302_SW124_210428	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	101	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	93.5	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	85.9	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	90.8	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	92.0	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	105	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	104	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3674964)							
ES2116496-017	1302_SW162_210429	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	86.8	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	115	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	118	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	81.8	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3674968)							
ES2116496-022	1302_SW124_210428	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	86.8	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	104	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	108	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	89.2	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2116496**	Page	: 1 of 8
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 06-May-2021
Site	: ----	Issue Date	: 18-May-2021
Sampler	: [redacted]	No. of samples received	: 45
Order number	: 60612561	No. of samples analysed	: 45

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

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

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	5	55	9.09	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	55	3.64	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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW112_210428, 1302_MW209_210428, 1302_SW124_210428, 1302_QC400_210428, 1302_SW113_210428, 1302_QC300_210428, 1302_SW114_210428, 1302_QC500_210428, 1302_MW191_210428, 1302_MW210_210428, 1302_SW168_210428, 1302_QC100_210428, 1302_SW106_210428, 1302_MW180_210428, 1302_QC101_210428, 1302_MW200_210428, 1302_SW120_210428, 1302_SW143_210428, 1302_SW132_210428, 1302_SW109_210428, 1302_SW115_210428, 1302_MW185_210428, 1302_MW211_210428, 1302_SW108_210428, 1302_SW133_210428, 1302_MW176_210428	**28-Apr-2021**	**14-May-2021**	25-Oct-2021	✓	**14-May-2021**	25-Oct-2021	✓
HDPE (no PTFE) (EP231X)							

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 - Continued							
1302_MW115_210429, 1302_MW297_210429, 1302_MW241_210429, 1302_MW112_210428, 1302_MW103_210429, 1302_MW303_210429, 1302_MW205_210429, 1302_MW197_210429, 1302_MW144_210429, 1302_MW107_210429, 1302_MW156_210429 - 1302_MW176_210429, 1302_MW240_210429, 1302_QC102_210429, 1302_QC103_210429, 1302_QC203_210429, 1302_SW170_210429, 1302_SW162_210429, 1302_SW101_210429, 1302_QC501_210429	**29-Apr-2021**	**14-May-2021**	26-Oct-2021	✓	**14-May-2021**	26-Oct-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW112_210428, 1302_MW209_210428, 1302_SW124_210428, 1302_QC400_210428, 1302_SW113_210428, 1302_QC300_210428, 1302_SW114_210428, 1302_QC500_210428, 1302_MW191_210428, 1302_MW210_210428, 1302_SW168_210428, 1302_QC100_210428, 1302_SW106_210428, 1302_MW180_210428, 1302_QC101_210428, 1302_MW200_210428, 1302_SW120_210428, 1302_SW143_210428, 1302_SW132_210428, 1302_SW109_210428, 1302_SW115_210428, 1302_MW185_210428, 1302_MW211_210428, 1302_SW108_210428, 1302_SW133_210428, 1302_MW176_210428	**28-Apr-2021**	**14-May-2021**	25-Oct-2021	✓	**14-May-2021**	25-Oct-2021	✓
HDPE (no PTFE) (EP231X)							
1302_MW115_210429, 1302_MW297_210429, 1302_MW241_210429, 1302_MW112_210428, 1302_MW103_210429, 1302_MW303_210429, 1302_MW205_210429, 1302_MW197_210429, 1302_MW144_210429, 1302_MW107_210429, 1302_MW156_210429 - 1302_MW176_210429, 1302_MW240_210429, 1302_QC102_210429, 1302_QC103_210429, 1302_QC203_210429, 1302_SW170_210429, 1302_SW162_210429, 1302_SW101_210429, 1302_QC501_210429	**29-Apr-2021**	**14-May-2021**	26-Oct-2021	✓	**14-May-2021**	26-Oct-2021	✓

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)							
1302_SW112_210428, 1302_MW209_210428, 1302_SW124_210428, 1302_QC400_210428, 1302_SW113_210428, 1302_QC300_210428, 1302_SW114_210428, 1302_QC500_210428, 1302_MW191_210428, 1302_MW210_210428, 1302_SW168_210428, 1302_QC100_210428, 1302_SW106_210428, 1302_MW180_210428, 1302_QC101_210428, 1302_MW200_210428, 1302_SW120_210428, 1302_SW143_210428, 1302_SW132_210428, 1302_SW109_210428, 1302_SW115_210428, 1302_MW185_210428, 1302_MW211_210428, 1302_SW108_210428, 1302_SW133_210428, 1302_MW176_210428	**28-Apr-2021**	**14-May-2021**	25-Oct-2021	✓	**14-May-2021**	25-Oct-2021	✓
HDPE (no PTFE) (EP231X)							
1302_MW115_210429, 1302_MW297_210429, 1302_MW241_210429, 1302_MW112_210428, 1302_MW103_210429, 1302_MW303_210429, 1302_MW205_210429, 1302_MW197_210429, 1302_MW144_210429, 1302_MW107_210429, 1302_MW156_210429 - 1302_MW176_210429, 1302_MW240_210429, 1302_QC102_210429, 1302_QC103_210429, 1302_QC203_210429, 1302_SW170_210429, 1302_SW162_210429, 1302_SW101_210429, 1302_QC501_210429	**29-Apr-2021**	**14-May-2021**	26-Oct-2021	✓	**14-May-2021**	26-Oct-2021	✓

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)							
1302_SW112_210428, 1302_MW209_210428, 1302_SW124_210428, 1302_QC400_210428, 1302_SW113_210428, 1302_QC300_210428, 1302_SW114_210428, 1302_QC500_210428, 1302_MW191_210428, 1302_MW210_210428, 1302_SW168_210428, 1302_QC100_210428, 1302_SW106_210428, 1302_MW180_210428, 1302_QC101_210428, 1302_MW200_210428, 1302_SW120_210428, 1302_SW143_210428, 1302_SW132_210428, 1302_SW109_210428, 1302_SW115_210428, 1302_MW185_210428, 1302_MW211_210428, 1302_SW108_210428, 1302_SW133_210428, 1302_MW176_210428	**28-Apr-2021**	**14-May-2021**	25-Oct-2021	✓	**14-May-2021**	25-Oct-2021	✓
HDPE (no PTFE) (EP231X)							
1302_MW115_210429, 1302_MW297_210429, 1302_MW241_210429, 1302_MW112_210428, 1302_MW103_210429, 1302_MW303_210429, 1302_MW205_210429, 1302_MW197_210429, 1302_MW144_210429, 1302_MW107_210429, 1302_MW156_210429 - 1302_MW176_210429, 1302_MW240_210429, 1302_QC102_210429, 1302_QC103_210429, 1302_QC203_210429, 1302_SW170_210429, 1302_SW162_210429, 1302_SW101_210429, 1302_QC501_210429	**29-Apr-2021**	**14-May-2021**	26-Oct-2021	✓	**14-May-2021**	26-Oct-2021	✓

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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_SW112_210428, 1302_MW209_210428, 1302_SW124_210428, 1302_QC400_210428, 1302_SW113_210428, 1302_QC300_210428, 1302_SW114_210428, 1302_QC500_210428, 1302_MW191_210428, 1302_MW210_210428, 1302_SW168_210428, 1302_QC100_210428, 1302_SW106_210428, 1302_MW180_210428, 1302_QC101_210428, 1302_MW200_210428, 1302_SW120_210428, 1302_SW143_210428, 1302_SW132_210428, 1302_SW109_210428, 1302_SW115_210428, 1302_MW185_210428, 1302_MW211_210428, 1302_SW108_210428, 1302_SW133_210428, 1302_MW176_210428	**28-Apr-2021**	**14-May-2021**	25-Oct-2021	✓	**14-May-2021**	25-Oct-2021	✓
HDPE (no PTFE) (EP231X)							
1302_MW115_210429, 1302_MW297_210429, 1302_MW241_210429, 1302_MW112_210428, 1302_MW103_210429, 1302_MW303_210429, 1302_MW205_210429, 1302_MW197_210429, 1302_MW144_210429, 1302_MW107_210429, 1302_MW156_210429 - 1302_MW176_210429, 1302_MW240_210429, 1302_QC102_210429, 1302_QC103_210429, 1302_QC203_210429, 1302_SW170_210429, 1302_SW162_210429, 1302_SW101_210429, 1302_QC501_210429	**29-Apr-2021**	**14-May-2021**	26-Oct-2021	✓	**14-May-2021**	26-Oct-2021	✓

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	5	55	**9.09**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	55	**5.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	55	**5.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	55	**3.64**	**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
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	: **ES2117036**		
Amendment	: **2**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: GPO BOX 3175 DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: NT_1302_PFASOMP	Page	: 1 of 2
Order number	: 60612561	Quote number	: ES2020AECOMAU0033 (EN/004/20)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: AP		

Dates

Date Samples Received	: 07-May-2021 12:30	Issue Date	: 31-May-2021
Client Requested Due Date	: 17-May-2021	Scheduled Reporting Date	: **17-May-2021**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 6.4 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 12 / 12

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
- **QC204 has been forwarded to NMI**
- **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 absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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)
ES2117036-001	06-May-2021 14:20	1302_MW215_210506	✓
ES2117036-002	06-May-2021 10:24	1302_MW422_210506	✓
ES2117036-003	06-May-2021 10:35	1302_MW139_210506	✓
ES2117036-004	06-May-2021 08:56	1302_MW195_210506	✓
ES2117036-005	06-May-2021 08:30	1302_MW194_210506	✓
ES2117036-006	06-May-2021 00:36	1302_MW148_210506	✓
ES2117036-007	06-May-2021 10:57	1302_MW141_210506	✓
ES2117036-008	06-May-2021 12:07	1302_MW128_210506	✓
ES2117036-009	06-May-2021 12:07	1302_QC104_210506	✓
ES2117036-010	06-May-2021 09:50	1302_MW193_210506	✓
ES2117036-011	06-May-2021 11:16	1302_MW133_210506	✓
ES2117036-012	06-May-2021 09:17	1302_SW104_210506	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV) Email [redacted]
- Chain of Custody (CoC) (COC) Email [redacted]

[redacted]

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

[redacted]

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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2117036**	Page	: 1 of 9
Amendment	: **2**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: GPO BOX 3175 DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 07-May-2021 12:30
Order number	: 60612561	Date Analysis Commenced	: 15-May-2021
C-O-C number	: ----	Issue Date	: 31-May-2021 15:57
Sampler	: AP		
Site	: ----		
Quote number	: EN/004/20		
No. of samples received	: 12		
No. of samples analysed	: 12		

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*
[redacted]	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 Contact 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.
- Amendment (31/05/2021): This report has been amended as a result of a request to change sample identification numbers (IDs) received from AECOM on 31/05/2021, for samples ES2117036-012. All analysis results are as per the previous report.
- 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: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW215_210506	1302_MW422_210506	1302_MW139_210506	1302_MW195_210506	1302_MW194_210506
				Sampling date / time	06-May-2021 14:20	06-May-2021 10:24	06-May-2021 10:35	06-May-2021 08:56	06-May-2021 08:30
					ES2117036-001	ES2117036-002	ES2117036-003	ES2117036-004	ES2117036-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.20**	**3.48**	<0.02	<0.02	**0.06**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.27**	**3.71**	<0.02	<0.02	**0.08**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**2.26**	**26.5**	**0.22**	**0.03**	**0.77**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.22**	**1.99**	<0.02	<0.02	**0.06**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**5.52**	**47.3**	**0.44**	**0.06**	**1.83**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	**0.07**	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**0.9**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.12**	**1.92**	<0.02	<0.02	**0.03**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.34**	**8.01**	**0.05**	<0.02	**0.18**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.08**	**1.00**	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.12**	**2.01**	**0.01**	<0.01	**0.04**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.04**	<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	**0.05**	<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: WATER (Matrix: WATER)				Sample ID	1302_MW215_210506	1302_MW422_210506	1302_MW139_210506	1302_MW195_210506	1302_MW194_210506
				Sampling date / time	06-May-2021 14:20	06-May-2021 10:24	06-May-2021 10:35	06-May-2021 08:56	06-May-2021 08:30
Compound	CAS Number	LOR	Unit		ES2117036-001	ES2117036-002	ES2117036-003	ES2117036-004	ES2117036-005
					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		**9.13**	**97.0**	**0.72**	**0.09**	**3.05**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**7.78**	**73.8**	**0.66**	**0.09**	**2.60**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**8.64**	**91.1**	**0.72**	**0.09**	**2.91**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**96.0**	**106**	**115**	**103**
13C8-PFOA	----	0.02	%		**89.6**	**89.0**	**70.2**	**69.6**	**72.1**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW148_210506	1302_MW141_210506	1302_MW128_210506	1302_QC104_210506	1302_MW193_210506
				Sampling date / time	06-May-2021 00:36	06-May-2021 10:57	06-May-2021 12:07	06-May-2021 12:07	06-May-2021 09:50
					ES2117036-006	ES2117036-007	ES2117036-008	ES2117036-009	ES2117036-010
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.16**	<0.02	**0.16**	**0.16**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.32**	<0.02	**0.22**	**0.22**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**2.88**	**0.19**	**2.11**	**2.10**	**0.03**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.22**	<0.02	**0.14**	**0.14**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**3.57**	**0.11**	**3.56**	**4.64**	**0.10**
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		**0.07**	<0.02	**0.12**	**0.12**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.42**	<0.02	**0.47**	**0.46**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.06**	<0.02	**0.06**	**0.06**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.12**	<0.01	**0.13**	**0.12**	<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: WATER (Matrix: WATER)				Sample ID	1302_MW148_210506	1302_MW141_210506	1302_MW128_210506	1302_QC104_210506	1302_MW193_210506
				Sampling date / time	06-May-2021 00:36	06-May-2021 10:57	06-May-2021 12:07	06-May-2021 12:07	06-May-2021 09:50
Compound	CAS Number	LOR	Unit		ES2117036-006	ES2117036-007	ES2117036-008	ES2117036-009	ES2117036-010
					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		**7.82**	**0.30**	**6.97**	**8.02**	**0.13**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**6.45**	**0.30**	**5.67**	**6.74**	**0.13**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**7.28**	**0.30**	**6.61**	**7.66**	**0.13**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**99.5**	**96.3**	**98.7**	**89.6**
13C8-PFOA	----	0.02	%		**72.6**	**72.9**	**78.3**	**82.0**	**93.5**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW133_210506	1302_SW104_210506	----	----	----
				Sampling date / time	06-May-2021 11:16	06-May-2021 09:17	----	----	----
Compound	CAS Number	LOR	Unit		ES2117036-011	ES2117036-012	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.31**	**0.05**	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.39**	**0.05**	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L		**3.33**	**0.47**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.35**	**0.04**	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**11.5**	**1.20**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		**0.04**	<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		**0.19**	**0.02**	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**1.09**	**0.12**	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.11**	<0.02	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.27**	**0.03**	----	----	----
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		**0.03**	<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	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW133_210506	1302_SW104_210506	----	----	----
				Sampling date / time	06-May-2021 11:16	06-May-2021 09:17	----	----	----
Compound	CAS Number	LOR	Unit		ES2117036-011	ES2117036-012	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	----	----	----
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		**17.6**	**1.98**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**14.8**	**1.67**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**16.8**	**1.89**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.0**	**98.8**	----	----	----
13C8-PFOA	----	0.02	%		**95.0**	**96.5**	----	----	----

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2117036**	Page	: 1 of 5
Amendment	: **2**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: GPO BOX 3175 DARWIN NT, AUSTRALIA 0801	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 07-May-2021
Order number	: 60612561	Date Analysis Commenced	: 15-May-2021
C-O-C number	: ----	Issue Date	: 31-May-2021
Sampler	: AP		
Site	: ----		
Quote number	: EN/004/20		
No. of samples received	: 12		
No. of samples analysed	: 12		

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*
[redacted]i	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

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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3679202)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	126	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	93.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	129	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	98.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	118	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 3679823)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	77.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	121	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.02	µg/L	<0.02	0.25 µg/L	114	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	115	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	87.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	106	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3679202)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	99.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	127	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	122	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	120	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	126	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	127	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	116	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	123	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	123	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 3679823)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	88.3	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	110	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	108	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	120	69.0	133

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: 3679823) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	78.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	133	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	118	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3679202)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	130	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	128	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	131	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	106	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	98.7	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	111	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 3679823)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	90.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	90.6	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	91.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	67.5	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	120	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	91.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	120	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3679202)								
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	124	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	116	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	85.0	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 3679823)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	96.4	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	95.8	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	136	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	99.8	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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2117036**	Page	: 1 of 5
Amendment	: **2**		
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 07-May-2021
Site	: ----	Issue Date	: 31-May-2021
Sampler	: AP	No. of samples received	: 12
Order number	: 60612561	No. of samples analysed	: 12

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

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

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	0	38	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	38	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: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_MW215_210506, 1302_MW422_210506	**06-May-2021**	**15-May-2021**	02-Nov-2021	✓	**15-May-2021**	02-Nov-2021	✓
HDPE (no PTFE) (EP231X)							
1302_MW139_210506, 1302_MW195_210506, 1302_MW194_210506, 1302_MW148_210506, 1302_MW141_210506, 1302_MW128_210506, 1302_QC104_210506, 1302_MW193_210506, 1302_MW133_210506, 1302_SW104_210506	**06-May-2021**	**17-May-2021**	02-Nov-2021	✓	**17-May-2021**	02-Nov-2021	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_MW215_210506, 1302_MW422_210506	**06-May-2021**	**15-May-2021**	02-Nov-2021	✓	**15-May-2021**	02-Nov-2021	✓
HDPE (no PTFE) (EP231X)							
1302_MW139_210506, 1302_MW195_210506, 1302_MW194_210506, 1302_MW148_210506, 1302_MW141_210506, 1302_MW128_210506, 1302_QC104_210506, 1302_MW193_210506, 1302_MW133_210506, 1302_SW104_210506	**06-May-2021**	**17-May-2021**	02-Nov-2021	✓	**17-May-2021**	02-Nov-2021	✓

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)								
1302_MW215_210506,	1302_MW422_210506	**06-May-2021**	**15-May-2021**	02-Nov-2021	✓	**15-May-2021**	02-Nov-2021	✓
HDPE (no PTFE) (EP231X)								
1302_MW139_210506,	1302_MW195_210506,	**06-May-2021**	**17-May-2021**	02-Nov-2021	✓	**17-May-2021**	02-Nov-2021	✓
1302_MW194_210506,	1302_MW148_210506,							
1302_MW141_210506,	1302_MW128_210506,							
1302_QC104_210506,	1302_MW193_210506,							
1302_MW133_210506,	1302_SW104_210506							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
1302_MW215_210506,	1302_MW422_210506	**06-May-2021**	**15-May-2021**	02-Nov-2021	✓	**15-May-2021**	02-Nov-2021	✓
HDPE (no PTFE) (EP231X)								
1302_MW139_210506,	1302_MW195_210506,	**06-May-2021**	**17-May-2021**	02-Nov-2021	✓	**17-May-2021**	02-Nov-2021	✓
1302_MW194_210506,	1302_MW148_210506,							
1302_MW141_210506,	1302_MW128_210506,							
1302_QC104_210506,	1302_MW193_210506,							
1302_MW133_210506,	1302_SW104_210506							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
1302_MW215_210506,	1302_MW422_210506	**06-May-2021**	**15-May-2021**	02-Nov-2021	✓	**15-May-2021**	02-Nov-2021	✓
HDPE (no PTFE) (EP231X)								
1302_MW139_210506,	1302_MW195_210506,	**06-May-2021**	**17-May-2021**	02-Nov-2021	✓	**17-May-2021**	02-Nov-2021	✓
1302_MW194_210506,	1302_MW148_210506,							
1302_MW141_210506,	1302_MW128_210506,							
1302_QC104_210506,	1302_MW193_210506,							
1302_MW133_210506,	1302_SW104_210506							

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	38	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	38	**0.00**	**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
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.

Australian Government
Department of Industry, Science, Energy and Resources

National Measurement Institute

SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [redacted]

Customer: AECOM SERVICES PTY LTD

Address: 34 MCLACHLAN STREET
DARWIN NT 900

Email: [redacted]

Telephone:

Fax:

LABORATORY DETAILS

Lab: National Measurement Institute

Contact: [redacted]

Address: 105 Delhi Road, North Ryde, NSW
NSW 2113

Email: [redacted]

Telephone: [redacted]

Fax:

SAMPLE DETAILS

NMI Job Name: **AECO09/210507**

Total No. of Samples: **3**

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N21/011711	14-MAY-2021	1302_QC202_210429	WATER 29/04/2021 13:22
N21/011712	14-MAY-2021	1302_QC200_210428	WATER 28/04/2021 7:35
N21/011713	14-MAY-2021	1302_QC201_210428	WATER 28/04/2021 16:05

SAMPLE RECEIVED CONDITION

Date samples received:	7-MAY-2021
Sample received in good order:	Yes
NMI Quotation no. provided:	
Client purchase order number:	60612561
Temperature of samples:	Chilled
Comments:	
Mode of Delivery:	Courier

Additional Terms and Conditions

Incomplete / unclear information about samples or required testing will delay the start of the analysis work

If you require your Purchase Order (PO) number to be included on our invoice, please provide the number during sample submission and before the completion of work to avoid unnecessary delays and/or additional processing/handling fees.

The lodgement of an order or receipt of samples for NMI services referenced in this Sample Receipt Notification constitutes an acceptence of the current version of NMI Terms and Conditions or other applicable Terms referenced in the NMI Quotation. NMI Terms and Conditions are available on the web at https://www.industry.gov.au/client-services/testing-and-analysis-services/chemical-and-biological-analysis-services-terms-and-conditions

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO09/210507 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	112	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	109	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	104	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	104	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	102	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	119	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	105	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	114	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	118	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	105	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	114	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	116	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	114	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	114	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	105	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	110	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	106	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	104	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	105	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	124	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	102	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	100	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	96	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	132	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	104	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	113	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	106	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	112	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	109	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference.

Signed: [redacted]

[redacted]

Organics Manager, NMI-North Ryde

Date: **14/05/2021**

REPORT OF ANALYSIS

Report No. RN1314232

Client	: AECOM SERVICES PTY LTD	**Job No.**	: AECO09/210507
	34 MCLACHLAN STREET	**Quote No.**	: QT-02018
	DARWIN NT 900	**Order No.**	: 60612561
		Date Received	: 07-MAY-2021
Attention	: [redacted]	**Sampled By**	: CLIENT
Project Name	:		
Your Client Services Manager	: [redacted]	**Phone**	: [redacted]

Lab Reg No.	Sample Ref	Sample Description
N21/011711	1302_QC202_210429	WATER 29/04/2021 13:22
N21/011712	1302_QC200_210428	WATER 28/04/2021 7:35
N21/011713	1302_QC201_210428	WATER 28/04/2021 16:05

Lab Reg No.		N21/011711	N21/011712	N21/011713		
Date Sampled		29-APR-2021	28-APR-2021	29-APR-2021		
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	0.11	<0.05	<0.05		NR70
PFPeA (2706-90-3)	ug/L	0.24	<0.02	<0.02		NR70
PFHxA (307-24-4)	ug/L	1.2	<0.01	0.060		NR70
PFHpA (375-85-9)	ug/L	0.16	<0.01	<0.01		NR70
PFOA (335-67-1)	ug/L	0.40	<0.01	0.017		NR70
PFNA (375-95-1)	ug/L	0.012	<0.01	0.013		NR70
PFDA (335-76-2)	ug/L	<0.01	<0.01	<0.01		NR70
PFUdA (2058-94-8)	ug/L	<0.01	<0.01	<0.01		NR70
PFDoA (307-55-1)	ug/L	<0.01	<0.01	<0.01		NR70
PFTrDA (72629-94-8)	ug/L	<0.02	<0.02	<0.02		NR70
PFTeDA (376-06-7)	ug/L	<0.02	<0.02	<0.02		NR70
PFHxDA (67905-19-5)	ug/L	<0.02	<0.02	<0.02		NR70
PFODA (16517-11-6)	ug/L	<0.05	<0.05	<0.05		NR70
FOUEA (70887-84-2)	ug/L	<0.01	<0.01	<0.01		NR70
PFDS (335-77-3)	ug/L	<0.01	<0.01	<0.01		NR70
PFPeS (2706-91-4)	ug/L	0.60	<0.01	0.031		NR70
PFHxS (355-46-4)	ug/L	7.0	<0.01	0.27		NR70
PFHpS (375-92-8)	ug/L	0.30	<0.01	0.011		NR70
PFOS (1763-23-1)	ug/L	15	<0.02	0.43		NR70
PFNS (68259-12-1)	ug/L	<0.01	<0.01	<0.01		NR70
PFBS (375-73-5)	ug/L	0.43	<0.01	0.032		NR70
PFOSA (754-91-6)	ug/L	<0.01	<0.01	<0.01		NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02	<0.02	<0.02		NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02	<0.02	<0.02		NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01	<0.01	<0.01		NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01	<0.01	<0.01		NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05	<0.05	<0.05		NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05	<0.05		NR70

REPORT OF ANALYSIS

Report No. RN1314232

Lab Reg No.		N21/011711	N21/011712	N21/011713		
Date Sampled		29-APR-2021	28-APR-2021	29-APR-2021		
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01	<0.01		NR70
6:2 FTS (27619-97-2)	ug/L	<0.01	<0.01	<0.01		NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01	<0.01		NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01	<0.01		NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02	<0.02		NR70
PFBA (Surrogate Recovery)	%	121	106	100		NR70
PFPeA (Surrogate Recovery)	%	122	105	99		NR70
PFHxA (Surrogate Recovery)	%	123	109	104		NR70
PFHpA (Surrogate Recovery)	%	132	116	103		NR70
PFOA (Surrogate Recovery)	%	118	116	101		NR70
PFNA (Surrogate Recovery)	%	101	95	97		NR70
PFDA (Surrogate Recovery)	%	111	102	86		NR70
PFUdA (Surrogate Recovery)	%	113	93	91		NR70
PFDoA (Surrogate Recovery)	%	107	88	81		NR70
PFTeDA (Surrogate Recovery)	%	118	89	88		NR70
PFHxDA (Surrogate Recovery)	%	117	104	89		NR70
FOUEA (Surrogate Recovery)	%	99	86	73		NR70
PFBS (Surrogate Recovery)	%	115	101	92		NR70
PFHxS (Surrogate Recovery)	%	104	111	95		NR70
PFOS (Surrogate Recovery)	%	107	107	106		NR70
PFOSA (Surrogate Recovery)	%	96	84	76		NR70
N-MeFOSA (Surrogate Recovery)	%	63	86	68		NR70
N-EtFOSA (Surrogate Recovery)	%	101	97	69		NR70
N-MeFOSAA (Surrogate Recovery)	%	102	75	71		NR70
N-EtFOSAA (Surrogate Recovery)	%	134	95	79		NR70
N-MeFOSE (Surrogate Recovery)	%	98	91	90		NR70
N-EtFOSE (Surrogate Recovery)	%	103	80	69		NR70
4:2 FTS (Surrogate Recovery)	%	92	73	72		NR70
6:2 FTS (Surrogate Recovery)	%	96	86	77		NR70
8:2 FTS (Surrogate Recovery)	%	89	57	71		NR70
8:2 diPAP (Surrogate Recovery)	%	218	190	170		NR70
Dates						
Date extracted		12-MAY-2021	12-MAY-2021	12-MAY-2021		
Date analysed		14-MAY-2021	14-MAY-2021	14-MAY-2021		

N21/011711
to
N21/011713

REPORT OF ANALYSIS

PFOS and PFHxS are quantified using a combined branched and linear standard, linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

Selected PFAS surrogate recoveries are biased due to matrix effects.ô
High PFAS surrogate recoveries accepted - results corrected for recovery.

[redacted]

[redacted]
Organics - NSW
Accreditation No. 198

14-MAY-2021

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1314229*

Measurement Uncertainty is available upon request.
Chemical Accreditation 198: 105 Delhi Road, North Ryde, NSW, 2113

Australian Government
Department of Industry, Science, Energy and Resources

National Measurement Institute

SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [redacted]

Customer: AECOM SERVICES PTY LTD

Address: 34 MCLACHLAN STREET
DARWIN NT 900

Email: [redacted]

Telephone:

Fax:

LABORATORY DETAILS

Lab: National Measurement Institute

Contact: [redacted]

Address: 105 Delhi Road, North Ryde, NSW
NSW 2113

Email: [redacted]

Telephone: [redacted]

Fax:

SAMPLE DETAILS

NMI Job Name: **AECO09/210510**

Total No. of Samples: **1**

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N21/011735	17-MAY-2021	1302_QC204_210506	WATER 6/5/21 12:07

SAMPLE RECEIVED CONDITION

Date samples received: 10-MAY-2021

Sample received in good order: Yes

NMI Quotation no. provided:

Client purchase order number: 60612561

Temperature of samples: Chilled

Comments: ALL OK

Mode of Delivery: Courier

Additional Terms and Conditions

Incomplete / unclear information about samples or required testing will delay the start of the analysis work

If you require your Purchase Order (PO) number to be included on our invoice, please provide the number during sample submission and before the completion of work to avoid unnecessary delays and/or additional processing/handling fees.

The lodgement of an order or receipt of samples for NMI services referenced in this Sample Receipt Notification constitutes an acceptence of the current version of NMI Terms and Conditions or other applicable Terms referenced in the NMI Quotation. NMI Terms and Conditions are available on the web at
https://www.industry.gov.au/client-services/testing-and-analysis-services/chemical-and-biological-analysis-services-terms-and-conditions

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO09/210507 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	112	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	109	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	104	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	104	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	102	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	119	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	105	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	114	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	118	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	105	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	114	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	116	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	114	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	114	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	105	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	110	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	106	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	104	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	105	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	124	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	102	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	100	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	96	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	132	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	104	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	113	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	106	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	112	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	109	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference.

Signed: [redacted]

[redacted]
Organics Manager, NMI-North Ryde

Date: **14/05/2021**

REPORT OF ANALYSIS

Report No. RN1314391

Client	: AECOM SERVICES PTY LTD	**Job No.**	: AECO09/210510
	34 MCLACHLAN STREET	**Quote No.**	: QT-02018
	DARWIN NT 900	**Order No.**	: 60612561
		Date Received	: 10-MAY-2021
Attention	: AZRAI PARISHPERANDIS	**Sampled By**	: CLIENT
Project Name	: NT_1302_PFASOMP		
Your Client Services Manager	: Tim Reddan	**Phone**	: 03 9644 4854

Lab Reg No.	Sample Ref	Sample Description
N21/011735	1302_QC204_210506	WATER 6/5/21 12:07

Lab Reg No.		N21/011735				
Date Sampled		06-MAY-2021				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	0.057				NR70
PFPeA (2706-90-3)	ug/L	0.092				NR70
PFHxA (307-24-4)	ug/L	0.34				NR70
PFHpA (375-85-9)	ug/L	0.051				NR70
PFOA (335-67-1)	ug/L	0.11				NR70
PFNA (375-95-1)	ug/L	<0.01				NR70
PFDA (335-76-2)	ug/L	<0.01				NR70
PFUdA (2058-94-8)	ug/L	<0.01				NR70
PFDoA (307-55-1)	ug/L	<0.01				NR70
PFTrDA (72629-94-8)	ug/L	<0.02				NR70
PFTeDA (376-06-7)	ug/L	<0.02				NR70
PFHxDA (67905-19-5)	ug/L	<0.02				NR70
PFODA (16517-11-6)	ug/L	<0.05				NR70
FOUEA (70887-84-2)	ug/L	<0.01				NR70
PFDS (335-77-3)	ug/L	<0.01				NR70
PFPeS (2706-91-4)	ug/L	0.18				NR70
PFHxS (355-46-4)	ug/L	1.9				NR70
PFHpS (375-92-8)	ug/L	0.092				NR70
PFOS (1763-23-1)	ug/L	3.3				NR70
PFNS (68259-12-1)	ug/L	<0.01				NR70
PFBS (375-73-5)	ug/L	0.18				NR70
PFOSA (754-91-6)	ug/L	<0.01				NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02				NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02				NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01				NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01				NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05				NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05				NR70
4:2 FTS (757124-72-4)	ug/L	<0.01				NR70
6:2 FTS (27619-97-2)	ug/L	0.023				NR70

REPORT OF ANALYSIS

Lab Reg No.		N21/011735				
Date Sampled		06-MAY-2021				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
8:2 FTS (39108-34-4)	ug/L	<0.01				NR70
10:2 FTS (120226-60-0)	ug/L	<0.01				NR70
8:2 diPAP (678-41-1)	ug/L	<0.02				NR70
PFBA (Surrogate Recovery)	%	100				NR70
PFPeA (Surrogate Recovery)	%	103				NR70
PFHxA (Surrogate Recovery)	%	108				NR70
PFHpA (Surrogate Recovery)	%	104				NR70
PFOA (Surrogate Recovery)	%	104				NR70
PFNA (Surrogate Recovery)	%	92				NR70
PFDA (Surrogate Recovery)	%	90				NR70
PFUdA (Surrogate Recovery)	%	98				NR70
PFDoA (Surrogate Recovery)	%	95				NR70
PFTeDA (Surrogate Recovery)	%	76				NR70
PFHxDA (Surrogate Recovery)	%	67				NR70
FOUEA (Surrogate Recovery)	%	81				NR70
PFBS (Surrogate Recovery)	%	94				NR70
PFHxS (Surrogate Recovery)	%	92				NR70
PFOS (Surrogate Recovery)	%	93				NR70
PFOSA (Surrogate Recovery)	%	83				NR70
N-MeFOSA (Surrogate Recovery)	%	80				NR70
N-EtFOSA (Surrogate Recovery)	%	72				NR70
N-MeFOSAA (Surrogate Recovery)	%	84				NR70
N-EtFOSAA (Surrogate Recovery)	%	106				NR70
N-MeFOSE (Surrogate Recovery)	%	78				NR70
N-EtFOSE (Surrogate Recovery)	%	126				NR70
4:2 FTS (Surrogate Recovery)	%	82				NR70
6:2 FTS (Surrogate Recovery)	%	79				NR70
8:2 FTS (Surrogate Recovery)	%	85				NR70
8:2 diPAP (Surrogate Recovery)	%	100				NR70
Dates						
Date extracted		12-MAY-2021				
Date analysed		14-MAY-2021				

N21/011735
PFOS and PFHxS are quantified using a combined branched and linear standard,
linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

REPORT OF ANALYSIS

Report No. RN1314391

Lab Reg No.		N21/011735				
Date Sampled		06-MAY-2021				
	Units					Method

[redacted]

[redacted]

Organics - NSW
Accreditation No. 198

17-MAY-2021

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Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1314378*

Measurement Uncertainty is available upon request.
Chemical Accreditation 198: 105 Delhi Road, North Ryde, NSW, 2113

Appendix G

Calibration Certificates

Appendix G Calibration Certificates

AECOM Imagine it. Delivered.

AECOM Australia Pty Ltd
34 McLachlan Street
Darwin NT 0800
GPO Box 3175
Darwin NT 0801
Australia
www.aecom.com

+61 8 8942 6200 tel
+61 8 8942 6299 fax
ABN 20 093 846 925

Equipment Information

Instrument:

Serial Number:

Equipment Check

	Enclosed	Comment
YSI Pro Plus Display	☑	
YSI Quatro Sonde	☑	
- YSI 1001 pH Probe	☑	
- YSI 1002 ORP Probe	☑	
- YSI 5560 Cond/Temp Probe	☑	
- YSI Polarographic DO Sensor	☑	
Flow Cell & Attachments (x2)	☑	
Probe Guard	☑	
Rubber Storage/Calibration Sleeve	☑	
Calibration Cup + Cap	☑	
YSI Cable Management Kit	☑	
YSI Pro Series ProComm II Kit	☐	NA
User Manual + Flow Cell Manual	☐	NA
Spare Batteries (x2) & Screwdriver	☑	
Laminated Quick Start Guide	☑	

Sensor Calibration Details

	Calibration Undertaken	Accuracy	Pass	Fail
Temperature	Factory Calibrated	±0.2°C	☑	☐
Dissolved Oxygen	☐ 100% Saturation	±2%	☐	☐
	Pressure Compensation ____hPa		☐	☐
Conductivity	☑ 12.88mS/cm	±0.5%	☑	☐
	☑ Check linearity at 1.413mS/cm	±0.5%	☑	☐
Salinity	Auto Calibrated	±1%	☑	☐
pH	☑ pH 7.00	± 0.2	☑	☐
	☑ pH 4	± 0.2	☑	☐
	☑ pH 10			
ORP	☑ 265 mV at 26 °C	±20mV	☑	☐

This is to certify that where possible, this instrument has been calibrated in accordance with the manufacturer's calibration procedure as recommended in the instrument service manual.

Name: [redacted]

Signature: [redacted] .....

Date: 28/4/21

AECOM Imagine it. Delivered.

AECOM Australia Pty Ltd
34 McLachlan Street
Darwin NT 0800
GPO Box 3175
Darwin NT 0801
Australia
www.aecom.com

+61 8 8942 6200 tel
+61 8 8942 6299 fax
ABN 20 093 846 925

[redacted]

Equipment Information

Instrument:

Serial Number:

Equipment Check

	Enclosed	Comment
YSI Pro Plus Display	☑	
YSI Quatro Sonde	☑	
- YSI 1001 pH Probe	☑	
- YSI 1002 ORP Probe	☑	
- YSI 5560 Cond/Temp Probe	☑	
- YSI Polarographic DO Sensor	☑	
Flow Cell & Attachments (x2)	☑	
Probe Guard	☑	
Rubber Storage/Calibration Sleeve	☑	
Calibration Cup + Cap	☑	
YSI Cable Management Kit	☑	
YSI Pro Series ProComm II Kit	☑	
User Manual + Flow Cell Manual	☑	
Spare Batteries (x2) & Screwdriver	☑	
Laminated Quick Start Guide	☑	

Sensor Calibration Details

	Calibration Undertaken	Accuracy	Pass	Fail
Temperature	Factory Calibrated	±0.2°C	☑	☐
Dissolved Oxygen	☑ 100% Saturation	±2%	☑	☐
	Pressure Compensation ____hPa		☑	☐
Conductivity	☑ 12.88mS/cm	±0.5%	☑	☐
	☑ Check linearity at 1.413mS/cm	±0.5%	☑	☐
Salinity	Auto Calibrated	±1%	☑	☐
pH	☑ pH 7.00	± 0.2	☑	☐
	☑ pH 4	± 0.2	☑	☐
	☑ pH 10			
ORP	☑ 245 mV at 26 °C	±20mV	☑	☐

This is to certify that where possible, this instrument has been calibrated in accordance with the manufacturer's calibration procedure as recommended in the instrument service manual.

Name: [redacted]

Signature: [redacted] .....

Date: 6/5/2021

Prepared for
Department of Defence, Directorate of PFAS Remediation, Environment and Engineering Branch
ABN: 68706814312

AECOM

Sampling Event Factual Report, November 2021

PFAS OMP - RAAF Base Darwin

13-Apr-2022
RAAF Base Darwin

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Sampling Event Factual Report, November 2021

PFAS OMP - RAAF Base Darwin

Client: Department of Defence, Directorate of PFAS Remediation, Environment and Engineering Branch

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Prepared by

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Quality Information

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A	09/02/2022	Draft for Review	James Guzman Project Manager	
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List of Tables (in Text)

Abbreviations

Abbreviation	Term
AECOM	AECOM Australia Pty Ltd
ALS	ALS Environmental Pty Ltd
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999
BOM	Bureau of Meteorology
DCMM	Defence Contamination Management Manual
Defence	Department of Defence
DO	Dissolved Oxygen
DoH	Department of Health
DIA	Darwin International Airport
DQOs/DQIs	Data Quality Objectives/Data Quality Indicators
EC	Electrical Conductivity
HEPA	Heads of Environment Protection Authority
LOR	Limit of Reporting
LNAPL	Light Non-Aqueous Phase Liquid
mAHD	meters Australian Height Datum
mbtoc	metres below top of casing
MW	Monitoring Well
NATA	National Association of Testing Authorities
NEMP	National Environmental Management Plan
NEPC	National Environment Protection Council
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
NT	Northern Territory
NTU	Nephelometric Turbidity Unit
NSW	New South Wales
OMP	Ongoing Monitoring Program
ORP	Oxidation Reduction Potential
PFAS	Per- and poly-fluoroalkyl substances
PFHxS	Perfluorohexanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance and Quality Control
RAAF	Royal Australian Air Force
SAQP	Sampling and Analysis Quality Plan
SW	Surface Water
km	kilometre
m	metre
g	gram
L	litre

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Program (OMP) outlined in the *PFAS Management Area Plan (PMAP)* (Department of Defence, 2019a) at RAAF Base Darwin (the 'Site') in the Northern Territory. The location of the Site and Management Area is shown in **Figure 1** in **Appendix A**. The OMP (Department of Defence, 2019a) for the Site outlines the requirement to complete annual biota sampling and biannual groundwater and surface water sampling.

The primary purpose of the OMP program is to monitor changes to the PFAS impact in groundwater and surface water pathways associated with sources of PFAS as initially assessed through the detailed site investigation phase of works. Changes may result from the specific or cumulative impact of remediation or containment actions, existing transportation trends, and changes to hydrogeology or weather events.

The monitoring program at RAAF Base Darwin includes a regime of groundwater, surface water and biota sampling to capture these changes in the long term, to enable Defence to maintain an up-to-date understanding of temporal and spatial distribution, concentration and transport of PFAS contaminants.

1.2 Objectives

The objective of the OMP is to provide information on changes to PFAS contamination originating from Defence property to inform risk management decisions by Defence and Territory agencies to protect human health and the environment.

The purpose of this PFAS OMP factual report is to summarise the scope of works and findings for the November 2021 groundwater sampling event, conducted in accordance with the Sampling and Analysis Quality Plan (SAQP) (AECOM, 2021).

While biota sampling was conducted in conjunction with the groundwater sampling works, sample preparation and analysis was delayed due to COVID-19 restrictions, and this work will be reported at a later date.

This report has been prepared in accordance with the *PFAS OMP Factual Report Guidance,* v0.2, May 2021 (Department of Defence, 2021).

An annual interpretive report will be subsequently developed for the purpose of assessing the data collected during the discrete monitoring events completed over the preceding 12-month period and will include assessment of environmental variability and any statistically significant trends in PFAS concentrations.

2.0 Scope of work

The groundwater sampling event was completed in general accordance with the SAQP (AECOM, 2021).

Prior to commencement of the sampling events, the SAQP was reviewed to ensure compliance with the following:

- The OMP (Department of Defence, 2019a)
- PFAS National Environmental Management Plan (NEMP) (HEPA, 2020)
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM)
- Defence Routine Environment Water Quality Monitoring Manual (Department of Defence, 2019b)
- AS/NZ 5667:1998 Water quality – Sampling (AS/NZS, 1998)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC, 2018); and
- Relevant Territory regulatory guidelines.

In summary, the scope of works for this sampling event, conducted in November 2021, included:

- Gauging of groundwater levels at 30 existing monitoring wells and collection of groundwater samples (using Hydrasleeves™) from 28 monitoring wells (refer to **Table 1** below, and **Figure 2** in **Appendix A** for specific locations). It is noted that two monitoring wells could not be sampled during this sampling event as they gauged dry; refer to **Table 7** for more details.
- Collection of intra- and inter-laboratory duplicate samples at a rate of 1 in 10 primary samples, one rinsate and one field blank sample per fieldwork day for groundwater.
- Analysis of groundwater samples for a suite of 28 PFAS analytes at the standard limit of reporting (LOR).
- Data management of the OMP field and laboratory data in the Defence ESdat database.
- Preparation of this Sampling Event Factual Report.

2.1 Planned monitoring locations

The monitoring locations outlined within the Sampling Analysis and Quality Plan (SAQP) for the groundwater sampling event are outlined below:

Table 1 Groundwater sampling locations

Area	Description	Sampling locations	Number of wells/bores	Total
On site	Former fuel farm 1	MW215	1	18 locations
	Former fuel farm 5	MW297, MW112	2	
	Former fuel farms	MW303, MW133, MW205	3	
	Former fire training area 1	MW422, MW139	2	
	Current fire training area	MW240**, MW241**	2	
	RAAF fire station	MW103	1	
	Former ARFF fire station	MW115	1	
	Source area downgradient transect	MW107, MW128	2	

Area	Description	Sampling locations	Number of wells/bores	Total
	Southern boundary of site	MW141, MW144	2	
	Western boundary of site	MW148*	1	
	Rapid Creek – eastern end	MW156	1	
Off site	Former fire training area 2, Darwin International Airport (DIA)	MW197	1	12 locations
	Off-base (north)	MW185	1	
	Rapid Creek	MW190, MW191, MW194, MW195	4	
	Off-base (south)	MW176, MW180, MW200, MW209	4	
	Off-base (south west)	MW211	1	
	Off-base (west)	MW210	1	

* Contingency location MW201 sampled in lieu of MW148 due to damage to the PVC casing and removal of the insitu Hydrasleeve .

** Wells gauged dry and were not sampled.

2.2 Deviations from the SAQP

The works completed during this sampling event included some deviations from the SAQP (AECOM, 2021) as outlined below in **Table 2**.

Table 2 Deviations from the SAQP during sampling event for November and December 2021

SAQP	November and December sampling event	Impact on OMP
Proposed annual schedule for sampling and reporting	During the November and December sampling event, NT Fisheries were successful in collecting and completing the aquatic biota for the RAAF Darwin as outlined in the SAQP (AECOM, 2021). However, due to Covid-19 restrictions placed by the NT Government restrictions the scheduled aquatic biologist who leads biota sample processing could not travel interstate. The samples have been frozen until January when the processing is planned to be undertaken.	The results from the November and December biota sampling event will be reported in the mid-late wet season reporting period (January-March 2022).

3.0 Sampling methodology

3.1 Groundwater methodology

The methodology adopted for the biannual groundwater sampling event in November 2021 was in accordance with the SAQP (AECOM, 2021) and is summarised below in **Table 3**:

Table 3 Sampling methodology

Item	Details
Groundwater gauging	The depth to groundwater was measured in each monitoring well immediately prior to collection of groundwater samples using an interface probe.
Field parameters	Where appropriate, groundwater field parameters were recorded ex-situ, using a daily calibrated YSI Pro Water Quality Meter (refer to **Appendix G** for calibration certificate). Parameters recorded consisted of the following: Temperature (°C), electrical conductivity (EC), dissolved oxygen (DO), oxidation-reduction potential (ORP) and pH. Observations of odour, colour and clarity (turbidity) of groundwater was recorded at each site.
Sampling methodology	Groundwater samples were collected from all accessible wells using no-purge methodology HydraSleeves™, which were installed within the screened interval of the wells for a minimum of 24 hours prior to the sampling. This was based on a review of the well construction log.
QAQC samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits) and rinsate samples. Refer to **Appendix D** for assessment of QAQC sample data.
Sample analysis	Samples were submitted to the primary and secondary laboratories for analysis detailed in **Section 3.0**. ALS Environmental (ALS) Sydney, NSW was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for analyses were certified by the National Association of Testing Authorities (NATA). Chain of custody and laboratory certificates are presented in **Appendix E** and **Appendix F**, respectively.

3.2 Adopted screening criteria

Screening criteria were selected on the basis of national guidance in the form of the PFAS National Environmental Management Plan, Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset includes the following:

- Department of Health (DoH), 2019. Health Based Guidance Values for PFAS for use in site investigations in Australia. April 2017 [updated September 2019].
- Heads of the Environment Protection Authority (HEPA), (2020), PFAS National Environmental Management Plan (NEMP). January 2020.

The adopted screening criteria which have been adopted for groundwater are presented **Table 4**.

Table 4 Summary of adopted screening criteria for groundwater consumption

Pathway	Compound	Criteria	Comment/reference
Human health receptors			
Drinking water - groundwater	PFOS + PFHxS	0.07 µg/L	These values are from the PFAS NEMP (HEPA, 2020). *All groundwater results will be compared to these criteria.*
	PFOA	0.56 µg/L	

3.3 Data quality objectives and data validation

The data quality objectives (DQOs) and data quality indicators (DQIs) adopted for these works are presented in the SAQP (AECOM, 2021).

Data validation assessment is provided in **Appendix D**.

Data validation procedure employed in the assessment of the field and laboratory QA/QC data are indicative that the overall quality of the analytical data produced is acceptably reliable for the purpose of this report.

All data collected during this event has been reviewed and uploaded to the Defence ESdat database in accordance with Defence Contamination Management Manual (DCMM) (Defence, 2018 as amended 2019) Annex L requirements.

4.0 Field observations and results

4.1 General field observations

The following field observations were applicable across the entirety of the sampling event.

Table 5 General field observations

Item	Observation
Weather conditions	Weather for the groundwater event was observed to be partly cloudy, hot, and humid during the sampling event. Temperature ranged from 30.1°C to 34°C, and medium to high relative humidity from 57 percent – 74 percent. No precipitation was recorded on 9 and 10 November and 2.0mm on the 11 November 2021. (Darwin Airport weather station, 014015) (BOM, 2021).
Estate management works or training activities	During the sampling event, no notable estate works, or training activities were observed in the vicinity of sampling locations with the exception of the following: • Current AIR7000 construction activities. • Airforce flying associated training activities were being undertaken. This did not detrimentally interfere with the sampling program; however, minor delays were presented.

4.2 Groundwater results

4.2.1 Field observations and field measurements

Table 6 Groundwater observations and field measurements

Item	Observations and field measurements
Fieldwork dates	The groundwater sampling was completed between 9 and 11 November 2021. .
Access and sample collection	All monitoring wells and bores were accessible and able to be sampled with the exception of the following: • Monitoring well MW148 was not sampled due to having a bent casing which precluded retrieval of the Hydrasleeve™. A depth to water measurement was taken, and the identified contingency well (MW201) was sampled in lieu • Monitoring well MW240 was dry • Monitoring well MW241 was dry It should be noted that MW240 and MW241 did not have identified contingency locations available.
Monitoring well network condition	The monitoring well network was generally in good condition and with the exception of MW148 – bent PVC casing pipe, unable to retrieve Hydrasleeve™.
Field observations	Monitoring wells MW303, MW292 and MW297 located near the fuel tank farms on Bombing Road were observed to emit a hydrocarbon odour. Notably, MW303 had a 1mm thickness LNAPL (Light Non-Aqueous Phase Liquid) layer was observed in MW303, and a 5mm LNAPL layer in MW297.

Item	Observations and field measurements
Depth to groundwater and flow direction	Depth to groundwater was recorded from 29 of 31 wells visited, ranging from 1.66 (MW209) to 11.97 (MW241) metres below top of casing (m btoc). Groundwater elevations in the aquifer were between 3.44 (MW185) and 24.10 (MW115) metres Australian Height Datum (mAHD). Groundwater gauging data is presented in **Table C1** in **Appendix C**. Inferred groundwater contours and groundwater flow directions at the Site in November 2021 are shown on **Figure 3** in **Appendix A**. A localised high point is located in the centre of the Base, south of the runway, with the groundwater flow radiating from this location. Groundwater in the north and west portions of the Base is inferred to generally flow north west towards the coast, with localised flow towards Ludmilla Creek on the western boundary of the Base and Rapid Creek north of the Base. Groundwater to the south of the site is inferred to flow towards Charles Darwin National Park and Francis Bay. Groundwater contours are generally consistent with the Detailed Site Investigation (Coffey, 2018) flow direction.
Geochemical parameters	Groundwater geochemical parameters was measured during sample collection from the HydraSleeve™ using a sterilised YSI cup and YSI Pro Water Quality Meter. The readings are presented in **Table B1** in **Appendix B**, and YSI calibration certificate in **Appendix G**) and are summarised below: • DO ranged from 0.44 mg/L (MW107) to 3.84 mg/L (MW115). • EC ranged from 23.6 µS/cm (MW194) to 63307 µS/cm (MW201). The majority of readings were below 100 µS/cm indicating generally low salinity, with higher salinity generally at lower groundwater elevations around the perimeter of the monitoring network. • pH ranged from 3.94 (MW201) to 8.60 (MW115) indicating acidic to slightly alkaline conditions. • ORP (corrected) ranged from 215.56 mV (MW133) to 495.96 mV (MW139) indicating reducing conditions.

4.2.2 PFAS groundwater analytical results

During this sampling event, 27 of the 28 groundwater locations sampled reported concentrations of PFAS above the laboratory limits of reporting (LOR).

There were no first-time exceedances at any of the sampled groundwater monitoring locations.

The PFAS groundwater analytical results from the November 2021 sampling event are presented in **Table B1** in **Appendix B.**

Table 7 First time detections of PFAS and exceedances of guidelines in groundwater

Type	Location ID	Sum of PFHxS + PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFOS concentration (µg/L)	
		November 2021	Historical maximum	November 2021	Historical maximum	November 2021	Historical maximum
First time detections of Sum of PFHxS+PFOS, PFOS or PFOA in groundwater.	There were no first-time detections of PFHxS+PFOS, PFOS or PFOA during this sampling event.						

Type	Location ID	Sum of PFHxS + PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFOS concentration (µg/L)	
		November 2021	Historical maximum	November 2021	Historical maximum	November 2021	Historical maximum
First time exceedance of human health criteria for sum of PFHxS+PFOS or PFOA in groundwater.	There were no first-time exceedances of human health criteria for sum of PFHxS+PFOS or PFOA in groundwater during this sampling event						
First time exceedance of ecological criteria for PFOS or PFOA in groundwater	There were no first-time exceedances of ecological criteria for PFOS or PFOA in groundwater during this sampling event						

5.0 Summary and next sampling events

5.1 Summary of monitoring event

The annual and bi-annual groundwater monitoring event was completed at the Site and publicly accessible land within the Management Area between 9 and 11 November 2021. The program included sampling of groundwater from 28 of a planned 30 monitoring wells. Monitoring wells MW240 and MW241 presented as dry. Contingency location MW201 was sampled in lieu of MW148 which was found to be damaged.

While biota sampling was conducted, sample preparation and analysis was delayed due to COVID restrictions. Analytical results for aquatic biota sampling will be reported with the release of the April 2022 report.

The findings of the November 2021 groundwater sampling event and the recommended actions are summarised in **Table 9** below.

Table 8 Summary of sampling event

Item	Comment	Recommended actions
Access to sampling locations	All proposed monitoring locations were accessible.	No actions recommended.
Monitoring well network condition	Monitoring well MW148 was unable to be sampled due to damage to the standpipe and casing. Given that sufficient coverage will be provided by monitoring wells MW201 (contingency location) it is not anticipated that this will affect the continued implementation of the OMP.	Replace monitoring well MW148 with PMAP recommended alternative well MW201.
Analytical Results	PFAS concentrations were recorded above the LOR at 27 of 28 groundwater monitoring wells.	Ongoing monitoring in accordance with OMP.
First time exceedance of NEMP drinking water guideline values in groundwater	No locations reported first time detections.	No actions recommended.
First time detection of PFAS in groundwater	No locations reported first time detections.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show an increasing trend in groundwater and surface water [1]	This will be evaluated in the annual interpretive report.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show a decreasing trend in groundwater and surface water [2]	This will be evaluated in the annual interpretive report.	No actions recommended.

5.2 Upcoming sampling events

The next biannual sampling event is scheduled for April 2022. Biota samples are to be analysed and analytical results to be included within the next factual report.

5.3 Upcoming annual interpretive report

The next annual interpretive report is scheduled to be delivered in July 2022.

6.0 References

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Appendix A

Figures

Appendix A Figures

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.5 1 2

Kilometres

1:45,000 (when printed at A3)

Legend

- Drainage
- Highway
- Management Area
- RAAF Base Darwin
- Source Area

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 Esri

Department of Defence
RAAF BASE DARWIN
PFAS OMP
FACTUAL REPORT
November 2021
Site and Management Area

PROJECT ID 60612561
CREATED BY [redacted]
LAST MODIFIED [redacted]021
VERSION: 1

Figure 01

Filename: \[redacted]

A3 size

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 100 200 400 600 800

Metres

1:20,000 (when printed at A3)

Legend

- Groundwater Monitoring Location
- Destroyed Groundwater Monitoring Location
- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2021 Nearmap

Department of Defence
RAAF BASE DARWIN
PFAS OMP
FACTUAL REPORT
November 2021
Groundwater Sampling Locations

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VERSION: 1

Figure 02

Filename: [redacted]

A3 size

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000

Metres

1:20,000 (when printed at A3)

Legend

- Groundwater Monitoring Location
- Dry Sample Location
- Not Sampled

Id

- Inferred Groundwater Level
- Inferred Groundwater Direction
- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2021 Nearmap

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PFAS OMP
FACTUAL REPORT
November 2021
Inferred Groundwater Contours

PROJECT ID 60612561
CREATED BY [redacted]
LAST MODIFIED [redacted]
VERSION: 1

Figure 03

Filename: [redacted]

A3 size

Appendix B

Tables

Appendix B Tables

Table B1
Groundwater Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

AECOM

					PFAS Full Suite																														
					10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	Perfluorobutane sulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanesulfonic acid (PFDS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (FOSA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Sum of PFAS	Sum of PFHxS and PFOS	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorohexane sulfonic acid (PFHxS)
					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	µg/L
		LOR			0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01	0.01	0.01
Ecological Receptors	PFAS NEMP 2020 Freshwater 99%																															0.00023	19		
Human Health Receptors	PFAS NEMP 2020 Drinking Water																														0.07		0.56		
	PFAS NEMP 2020 Recreational Water																														2		10		
Location Code	**Field ID**	**Date**	**Lab Report**	**Sample Type**																															
MW103	1302_MW103_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.69	0.1	<0.02	<0.02	<0.02	0.65	0.26	2.42	<0.02	<0.02	0.96	0.31	<0.05	<0.02	<0.02	49.9	**43.8**	**33.2**	**0.69**	10.6
	1302_QC102_211111	11-11-21	ES2141185	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.67	0.1	<0.02	<0.02	<0.02	0.63	0.25	2.33	<0.02	<0.02	0.94	0.31	<0.05	<0.02	<0.02	47.7	**41.8**	**31**	**0.68**	10.8
	1302_QC202_211111	11-11-21	RN1334898	Interlab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.54	0.14	<0.01	<0.01	<0.01	0.37	0.2	1.4	0.013	<0.01	0.64	0.26	<0.02	<0.02	<0.01	35.46	**31.4**	**24**	0.51	7.4
MW107	1302_MW107_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.46	<0.1	<0.02	<0.02	<0.02	0.3	0.13	1.07	<0.02	<0.02	0.51	0.19	<0.05	<0.02	<0.02	16.1	**13.2**	**8.51**	0.27	4.7
MW112	1302_MW112_211110	10-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	0.06	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.43	<0.1	0.06	<0.02	<0.02	0.42	0.13	1.23	<0.02	0.05	0.55	0.16	<0.05	<0.02	<0.02	25.2	**21.8**	**18.2**	0.32	3.64
MW115	1302_MW115_211110	10-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.32	0.5	0.23	<0.02	<0.02	3.76	0.67	7.61	0.02	0.34	2.75	1.04	<0.05	<0.02	<0.02	111	**88.6**	**62.2**	**1.82**	26.4
MW128	1302_MW128_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	<0.1	<0.02	<0.02	<0.02	0.13	0.07	0.53	<0.02	<0.02	0.21	0.11	<0.05	<0.02	<0.02	8.88	**7.5**	**5.35**	0.12	2.15
MW133	1302_MW133_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	0.15	0.06	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.62	0.1	0.03	<0.02	<0.02	0.74	0.22	3.02	<0.02	0.04	0.64	0.39	<0.05	<0.02	<0.02	42.2	**35.7**	**28.5**	0.54	7.16
MW139	1302_MW139_211110	10-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.14	<0.02	<0.02	0.07	0.02	<0.05	<0.02	<0.02	2.63	**2.26**	**1.7**	0.03	0.56
MW141	1302_MW141_211110	10-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.32	**0.32**	**0.16**	<0.01	0.16
MW144	1302_MW144_211110	09-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	<0.1	<0.02	<0.02	<0.02	0.12	0.04	0.39	<0.02	<0.02	0.21	0.06	<0.05	<0.02	<0.02	6.83	**5.71**	**3.98**	0.09	1.73
	1302_QC101_211110	10-11-21	ES2141185	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	<0.1	<0.02	<0.02	<0.02	0.12	0.04	0.39	<0.02	<0.02	0.25	0.05	<0.05	<0.02	<0.02	6.41	**5.24**	**3.42**	0.1	1.82
	1302_QC201_211110	10-11-21	RN1334898	Interlab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.17	<0.05	<0.01	<0.01	<0.01	0.071	0.028	0.25	<0.01	<0.01	0.16	0.055	<0.02	<0.02	<0.01	5.102	**4.3**	**2.8**	0.068	1.5
MW156	1302_MW156_211110	10-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	<0.1	<0.02	<0.02	<0.02	0.09	0.03	0.32	<0.02	<0.02	0.17	0.04	<0.05	<0.02	<0.02	5.66	**4.79**	**3.35**	0.07	1.44
MW176	1302_MW176_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.13	**0.13**	**0.09**	<0.01	0.04
	1302_QC103_211111	11-11-21	ES2141185	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.11	**0.11**	**0.07**	<0.01	0.04
	1302_QC203_211111	11-11-21	RN1335723	Interlab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.086	**0.09**	**0.055**	<0.01	0.031
MW180	1302_MW180_211110	10-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.08	**0.08**	**0.01**	<0.01	0.07
MW185	1302_MW185_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.23	**0.2**	**0.1**	0.01	0.1
MW190	1302_MW190_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.08	0.05	0.46	<0.02	<0.02	0.14	0.09	<0.05	<0.02	<0.02	4.94	**3.9**	**2.54**	0.08	1.36
MW191	1302_MW191_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.17	<0.02	<0.02	0.05	0.04	<0.05	<0.02	<0.02	2.39	**2.01**	**1.37**	0.04	0.64
MW194	1302_MW194_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	<0.1	<0.02	<0.02	<0.02	0.08	0.04	0.33	<0.02	<0.02	0.14	0.07	<0.05	<0.02	<0.02	5.57	**4.65**	**3.51**	0.08	1.14
MW195	1302_MW195_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.07	<0.02	<0.02	0.08	<0.02	<0.05	<0.02	<0.02	2.07	**1.77**	**1.04**	0.02	0.73
MW197	1302_MW197_211109	09-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	<0.1	<0.02	<0.02	<0.02	0.29	0.06	0.56	<0.02	<0.02	0.28	0.08	<0.05	<0.02	<0.02	11.2	**9.61**	**6.68**	0.16	2.93
MW200	1302_MW200_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.13	<0.02	<0.02	0.08	0.02	<0.05	<0.02	<0.02	2.17	**1.78**	**1.04**	0.03	0.74
MW201	1302_MW201_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.08	**0.08**	**0.07**	<0.01	0.01
MW205	1302_MW205_211110	10-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.26	<0.1	<0.02	<0.02	<0.02	0.15	0.05	0.42	<0.02	<0.02	0.31	0.06	<0.05	<0.02	<0.02	8.25	**6.88**	**4.64**	0.12	2.24
MW209	1302_MW209_211110	10-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01
MW210	1302_MW210_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.02	0.03	0.02	<0.05	<0.02	<0.02	1.68	**1.49**	**1.1**	0.02	0.39
MW211	1302_MW211_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.36	**0.36**	**0.22**	<0.01	0.14
MW215	1302_MW215_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.19	<0.1	<0.02	<0.02	<0.02	0.14	0.06	0.39	<0.02	<0.02	0.17	0.11	<0.05	<0.02	<0.02	8.43	**7.26**	**5.45**	0.11	1.81
MW297	1302_MW297_211111	11-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.18	<0.1	0.06	<0.02	<0.02	1.18	0.45	3.71	<0.02	0.02	0.9	0.52	<0.05	<0.02	<0.02	47.1	**38.1**	**28.3**	**1.04**	9.76
MW303	1302_MW303_211109	09-11-21	ES2141185	Normal	<0.05	<0.05	0.11	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	6.58	1.1	0.02	<0.02	<0.02	2.04	1.55	14.5	<0.02	0.05	7.08	1.98	<0.05	<0.02	<0.02	134	**95.6**	**54.3**	**3.34**	41.3
MW422	1302_MW422_211110	10-11-21	ES2141185	Normal	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	4.44	1	0.11	<0.02	<0.02	3.43	0.88	11	0.04	0.05	3.22	1.8	<0.05	<0.02	<0.02	100	**73**	**45.6**	**1.56**	27.4

Notes:
µg/L: micrograms per litre
LOR: limit of reporting
* LOR is above guideline value
Denotes first time detection above LOR for Sum of PFHxS+PFOS or PFOA
Denotes new exceedance of human health or ecological screening criteria

Appendix C

Sampling Logs

Appendix C Sampling Logs

AECOM

Table C1: Groundwater Field Parameters

Location ID	Screening Interval (m bgl)	Hydrasleeve Deployment Collar Depth (mbgl)	Sampled Date	Depth to Water (mbtoc)	Well Depth (mbtoc)	Water Elevation (mAHD)	TOC (mAHD)	Well Condition	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Redox (mV)	Redox (corr) (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sample Method/Comments
MW103	1-15	5.3	11-11-21	4.328	12.45	15.22	19.55	Good	1.14	72.3	47	5.30	133.4	334.9	31.5	Medium	Light Brown	No odour	Hydrasleeve
MW107	1-15	5	11-11-21	3.943	15.65	18.00	21.94	Good	0.44	57.1	37	4.97	91.8	293.6	31.1	Low	Light Brown	No odour	Hydrasleeve
MW112	1-15	9	10-11-21	7.918	14.00	19.05	26.97	Good	3.68	29.7	19	5.68	292.8	494.5	31.3	Low	Grey	No odour	Hydrasleeve
MW115	1-15	8	10-11-21	6.710	15.050	25.70	32.41	Good	3.84	63.1	41	8.60	294	495.7	31.3	Low	Light Brown	No odour	Hydrasleeve
MW128	1-15	3.2	11-11-21	2.270	14.77	9.12	11.39	Good	1.06	47.5	31	4.22	265.5	466.5	32.2	Low	Orange / Brown	No odour	Hydrasleeve
MW133	1-15	12.2	11-11-21	11.135	14.89	19.08	30.21	Good	0.68	89.6	58	7.92	14.1	215.6	31.6	Low	Grey	HC odour	Hydrasleeve
MW139	1-15	10.1	10-11-21	9.110	15.52	19.44	28.55	Good	3.75	29.9	19	3.95	294.2	496.0	31.2	Low	Light Brown	No odour	Hydrasleeve
MW141	1-15	12.3	10-11-21	11.351	15.98	18.75	30.10	Good	1.37	39.6	26	4.38	252.9	455.0	30.7	Low	Light Brown	No odour	Hydrasleeve
MW144	1-15	10.5	10-11-21	9.524	15.77	21.17	30.69	Good	2.54	57.8	38	4.51	256.5	457.3	32.5	Clear	Clear	No odour	Hydrasleeve
MW148	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Unable to sample; Bent PVC Casing
MW156	1-12	5.7	10-11-21	4.659	12.03	18.38	23.04	Good	1.64	30.5	20	4.72	280	482.4	30.3	Medium	Light Brown	No odour	Hydrasleeve
MW176	1-12	5.1	11-11-21	4.152	11.68	14.59	18.74	Good	1.78	75.5	49	4.92	212	413.4	31.7	Low	Orange / Brown	No odour	Hydrasleeve
MW180	1-15	13.5	11-11-21	12.544	15.00	16.52	29.06	Good	3.51	50.7	33	4.37	283	484.1	32.1	Low	Yellow / Brown	No odour	Hydrasleeve
MW185	1-12	3.8	11-11-21	2.795	10.50	3.03	5.82	Good	1.50	412.3	268	4.44	255.9	457.4	31.5	Low	Light Brown	No odour	Hydrasleeve
MW190	1-12	2.8	11-11-21	1.779	12.40	9.56	11.34	Good	1.57	58	38	4.54	254.4	454.4	33.6	Low	Light Brown	No odour	Hydrasleeve
MW191	1-12	5.1	11-11-21	4.029	12.72	6.88	10.91	Good	3.13	62.7	41	5.02	205.9	406.4	32.9	Low	Light Brown	No odour	Hydrasleeve
MW194	1-12	4.1	11-11-21	3.146	12.44	15.09	18.24	Good	2.00	23.6	15	4.27	258	458.7	32.6	Low	Light Brown	No odour	Hydrasleeve
MW195	1-12	3.4	11-11-21	2.351	11.28	14.39	16.74	Good	2.24	24.8	16	4.04	281.6	483.7	30.8	Low	Light Brown	No odour	Hydrasleeve
MW197	1-15	14.5	09-11-21	13.225	15.78	12.98	26.20	Good	2.72	105	68	6.65	214.3	416.3	30.9	Low	Light Grey	Slight Organic Odour	Hydrasleeve
MW200	1-12	7.5	11-11-21	6.501	11.73	19.73	26.23	Good	0.81	173.6	113	5.18	174.8	376.1	31.8	Low	Light Brown	No odour	Hydrasleeve
MW201	1-12	4	11-11-21	2.895	8.10	3.03	5.92	Good	1.03	63307	41150	3.94	275.4	476.0	32.7	Low	Orange / Brown	No odour	Hydrasleeve
MW205	1-15	10.5	10-11-21	9.563	14.95	18.18	27.75	Good	3.55	33.5	22	7.08	255	457.1	30.7	Low	Light Grey	No odour	Hydrasleeve
MW209	1-10	2.9	10-11-21	1.830	11.38	5.11	6.94	Good	1.01	838	545	4.97	94.8	296.6	31.2	Low	Light Brown	No odour	Hydrasleeve
MW210	1-10	3.4	11-11-21	2.338	11.59	4.57	6.91	Good	2.96	82.1	53	5.17	184.9	384.6	34	Low	Light Brown	No odour	Hydrasleeve
MW211	1.5-15	7.5	11-11-21	6.502	14.96	16.02	22.52	Good	1.22	2206	1434	4.93	217.3	418.8	31.6	Low	Orange / Brown	No odour	Hydrasleeve
MW215	1-15	7.1	11-11-21	6.041	15.20	20.28	26.32	Good	0.79	38.7	25	4.64	163.3	365.5	30.6	Medium	Orange / Brown	No odour	Hydrasleeve
MW240	1-15	Dry	Dry	Dry	15.00	-	25.60	Good	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW241	1-15	Dry	Dry	Dry	14.50	-	25.01	Good	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry	Dry
MW297	1-15	9.4	11-11-21	8.394	NAPL	21.14	29.53	Good	1.12	33.9	22	6.09	69.3	271.4	30.8	Clear	Clear	HC odour	Hydrasleeve. LNAPL level will affect depth to water level.
MW303	1-15	13.5	09-11-21	12.628	NAPL	19.31	31.94	Good	1.13	324.8	211	5.55	-16.7	183.6	33.1	Low	Light Brown	HC odour	Hydrasleeve. LNAPL level will affect depth to water level.
MW422	1-15	8.3	10-11-21	7.258	12.87	20.51	27.77	Good	2.95	30.7	20	4.30	266.6	467.1	32.9	Low	Light Brown	No odour	Hydrasleeve

Notes:
mbtoc: meters below top of casing
mAHD: meters Australian Height Datum
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
oC: degrees celcius
NA: not available

[redacted]

Appendix D

Data Validation Reports

Appendix D Data Validation Reports

DATA VALIDATION REPORT; WATER

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:** 23/11/2021	[redacted]
Site:	1302 – RAAF Base Darwin		
Matrix:	Water	**Data Verified by:**	[redacted]
Laboratory:	ALS; NMI	**Date:**	17/12/2021
Lab reference:	ES2141185; RN1334898, RN1335723		[redacted]

Key Findings:

The analytical data can be used as a basis for interpretation subject to the limitations outlined below:

- The potential exists for concentrations of PFOS to be below the LOR, but above the adopted freshwater species protection guideline should be taken into consideration when interpreting results.
- Elevated RPDs should be taken into consideration when interpreting data for PFHxS and sum of PFHxS & PFOS where close to guidelines.

Component		Outliers			Material impact on interpretation
		No	Yes	Comment	
Frequency of field quality assurance/quality control (QAQC)		✓			
Number of tests requested/reported		✓			
Sample handling/preservation/holding times			✓	1	No
Frequency of laboratory QA/QC		✓			
Limits of reporting (LOR)			✓	2	No
Blank analysis	Field blank	✓			
	Rinsate blank	✓			
	Trip blank	✓			
	Method blank	✓			
Field intra-laboratory relative percent differences (RPDs)		✓			
Field inter-laboratory RPDs			✓	3	No
Laboratory duplicate RPDs		✓			
Matrix spike (MS) % recoveries			✓	4	No
Laboratory control spike (LCS) % recoveries		✓			
Surrogate % recoveries		✓			
Other observations			✓	5	No

Comments	
1. Sample handling	Primary, duplicate and triplicate surface water samples were received preserved and chilled at the laboratory. The sample receipt temperatures for lab batches are as below: **Batch Number** / **Temperature** ES2141185 / 17.2°C RN1334898 / 17.2°C RN1335723 / Chilled The sample receipt temperatures for primary batch ES2141185 and inter-laboratory batch RN1334898 were outside the recommended range (<6°C). A sample receipt temperature was not recorded for the inter-laboratory duplicate samples in batch RN1335723, however an attempt to chill was noted. Potential degradation of analytes and under reporting must be taken into consideration. However, as the receipt temperature was below the ambient groundwater temperature at the time of sampling (~25ºC) and the samples were immediately cooled upon collection, this is not considered to significantly impact the interpretation of results.
2. Limits of reporting	Limits of reporting were sufficiently low to enable assessment against adopted guideline criteria, with the exception of PFOS. The potential exists for concentrations of key CoPC PFOS to be above the adopted freshwater species protection guideline, but below the laboratory LOR. This should be taken into consideration when interpreting data and using data quantitatively.
3. Field inter-laboratory duplicate RPDs	Field inter-laboratory duplicate RPDs were reported within control limits, with the exception of the following analytes (higher concentration in bold): - **1302_MW144_211110** & 1302_QC201_211110 for PFHxA (44%) - **1302_MW144_211110** & 1302_QC201_211110 for PFOS (35%) - **1302_MW103_211111** & 1302_QC202_211111 for PFHpS (55%) - **1302_MW103_211111** & 1302_QC202_211111 for PFHxA (53%) - **1302_MW103_211111** & 1302_QC202_211111 for PFPeS (40%) - **1302_MW103_211111** & 1302_QC202_211111 for sum of PFHxS & PFOS (32%) - **1302_MW103_211111** & 1302_QC202_211111 for PFHxS (36%) As there are no adopted guideline values for PFHxA, PFHpS, PFHxA, PFPeS and PFHxS the elevated RPDs are not expected to affect interpretation of results against guidelines. However, this apparent lack of precision should be taken into consideration when interpreting concentrations for sum of PFHxS & PFOS close to guidelines.
4. Matrix Spike Recoveries	Matrix spike (MS) recoveries (where reported) were within control limits. Matrix spike recoveries were not determined for PFHxS and PFOS as background levels were greater than or equal to 4x spike levels. These non-determinations do not reflect method bias and do not affect data interpretation. The accuracy of the data can be assessed as acceptable based on method blanks, LCS and surrogate spike recoveries (which were reported at or above the required frequencies and within control limits).
5. General Comments	EP231X: PFAS results for sample #34, #35 confirmed by re-extraction and re-analysis

Appendix E

Chain of Custody

Appendix E Chain of Custody

CHAIN OF CUSTODY

(ALS) COC#: **29824** *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: 1302_RAAFDarwin

SITE: 1302_RAAFDarwin

ORDER NO:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 15/11/21 9AM	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: 17.2 °C

Other comments:

Subcon / (Forward Lab) / Split WO

Lab / Analysis: NMI Sydney

Organised By / Date: # 14/8/26

Relinquished By / Date:

Connote / Courier:

WO No:

Attach By PO / Internal Sheet:

Environmental Division
Sydney
Work Order Reference
ES2141185

Telephone : – 61-2-8784 8555

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1302_MW197_211109		09/11/2021 12:42 PM	Water	ALS: 2 Non ALS: 0	No	X		
002	1302_MW144_211110		09/11/2021 03:49 PM	Water	ALS: 3 Non ALS: 0	No	X		Extra vol for lab qc
003	1302_QC300_211109		09/11/2021 03:49 PM	Water	ALS: 2 Non ALS: 0	No	X		
004	1302_MW303_211109		09/11/2021 04:45 PM	Water	ALS: 2 Non ALS: 0	No	X		
005	1302_MW115_211110		10/11/2021 10:46 AM	Water	ALS: 2 Non ALS: 0	No	X		
006	1302_MW205_211110		10/11/2021 11:08 AM	Water	ALS: 2 Non ALS: 0	No	X		
007	1302_MW112_211110		10/11/2021 11:22 AM	Water	ALS: 2 Non ALS: 0	No	X		
008	1302_MW156_211110		10/11/2021 11:35 AM	Water	ALS: 2 Non ALS: 0	No	X		
009	1302_MW180_211110		10/11/2021 12:37 PM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 29824 ALS Laboratory: ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 15/11/21 9AM	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: 1302_RAAFDarwin

SITE: 1302_RAAFDarwin

ORDER NO:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE: / ES2019AECOMAU0030

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	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	1302_MW209_211110		10/11/2021 02:43 PM	Water	ALS: 2 Non ALS: 0	No	X		
011	1302_QC301_211110		10/11/2021 02:45 PM	Water	ALS: 2 Non ALS: 0	No	X		
012	1302_QC401_211110		10/11/2021 02:46 PM	Water	ALS: 2 Non ALS: 0	No	X		
013	1302_QC101_211110		10/11/2021 04:41 PM	Water	ALS: 2 Non ALS: 0	No	X		
014	1302_QC201_211110		10/11/2021 04:42 PM	Water	ALS: 2 Non ALS: 0	No	X		Please send QC201 to Sydney NMI
015	1302_MW141_211110		10/11/2021 05:08 PM	Water	ALS: 2 Non ALS: 0	No	X		
016	1302_MW139_211110		10/11/2021 05:23 PM	Water	ALS: 2 Non ALS: 0	No	X		
017	1302_MW422_211110		10/11/2021 05:33 PM	Water	ALS: 2 Non ALS: 0	No	X		
018	1302_QC400_211109		09/11/2021 09:45 AM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 29824 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY: ASD	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 15/11/21 9AM	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: 1302_RAAFDarwin

SITE: 1302_RAAFDarwin

ORDER NO:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

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 Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	1302_QC500_211109		09/11/2021 09:46 AM	Water	ALS: 2 Non ALS: 0	No	X		
020	1302_QC302_211111		11/11/2021 09:52 AM	Water	ALS: 2 Non ALS: 0	No	X		
021	1302_QC402_211111		11/11/2021 09:53 AM	Water	ALS: 2 Non ALS: 0	No	X		
022	1302_MW133_211111		11/11/2021 10:14 AM	Water	ALS: 2 Non ALS: 0	No	X		Contamination: H/C odour H
023	1302_MW297_211111		11/11/2021 10:28 AM	Water	ALS: 2 Non ALS: 0	No	X		Contamination: H/C odour, surface sheen
024	1302_MW103_211111		11/11/2021 10:52 AM	Water	ALS: 3 Non ALS: 0	No	X		
025	1302_QC102_211111		11/11/2021 10:53 AM	Water	ALS: 2 Non ALS: 0	No	X		
026	1302_QC202_211111	Please forward to NMI Sydney	11/11/2021 10:54 AM	Water	ALS: 2 Non ALS: 0	No	X		
027	1302_MW107_211111		11/11/2021 11:01 AM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 29824 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY: ASD	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 15/11/21 9AM	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: 1302_RAAFDarwin

SITE: 1302_RAAFDarwin

ORDER NO:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

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 Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	1302_MW215_211111		11/11/2021 11:16 AM	Water	ALS: 2 Non ALS: 0	No	X		
029	1302_MW128_211111		11/11/2021 11:48 AM	Water	ALS: 2 Non ALS: 0	No	X		
030	1302_MW201_211111		11/11/2021 12:38 PM	Water	ALS: 2 Non ALS: 0	No	X		
031	1302_MW211_211111		11/11/2021 12:56 PM	Water	ALS: 2 Non ALS: 0	No	X		
032	1302_MW200_211111		11/11/2021 01:11 PM	Water	ALS: 2 Non ALS: 0	No	X		
033	1302_MW176_211111	Extra volume for lab QC	11/11/2021 01:28 PM	Water	ALS: 3 Non ALS: 0	No	X		
034	1302_QC103_211111		11/11/2021 01:29 PM	Water	ALS: 2 Non ALS: 0	No	X		
035	1302_QC203_211111		11/11/2021 01:30 PM	Water	ALS: 2 Non ALS: 0	No	X		
036	1302_MW210_211111		11/11/2021 02:48 PM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 29824 ALS Laboratory: ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: ASD 15/11/21 9AM	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: 1302_RAAFDarwin

SITE: 1302_RAAFDarwin

ORDER NO:

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:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

SAMPLE DETAILS | **ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
037	1302_MW185_211111		11/11/2021 03:11 PM	Water	ALS: 2 Non ALS: 0	No	X		
038	1302_MW191_211111		11/11/2021 03:21 PM	Water	ALS: 2 Non ALS: 0	No	X		
039	1302_MW190_211111		11/11/2021 03:35 PM	Water	ALS: 2 Non ALS: 0	No	X		
040	1302_MW195_211111	Extra vol for lab qc	11/11/2021 04:00 PM	Water	ALS: 3 Non ALS: 0	No	X		Extra vol for lab qc
041	1302_MW194_211111		11/11/2021 04:18 PM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **29824** *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 15/11/21 9AM	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: 1302_RAAFDarwin

SITE: 1302_RAAFDarwin

ORDER NO:

PROJECT MANAGER [redacted]
PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

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	1302_MW197_211109	HDPE (no PTFE)	20 mL	00352010028150	Grey	No	
001	1302_MW197_211109	HDPE (no PTFE)	20 mL	00352010028335	Grey	No	
002	1302_MW144_211110	HDPE (no PTFE)	20 mL	00352010028258	Grey	No	
002	1302_MW144_211110	HDPE (no PTFE)	20 mL	00352010028378	Grey	No	
002	1302_MW144_211110	HDPE (no PTFE)	20 mL	00350219023446	Grey	No	
003	1302_QC300_211109	HDPE (no PTFE)	20 mL	00352010027981	Grey	No	
003	1302_QC300_211109	HDPE (no PTFE)	20 mL	00352010028214	Grey	No	
004	1302_MW303_211109	HDPE (no PTFE)	20 mL	00352010027932	Grey	No	
004	1302_MW303_211109	HDPE (no PTFE)	20 mL	00352010027999	Grey	No	
005	1302_MW115_211110	HDPE (no PTFE)	20 mL	00352010028247	Grey	No	
005	1302_MW115_211110	HDPE (no PTFE)	20 mL	00352010028162	Grey	No	
006	1302_MW205_211110	HDPE (no PTFE)	20 mL	00352010028361	Grey	No	
006	1302_MW205_211110	HDPE (no PTFE)	20 mL	00352010028027	Grey	No	
007	1302_MW112_211110	HDPE (no PTFE)	20 mL	00352010028330	Grey	No	
007	1302_MW112_211110	HDPE (no PTFE)	20 mL	00352010028075	Grey	No	
008	1302_MW156_211110	HDPE (no PTFE)	20 mL	00352010028396	Grey	No	
008	1302_MW156_211110	HDPE (no PTFE)	20 mL	00352010028250	Grey	No	
009	1302_MW180_211110	HDPE (no PTFE)	20 mL	00352010028032	Grey	No	
009	1302_MW180_211110	HDPE (no PTFE)	20 mL	00352010028446	Grey	No	
010	1302_MW209_211110	HDPE (no PTFE)	20 mL	00352010027881	Grey	No	
010	1302_MW209_211110	HDPE (no PTFE)	20 mL	00352010027911	Grey	No	
011	1302_QC301_211110	HDPE (no PTFE)	20 mL	00352010028382	Grey	No	
011	1302_QC301_211110	HDPE (no PTFE)	20 mL	00352010028428	Grey	No	
012	1302_QC401_211110	HDPE (no PTFE)	20 mL	00352010028386	Grey	No	
012	1302_QC401_211110	HDPE (no PTFE)	20 mL	00352010028084	Grey	No	
013	1302_QC101_211110	HDPE (no PTFE)	20 mL	00352010028353	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 29824 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 15/11/21 9AM	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: 1302_RAAFDarwin

SITE: 1302_RAAFDarwin

ORDER NO:

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:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

013	1302_QC101_211110	HDPE (no PTFE)	20 mL	00352010027863	Grey	No	
014	1302_QC201_211110	HDPE (no PTFE)	20 mL	00352010028424	Grey	No	
014	1302_QC201_211110	HDPE (no PTFE)	20 mL	00352010028260	Grey	No	
015	1302_MW141_211110	HDPE (no PTFE)	20 mL	00352010028341	Grey	No	
015	1302_MW141_211110	HDPE (no PTFE)	20 mL	00352010028329	Grey	No	
016	1302_MW139_211110	HDPE (no PTFE)	20 mL	00352010028067	Grey	No	
016	1302_MW139_211110	HDPE (no PTFE)	20 mL	00352010028406	Grey	No	
017	1302_MW422_211110	HDPE (no PTFE)	20 mL	00352010028417	Grey	No	
017	1302_MW422_211110	HDPE (no PTFE)	20 mL	00352010028365	Grey	No	
018	1302_QC400_211109	HDPE (no PTFE)	20 mL	00352010028312	Grey	No	
018	1302_QC400_211109	HDPE (no PTFE)	20 mL	00352010028321	Grey	No	
019	1302_QC500_211109	HDPE (no PTFE)	20 mL	00350019180779	Grey	No	
019	1302_QC500_211109	HDPE (no PTFE)	20 mL	00350019180781	Grey	No	
020	1302_QC302_211111	HDPE (no PTFE)	20 mL	00352010028148	Grey	No	
020	1302_QC302_211111	HDPE (no PTFE)	20 mL	00352010028164	Grey	No	
021	1302_QC402_211111	HDPE (no PTFE)	20 mL	00352010028156	Grey	No	
021	1302_QC402_211111	HDPE (no PTFE)	20 mL	00352010028159	Grey	No	
022	1302_MW133_211111	HDPE (no PTFE)	20 mL	00352010028328	Grey	No	
022	1302_MW133_211111	HDPE (no PTFE)	20 mL	00352010028449	Grey	No	
023	1302_MW297_211111	HDPE (no PTFE)	20 mL	00352010028207	Grey	No	
023	1302_MW297_211111	HDPE (no PTFE)	20 mL	00352010028411	Grey	No	
024	1302_MW103_211111	HDPE (no PTFE)	20 mL	00350719054419	Grey	No	
024	1302_MW103_211111	HDPE (no PTFE)	20 mL	00352010028344	Grey	No	
024	1302_MW103_211111	HDPE (no PTFE)	20 mL	00352010028363	Grey	No	
025	1302_QC102_211111	HDPE (no PTFE)	20 mL	00352010028231	Grey	No	
025	1302_QC102_211111	HDPE (no PTFE)	20 mL	00352010027989	Grey	No	
026	1302_QC202_211111	HDPE (no PTFE)	20 mL	00352010028203	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 29824 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: 1302_RAAFDarwin

SITE: 1302_RAAFDarwin

ORDER NO:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 15/11/21 9AM	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	1302_QC202_211111	HDPE (no PTFE)	20 mL	00352010027934	Grey	No	
027	1302_MW107_211111	HDPE (no PTFE)	20 mL	00352010028425	Grey	No	
027	1302_MW107_211111	HDPE (no PTFE)	20 mL	00352010028263	Grey	No	
028	1302_MW215_211111	HDPE (no PTFE)	20 mL	00352010028042	Grey	No	
028	1302_MW215_211111	HDPE (no PTFE)	20 mL	00352010028107	Grey	No	
029	1302_MW128_211111	HDPE (no PTFE)	20 mL	00352010027956	Grey	No	
029	1302_MW128_211111	HDPE (no PTFE)	20 mL	00352010028336	Grey	No	
030	1302_MW201_211111	HDPE (no PTFE)	20 mL	00352010027853	Grey	No	
030	1302_MW201_211111	HDPE (no PTFE)	20 mL	00352010028262	Grey	No	
031	1302_MW211_211111	HDPE (no PTFE)	20 mL	00352010028403	Grey	No	
031	1302_MW211_211111	HDPE (no PTFE)	20 mL	00352010028398	Grey	No	
032	1302_MW200_211111	HDPE (no PTFE)	20 mL	00352010028287	Grey	No	
032	1302_MW200_211111	HDPE (no PTFE)	20 mL	00352010028031	Grey	No	
033	1302_MW176_211111	HDPE (no PTFE)	20 mL	00352010028025	Grey	No	
033	1302_MW176_211111	HDPE (no PTFE)	20 mL	00352010028400	Grey	No	
033	1302_MW176_211111	HDPE (no PTFE)	20 mL	00350719054451	Grey	No	
034	1302_QC103_211111	HDPE (no PTFE)	20 mL	00352010027965	Grey	No	
034	1302_QC103_211111	HDPE (no PTFE)	20 mL	00352010028337	Grey	No	
035	1302_QC203_211111	HDPE (no PTFE)	20 mL	00352010028298	Grey	No	
035	1302_QC203_211111	HDPE (no PTFE)	20 mL	00352010027993	Grey	No	
036	1302_MW210_211111	HDPE (no PTFE)	20 mL	00352010028397	Grey	No	
036	1302_MW210_211111	HDPE (no PTFE)	20 mL	00352010028146	Grey	No	
037	1302_MW185_211111	HDPE (no PTFE)	20 mL	00352010027959	Grey	No	
037	1302_MW185_211111	HDPE (no PTFE)	20 mL	00352010027984	Grey	No	
038	1302_MW191_211111	HDPE (no PTFE)	20 mL	00352010028064	Grey	No	
038	1302_MW191_211111	HDPE (no PTFE)	20 mL	00352010027979	Grey	No	
039	1302_MW190_211111	HDPE (no PTFE)	20 mL	00352010027957	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 29824 ALS Laboratory: ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 15/11/21 9AM	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: 1302_RAAFDarwin

SITE: 1302_RAAFDarwin

ORDER NO:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

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:			

039	1302_MW190_211111	HDPE (no PTFE)	20 mL	00352010028234	Grey	No	
040	1302_MW195_211111	HDPE (no PTFE)	20 mL	00350719054385	Grey	No	
040	1302_MW195_211111	HDPE (no PTFE)	20 mL	00352010028155	Grey	No	
040	1302_MW195_211111	HDPE (no PTFE)	20 mL	00352010028242	Grey	No	
041	1302_MW194_211111	HDPE (no PTFE)	20 mL	00352010027995	Grey	No	
041	1302_MW194_211111	HDPE (no PTFE)	20 mL	00352010028418	Grey	No	

Total Bottle Count: ALS: 86, Non ALS: 0

ALSCompass
SAMPLING *Intelligence*

ALS Use Only

Custody Document for Submissions via ALS Compass App

Project: 60612561 **Client:** AECOM **Project Manager:** [redacted]
Phone: ( )

ALS Compass COC Reference: 29824 **# Samples:** 41 **Sampler:** [redacted]
Phone:

Turnaround Requirements: Standard X Urgent

Special Instructions:	ALS Use Only			
	Custody seal intact?	YES	NO	N/A
	Free ice / frozen ice bricks upon receipt?	YES	NO	N/A
	Random sample temperature on receipt?	17.2	°C	

Custody:

Relinquished by:	**Received by:**	**Relinquished by:**	**Received by:**
[redacted]			ASD
Date / Time:	**Date / Time:**	**Date / Time:**	**Date / Time:**
11.11.21 15:15	11/11/21 15:15		15/11/21 9AM

Appendix F

Laboratory Certificates

Appendix F Laboratory Certificates

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2141185**

Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: GPO BOX 3175 DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: +[redacted]
Project	: 1302_RAAFDarwin	Page	: 1 of 4
Order number	: 1302_RAAFDARWIN	Quote number	: ES2019AECOMAU0030 (SY/139/19 V3)
C-O-C number	: 29824	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: 1302_RAAFDarwin		
Sampler	: [redacted]		

Dates

Date Samples Received	: 15-Nov-2021 09:00	Issue Date	: 15-Nov-2021
Client Requested Due Date	: 22-Nov-2021	Scheduled Reporting Date	: **22-Nov-2021**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 17.2' C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 39 / 39

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
- **Samples #14 and 26 to be forwarded to NMI - Sydney for analysis.**
- **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 direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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.

ES2141185-033 : 11-Nov-2021 13:28 : 1302_MW176_211111 - Extra volume for lab QC
ES2141185-040 : 11-Nov-2021 16:00 : 1302_MW195_211111 - Extra vol for lab qc

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)
ES2141185-001	09-Nov-2021 12:42	1302_MW197_211109	✓
ES2141185-002	09-Nov-2021 15:49	1302_MW144_211110	✓
ES2141185-003	09-Nov-2021 15:49	1302_QC300_211109	✓
ES2141185-004	09-Nov-2021 16:45	1302_MW303_211109	✓
ES2141185-005	10-Nov-2021 10:46	1302_MW115_211110	✓
ES2141185-006	10-Nov-2021 11:08	1302_MW205_211110	✓
ES2141185-007	10-Nov-2021 11:22	1302_MW112_211110	✓
ES2141185-008	10-Nov-2021 11:35	1302_MW156_211110	✓
ES2141185-009	10-Nov-2021 12:37	1302_MW180_211110	✓
ES2141185-010	10-Nov-2021 14:44	1302_MW209_211110	✓
ES2141185-011	10-Nov-2021 14:45	1302_QC301_211110	✓
ES2141185-012	10-Nov-2021 14:46	1302_QC401_211110	✓
ES2141185-013	10-Nov-2021 14:41	1302_QC101_211110	✓
ES2141185-015	10-Nov-2021 17:08	1302_MW141_211110	✓
ES2141185-016	10-Nov-2021 16:53	1302_MW139_211110	✓
ES2141185-017	10-Nov-2021 17:33	1302_MW422_211110	✓
ES2141185-018	09-Nov-2021 09:45	1302_QC400_211109	✓
ES2141185-019	09-Nov-2021 09:46	1302_QC500_211109	✓
ES2141185-020	11-Nov-2021 09:52	1302_QC302_211111	✓
ES2141185-021	11-Nov-2021 09:53	1302_QC402_211111	✓
ES2141185-022	11-Nov-2021 10:14	1302_MW133_211111	✓
ES2141185-023	11-Nov-2021 10:28	1302_MW297_211111	✓
ES2141185-024	11-Nov-2021 10:52	1302_MW103_211111	✓
ES2141185-025	11-Nov-2021 09:46	1302_QC102_211111	✓
ES2141185-027	11-Nov-2021 11:16	1302_MW107_211111	✓
ES2141185-028	11-Nov-2021 09:46	1302_MW215_211111	✓
ES2141185-029	11-Nov-2021 11:48	1302_MW128_211111	✓
ES2141185-030	11-Nov-2021 12:38	1302_MW201_211111	✓
ES2141185-031	11-Nov-2021 12:56	1302_MW211_211111	✓
ES2141185-032	11-Nov-2021 13:11	1302_MW200_211111	✓
ES2141185-033	11-Nov-2021 13:28	1302_MW176_211111 E...	✓
ES2141185-034	11-Nov-2021 13:29	1302_QC103_211111	✓

			WATER - EP231X PFAS - Full Suite (28 analytes)
ES2141185-035	11-Nov-2021 13:30	1302_QC203_211111	✓
ES2141185-036	11-Nov-2021 14:48	1302_MW210_211111	✓
ES2141185-037	11-Nov-2021 15:11	1302_MW185_211111	✓
ES2141185-038	11-Nov-2021 15:31	1302_MW191_211111	✓
ES2141185-039	11-Nov-2021 15:35	1302_MW190_211111	✓
ES2141185-040	11-Nov-2021 16:00	1302_MW195_211111 E...	✓
ES2141185-041	11-Nov-2021 16:18	1302_MW194_211111	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2141185**	Page	: 1 of 19
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: GPO BOX 3175 DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: [redacted]
Project	: 1302_RAAFDarwin	Date Samples Received	: 15-Nov-2021 09:00
Order number	: 1302_RAAFDARWIN	Date Analysis Commenced	: 16-Nov-2021
C-O-C number	: 29824	Issue Date	: 22-Nov-2021 07:41
Sampler	: [redacted]		
Site	: 1302_RAAFDarwin		
Quote number	: SY/139/19 V3		
No. of samples received	: 39		
No. of samples analysed	: 39		

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*
[redacted]	[redacted]	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 Contact 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.
- EP231X: PFAS results for sample #34, #35 confirmed by re-extraction and re-analysis.
- 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: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW197_211109	1302_MW144_211110	1302_QC300_211109	1302_MW303_211109	1302_MW115_211110
				Sampling date / time	09-Nov-2021 12:42	09-Nov-2021 15:49	09-Nov-2021 15:49	09-Nov-2021 16:45	10-Nov-2021 10:46
					ES2141185-001	ES2141185-002	ES2141185-003	ES2141185-004	ES2141185-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.21**	**0.21**	<0.02	**6.58**	**3.32**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.28**	**0.21**	<0.02	**7.08**	**2.75**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**2.93**	**1.73**	<0.01	**41.3**	**26.4**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.29**	**0.12**	<0.02	**2.04**	**3.76**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**6.68**	**3.98**	<0.01	**54.3**	**62.2**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	**0.02**	**0.23**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	**1.1**	**0.5**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.08**	**0.06**	<0.02	**1.98**	**1.04**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.56**	**0.39**	<0.02	**14.5**	**7.61**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.06**	**0.04**	<0.02	**1.55**	**0.67**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.16**	**0.09**	<0.01	**3.34**	**1.82**
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	**0.05**	**0.34**
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: WATER (Matrix: WATER)				Sample ID	1302_MW197_211109	1302_MW144_211110	1302_QC300_211109	1302_MW303_211109	1302_MW115_211110
				Sampling date / time	09-Nov-2021 12:42	09-Nov-2021 15:49	09-Nov-2021 15:49	09-Nov-2021 16:45	10-Nov-2021 10:46
Compound	CAS Number	LOR	Unit		ES2141185-001	ES2141185-002	ES2141185-003	ES2141185-004	ES2141185-005
					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	**0.11**	<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		**11.2**	**6.83**	<0.01	**134**	**111**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**9.61**	**5.71**	<0.01	**95.6**	**88.6**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**10.7**	**6.50**	<0.01	**125**	**104**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.1**	**106**	**99.2**	**106**	**68.3**
13C8-PFOA	----	0.02	%		**102**	**97.5**	**102**	**99.4**	**99.8**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW205_211110	1302_MW112_211110	1302_MW156_211110	1302_MW180_211110	1302_MW209_211110
				Sampling date / time	10-Nov-2021 11:08	10-Nov-2021 11:22	10-Nov-2021 11:35	10-Nov-2021 12:37	10-Nov-2021 14:44
					ES2141185-006	ES2141185-007	ES2141185-008	ES2141185-009	ES2141185-010
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.26**	**0.43**	**0.15**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.31**	**0.55**	**0.17**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**2.24**	**3.64**	**1.44**	**0.07**	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.15**	**0.42**	**0.09**	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**4.64**	**18.2**	**3.35**	**0.01**	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	**0.06**	<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		**0.06**	**0.16**	**0.04**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.42**	**1.23**	**0.32**	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.05**	**0.13**	**0.03**	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.12**	**0.32**	**0.07**	<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	**0.05**	<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: WATER (Matrix: WATER)				Sample ID	1302_MW205_211110	1302_MW112_211110	1302_MW156_211110	1302_MW180_211110	1302_MW209_211110
				Sampling date / time	10-Nov-2021 11:08	10-Nov-2021 11:22	10-Nov-2021 11:35	10-Nov-2021 12:37	10-Nov-2021 14:44
Compound	CAS Number	LOR	Unit		ES2141185-006	ES2141185-007	ES2141185-008	ES2141185-009	ES2141185-010
					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	**0.06**	<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		**8.25**	**25.2**	**5.66**	**0.08**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**6.88**	**21.8**	**4.79**	**0.08**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**7.79**	**24.2**	**5.40**	**0.08**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**91.5**	**107**	**96.1**	**102**
13C8-PFOA	----	0.02	%		**100**	**101**	**101**	**98.7**	**106**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC301_211110	1302_QC401_211110	1302_QC101_211110	1302_MW141_211110	1302_MW139_211110
				Sampling date / time	10-Nov-2021 14:45	10-Nov-2021 14:46	10-Nov-2021 14:41	10-Nov-2021 17:08	10-Nov-2021 16:53
Compound	CAS Number	LOR	Unit		ES2141185-011	ES2141185-012	ES2141185-013	ES2141185-015	ES2141185-016
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	**0.22**	<0.02	**0.07**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	**0.25**	<0.02	**0.07**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	**1.82**	**0.16**	**0.56**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	**0.12**	<0.02	**0.04**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	**3.42**	**0.16**	**1.70**
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	**0.05**	<0.02	**0.02**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**0.39**	<0.02	**0.14**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.04**	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.10**	<0.01	**0.03**
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: WATER (Matrix: WATER)				Sample ID	1302_QC301_211110	1302_QC401_211110	1302_QC101_211110	1302_MW141_211110	1302_MW139_211110
				Sampling date / time	10-Nov-2021 14:45	10-Nov-2021 14:46	10-Nov-2021 14:41	10-Nov-2021 17:08	10-Nov-2021 16:53
Compound	CAS Number	LOR	Unit		ES2141185-011	ES2141185-012	ES2141185-013	ES2141185-015	ES2141185-016
					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	**6.41**	**0.32**	**2.63**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**5.24**	**0.32**	**2.26**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**6.04**	**0.32**	**2.52**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.1**	**96.9**	**93.5**	**97.5**	**110**
13C8-PFOA	----	0.02	%		**94.9**	**96.8**	**101**	**100**	**100**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW422_211110	1302_QC400_211109	1302_QC500_211109	1302_QC302_211111	1302_QC402_211111
				Sampling date / time	10-Nov-2021 17:33	09-Nov-2021 09:45	09-Nov-2021 09:46	11-Nov-2021 09:52	11-Nov-2021 09:53
Compound	CAS Number	LOR	Unit		ES2141185-017	ES2141185-018	ES2141185-019	ES2141185-020	ES2141185-021
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**4.44**	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**3.22**	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**27.4**	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**3.43**	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**45.6**	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		**0.11**	<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	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**1.80**	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**11.0**	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.88**	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**1.56**	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.04**	<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		**0.05**	<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: WATER (Matrix: WATER)				Sample ID	1302_MW422_211110	1302_QC400_211109	1302_QC500_211109	1302_QC302_211111	1302_QC402_211111
				Sampling date / time	10-Nov-2021 17:33	09-Nov-2021 09:45	09-Nov-2021 09:46	11-Nov-2021 09:52	11-Nov-2021 09:53
Compound	CAS Number	LOR	Unit		ES2141185-017	ES2141185-018	ES2141185-019	ES2141185-020	ES2141185-021
					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		**100**	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**73.0**	<0.01	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**93.7**	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**90.1**	**99.5**	**103**	**105**	**104**
13C8-PFOA	----	0.02	%		**94.5**	**94.5**	**96.5**	**95.0**	**101**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW133_211111	1302_MW297_211111	1302_MW103_211111	1302_QC102_211111	1302_MW107_211111
				Sampling date / time	11-Nov-2021 10:14	11-Nov-2021 10:28	11-Nov-2021 10:52	11-Nov-2021 09:46	11-Nov-2021 11:16
					ES2141185-022	ES2141185-023	ES2141185-024	ES2141185-025	ES2141185-027
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.62**	**1.18**	**0.69**	**0.67**	**0.46**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.64**	**0.90**	**0.96**	**0.94**	**0.51**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**7.16**	**9.76**	**10.6**	**10.8**	**4.70**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.74**	**1.18**	**0.65**	**0.63**	**0.30**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**28.5**	**28.3**	**33.2**	**31.0**	**8.51**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		**0.03**	**0.06**	<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		**0.39**	**0.52**	**0.31**	**0.31**	**0.19**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**3.02**	**3.71**	**2.42**	**2.33**	**1.07**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.22**	**0.45**	**0.26**	**0.25**	**0.13**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.54**	**1.04**	**0.69**	**0.68**	**0.27**
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		**0.04**	**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: WATER (Matrix: WATER)				Sample ID	1302_MW133_211111	1302_MW297_211111	1302_MW103_211111	1302_QC102_211111	1302_MW107_211111
				Sampling date / time	11-Nov-2021 10:14	11-Nov-2021 10:28	11-Nov-2021 10:52	11-Nov-2021 09:46	11-Nov-2021 11:16
Compound	CAS Number	LOR	Unit		ES2141185-022	ES2141185-023	ES2141185-024	ES2141185-025	ES2141185-027
					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		**0.15**	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		**0.06**	<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		**42.2**	**47.1**	**49.9**	**47.7**	**16.1**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**35.7**	**38.1**	**43.8**	**41.8**	**13.2**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**40.8**	**45.0**	**48.3**	**46.1**	**15.3**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**102**	**95.2**	**91.0**	**108**
13C8-PFOA	----	0.02	%		**99.3**	**96.1**	**101**	**101**	**97.5**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW215_211111	1302_MW128_211111	1302_MW201_211111	1302_MW211_211111	1302_MW200_211111
				Sampling date / time	11-Nov-2021 09:46	11-Nov-2021 11:48	11-Nov-2021 12:38	11-Nov-2021 12:56	11-Nov-2021 13:11
Compound	CAS Number	LOR	Unit		ES2141185-028	ES2141185-029	ES2141185-030	ES2141185-031	ES2141185-032
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.19**	**0.21**	<0.02	<0.02	**0.09**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.17**	**0.21**	<0.02	<0.02	**0.08**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.81**	**2.15**	**0.01**	**0.14**	**0.74**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.14**	**0.13**	<0.02	<0.02	**0.04**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**5.45**	**5.35**	**0.07**	**0.22**	**1.04**
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		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.11**	**0.11**	<0.02	<0.02	**0.02**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.39**	**0.53**	<0.02	<0.02	**0.13**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.06**	**0.07**	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.11**	**0.12**	<0.01	<0.01	**0.03**
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: WATER (Matrix: WATER)				Sample ID	1302_MW215_211111	1302_MW128_211111	1302_MW201_211111	1302_MW211_211111	1302_MW200_211111
				Sampling date / time	11-Nov-2021 09:46	11-Nov-2021 11:48	11-Nov-2021 12:38	11-Nov-2021 12:56	11-Nov-2021 13:11
Compound	CAS Number	LOR	Unit		ES2141185-028	ES2141185-029	ES2141185-030	ES2141185-031	ES2141185-032
					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		**8.43**	**8.88**	**0.08**	**0.36**	**2.17**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**7.26**	**7.50**	**0.08**	**0.36**	**1.78**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**8.12**	**8.54**	**0.08**	**0.36**	**2.05**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**102**	**105**	**101**	**100**
13C8-PFOA	----	0.02	%		**99.3**	**100**	**99.1**	**97.9**	**101**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW176_211111 Extra volume for lab QC	1302_QC103_211111	1302_QC203_211111	1302_MW210_211111	1302_MW185_211111
				Sampling date / time	11-Nov-2021 13:28	11-Nov-2021 13:29	11-Nov-2021 13:30	11-Nov-2021 14:48	11-Nov-2021 15:11
					ES2141185-033	ES2141185-034	ES2141185-035	ES2141185-036	ES2141185-037
					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	**0.04**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	**0.03**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.04**	**0.04**	**0.04**	**0.39**	**0.10**
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		**0.09**	**0.07**	**0.07**	**1.10**	**0.10**
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	**0.08**	**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	**0.02**	**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

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW176_211111 Extra volume for lab QC	1302_QC103_211111	1302_QC203_211111	1302_MW210_211111	1302_MW185_211111
				Sampling date / time	11-Nov-2021 13:28	11-Nov-2021 13:29	11-Nov-2021 13:30	11-Nov-2021 14:48	11-Nov-2021 15:11
					ES2141185-033	ES2141185-034	ES2141185-035	ES2141185-036	ES2141185-037
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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
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		**0.13**	**0.11**	**0.11**	**1.68**	**0.23**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.13**	**0.11**	**0.11**	**1.49**	**0.20**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.13**	**0.11**	**0.11**	**1.65**	**0.23**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**104**	**104**	**107**	**100**
13C8-PFOA	----	0.02	%		**97.5**	**98.6**	**98.4**	**100**	**98.8**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW191_211111	1302_MW190_211111	1302_MW195_211111 Extra vol for lab qc	1302_MW194_211111	----
				Sampling date / time	11-Nov-2021 15:31	11-Nov-2021 15:35	11-Nov-2021 16:00	11-Nov-2021 16:18	----
Compound	CAS Number	LOR	Unit		ES2141185-038	ES2141185-039	ES2141185-040	ES2141185-041	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.06**	**0.14**	**0.09**	**0.18**	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.05**	**0.14**	**0.08**	**0.14**	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.64**	**1.36**	**0.73**	**1.14**	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.02**	**0.08**	**0.04**	**0.08**	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.37**	**2.54**	**1.04**	**3.51**	----
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		**0.04**	**0.09**	<0.02	**0.07**	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.17**	**0.46**	**0.07**	**0.33**	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.05**	<0.02	**0.04**	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.04**	**0.08**	**0.02**	**0.08**	----
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	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW191_211111	1302_MW190_211111	1302_MW195_211111 Extra vol for lab qc	1302_MW194_211111	----
				Sampling date / time	11-Nov-2021 15:31	11-Nov-2021 15:35	11-Nov-2021 16:00	11-Nov-2021 16:18	----
Compound	CAS Number	LOR	Unit		ES2141185-038	ES2141185-039	ES2141185-040	ES2141185-041	--------
					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	----
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	----
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		**2.39**	**4.94**	**2.07**	**5.57**	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**2.01**	**3.90**	**1.77**	**4.65**	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**2.32**	**4.72**	**1.95**	**5.35**	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	**103**	**104**	**110**	----
13C8-PFOA	----	0.02	%		**96.8**	**99.3**	**99.6**	**99.1**	----

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2141185**	Page	: 1 of 11
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: GPO BOX 3175 DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: [redacted]
Project	: 1302_RAAFDarwin	Date Samples Received	: 15-Nov-2021
Order number	: 1302_RAAFDARWIN	Date Analysis Commenced	: 16-Nov-2021
C-O-C number	: 29824	Issue Date	: 22-Nov-2021
Sampler	: [redacted]		
Site	: 1302_RAAFDarwin		
Quote number	: SY/139/19 V3		
No. of samples received	: 39		
No. of samples analysed	: 39		

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*
[redacted]	[redacted]r	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 (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4015491)									
ES2141185-002	1302_MW144_211110	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.73	1.75	0.9	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	3.98	4.06	2.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.21	0.21	0.0	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.21	0.22	4.6	0% - 50%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.12	0.12	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: 4017914)									
ES2141185-024	1302_MW103_211111	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	10.6	11.2	5.5	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	33.2	33.5	0.7	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.69	0.71	2.4	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.96	0.97	0.0	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.65	0.66	1.5	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ES2141185-033	1302_MW176_211111 Extra volume for lab QC	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.09	0.09	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: 4015491)									
ES2141185-002	1302_MW144_211110	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.09	0.09	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.39	0.39	0.0	0% - 50%

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: 4015491) - continued									
ES2141185-002	1302_MW144_211110	EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.04	0.04	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: 4017914)									
ES2141185-024	1302_MW103_211111	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.69	0.71	1.7	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.31	0.32	0.0	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	2.42	2.44	0.8	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.26	0.26	0.0	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	0.1	0.1	0.0	No Limit
ES2141185-033	1302_MW176_211111 Extra volume for lab QC	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: 4015491)									
ES2141185-002	1302_MW144_211110	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

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: 4015491) - continued									
ES2141185-002	1302_MW144_211110	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: 4017914)									
ES2141185-024	1302_MW103_211111	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
ES2141185-033	1302_MW176_211111 Extra volume for lab QC	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: 4015491)									
ES2141185-002	1302_MW144_211110	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: 4015491) - continued									
ES2141185-002	1302_MW144_211110	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: 4017914)									
ES2141185-024	1302_MW103_211111	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
ES2141185-033	1302_MW176_211111 Extra volume for lab QC	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: 4015491)									
ES2141185-002	1302_MW144_211110	EP231X: Sum of PFAS	----	0.01	µg/L	6.83	6.94	1.6	0% - 20%
EP231P: PFAS Sums (QC Lot: 4017914)									
ES2141185-024	1302_MW103_211111	EP231X: Sum of PFAS	----	0.01	µg/L	49.9	50.9	2.0	0% - 20%
ES2141185-033	1302_MW176_211111 Extra volume for lab QC	EP231X: Sum of PFAS	----	0.01	µg/L	0.13	0.13	0.0	0% - 50%

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4015491)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	80.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	86.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	82.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	78.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	76.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	71.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4017914)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	90.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	80.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	80.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	82.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	87.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	79.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4018578)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	89.6	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	85.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	88.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	81.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4015491)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	77.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	78.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	91.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	82.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	86.0	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	82.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	77.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	74.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	86.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	80.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	84.6	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4017914)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	79.7	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: 4017914) - continued								
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	89.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	98.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	88.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	88.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	83.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	80.8	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	84.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4018578)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	89.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	95.0	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	97.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	116	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	90.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4015491)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	77.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	74.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	75.8	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	80.3	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	81.5	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	78.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	76.2	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4017914)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	83.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	83.4	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	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4017914) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	89.2	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	89.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	91.2	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4018578)								
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	74.1	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	84.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.4	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	76.5	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	96.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	91.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4015491)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	76.8	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	83.4	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	83.8	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	83.2	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4017914)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	89.6	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	83.2	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	88.6	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	83.6	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4018578)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	89.8	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	107	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	97.6	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**

				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: 4015491)							
ES2141185-002	1302_MW144_211110	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	112	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	120	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	106	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	115	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4017914)							
ES2141185-024	1302_MW103_211111	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	125	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	94.0	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	113	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	121	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4015491)							
ES2141185-002	1302_MW144_211110	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	88.1	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	95.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	125	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	108	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	129	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	105	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	101	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	99.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	95.4	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	87.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	121	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4017914)							
ES2141185-024	1302_MW103_211111	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	104	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	120	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	115	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	133	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	113	69.0	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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4017914) - continued							
ES2141185-024	1302_MW103_211111	EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	113	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	110	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	105	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	83.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	109	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4015491)							
ES2141185-002	1302_MW144_211110	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	104	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	79.4	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	99.2	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	100	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	98.1	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	105	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	114	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4017914)							
ES2141185-024	1302_MW103_211111	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	94.4	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	83.1	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	104	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	100	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	82.3	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	106	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	111	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4015491)							
ES2141185-002	1302_MW144_211110	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	110	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	124	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	114	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4017914)							
ES2141185-024	1302_MW103_211111	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	109	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: 4017914) - continued							
ES2141185-024	1302_MW103_211111	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	106	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	95.4	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2141185**	Page	: 1 of 9
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Telephone	[redacted]
Project	: 1302_RAAFDarwin	Date Samples Received	: 15-Nov-2021
Site	: 1302_RAAFDarwin	Issue Date	: 22-Nov-2021
Sampler	[redacted]	No. of samples received	: 39
Order number	: 1302_RAAFDARWIN	No. of samples analysed	: 39

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							
EP231A: Perfluoroalkyl Sulfonic Acids	ES2141185--002	1302_MW144_211110	**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	ES2141185--024	1302_MW103_211111	**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	ES2141185--002	1302_MW144_211110	**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	ES2141185--024	1302_MW103_211111	**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	ES2141185--024	1302_MW103_211111	**Perfluorohexanoic acid (PFHxA)**	307-24-4	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	3	56	5.36	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	56	3.57	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***	*Due for extraction*	*Evaluation*	*Analysis* ***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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_MW197_211109, 1302_MW144_211110, 1302_QC300_211109, 1302_MW303_211109, 1302_QC400_211109, 1302_QC500_211109	**09-Nov-2021**	**17-Nov-2021**	08-May-2022	✓	**17-Nov-2021**	08-May-2022	✓
HDPE (no PTFE) (EP231X)							
1302_MW115_211110, 1302_MW205_211110, 1302_MW112_211110, 1302_MW156_211110, 1302_MW180_211110, 1302_MW209_211110, 1302_QC301_211110, 1302_QC401_211110, 1302_QC101_211110, 1302_MW141_211110, 1302_MW139_211110, 1302_MW422_211110	**10-Nov-2021**	**17-Nov-2021**	09-May-2022	✓	**17-Nov-2021**	09-May-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC302_211111	**11-Nov-2021**	**17-Nov-2021**	10-May-2022	✓	**17-Nov-2021**	10-May-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC402_211111, 1302_MW133_211111, 1302_MW297_211111, 1302_MW103_211111, 1302_QC102_211111, 1302_MW107_211111, 1302_MW215_211111, 1302_MW128_211111, 1302_MW201_211111, 1302_MW211_211111, 1302_MW200_211111, 1302_QC103_211111, 1302_QC203_211111, 1302_MW176_211111 - Extra volume for lab QC, 1302_MW210_211111, 1302_MW185_211111, 1302_MW191_211111, 1302_MW190_211111, 1302_MW195_211111 - Extra vol for lab qc, 1302_MW194_211111	**11-Nov-2021**	**18-Nov-2021**	10-May-2022	✓	**18-Nov-2021**	10-May-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
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_MW197_211109, 1302_MW144_211110, 1302_QC300_211109, 1302_MW303_211109, 1302_QC400_211109, 1302_QC500_211109	**09-Nov-2021**	**17-Nov-2021**	08-May-2022	✓	**17-Nov-2021**	08-May-2022	✓
HDPE (no PTFE) (EP231X)							
1302_MW115_211110, 1302_MW205_211110, 1302_MW112_211110, 1302_MW156_211110, 1302_MW180_211110, 1302_MW209_211110, 1302_QC301_211110, 1302_QC401_211110, 1302_QC101_211110, 1302_MW141_211110, 1302_MW139_211110, 1302_MW422_211110	**10-Nov-2021**	**17-Nov-2021**	09-May-2022	✓	**17-Nov-2021**	09-May-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC302_211111	**11-Nov-2021**	**17-Nov-2021**	10-May-2022	✓	**17-Nov-2021**	10-May-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC402_211111, 1302_MW133_211111, 1302_MW297_211111, 1302_MW103_211111, 1302_QC102_211111, 1302_MW107_211111, 1302_MW215_211111, 1302_MW128_211111, 1302_MW201_211111, 1302_MW211_211111, 1302_MW200_211111, 1302_QC103_211111, 1302_QC203_211111, 1302_MW176_211111 - Extra volume for lab QC, 1302_MW210_211111, 1302_MW185_211111, 1302_MW191_211111, 1302_MW190_211111, 1302_MW195_211111 - Extra vol for lab qc, 1302_MW194_211111	**11-Nov-2021**	**18-Nov-2021**	10-May-2022	✓	**18-Nov-2021**	10-May-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
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 1302_MW197_211109, 1302_MW144_211110, 1302_QC300_211109, 1302_MW303_211109, 1302_QC400_211109, 1302_QC500_211109	**09-Nov-2021**	**17-Nov-2021**	08-May-2022	✓	**17-Nov-2021**	08-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_MW115_211110, 1302_MW205_211110, 1302_MW112_211110, 1302_MW156_211110, 1302_MW180_211110, 1302_MW209_211110, 1302_QC301_211110, 1302_QC401_211110, 1302_QC101_211110, 1302_MW141_211110, 1302_MW139_211110, 1302_MW422_211110	**10-Nov-2021**	**17-Nov-2021**	09-May-2022	✓	**17-Nov-2021**	09-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_QC302_211111	**11-Nov-2021**	**17-Nov-2021**	10-May-2022	✓	**17-Nov-2021**	10-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_QC402_211111, 1302_MW133_211111, 1302_MW297_211111, 1302_MW103_211111, 1302_QC102_211111, 1302_MW107_211111, 1302_MW215_211111, 1302_MW128_211111, 1302_MW201_211111, 1302_MW211_211111, 1302_MW200_211111, 1302_QC103_211111, 1302_QC203_211111, 1302_MW176_211111 - Extra volume for lab QC, 1302_MW210_211111, 1302_MW185_211111, 1302_MW191_211111, 1302_MW190_211111, 1302_MW195_211111 - Extra vol for lab qc, 1302_MW194_211111	**11-Nov-2021**	**18-Nov-2021**	10-May-2022	✓	**18-Nov-2021**	10-May-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
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_MW197_211109, 1302_MW144_211110, 1302_QC300_211109, 1302_MW303_211109, 1302_QC400_211109, 1302_QC500_211109	**09-Nov-2021**	**17-Nov-2021**	08-May-2022	✓	**17-Nov-2021**	08-May-2022	✓
HDPE (no PTFE) (EP231X)							
1302_MW115_211110, 1302_MW205_211110, 1302_MW112_211110, 1302_MW156_211110, 1302_MW180_211110, 1302_MW209_211110, 1302_QC301_211110, 1302_QC401_211110, 1302_QC101_211110, 1302_MW141_211110, 1302_MW139_211110, 1302_MW422_211110	**10-Nov-2021**	**17-Nov-2021**	09-May-2022	✓	**17-Nov-2021**	09-May-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC302_211111	**11-Nov-2021**	**17-Nov-2021**	10-May-2022	✓	**17-Nov-2021**	10-May-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC402_211111, 1302_MW133_211111, 1302_MW297_211111, 1302_MW103_211111, 1302_QC102_211111, 1302_MW107_211111, 1302_MW215_211111, 1302_MW128_211111, 1302_MW201_211111, 1302_MW211_211111, 1302_MW200_211111, 1302_QC103_211111, 1302_QC203_211111, 1302_MW176_211111 - Extra volume for lab QC, 1302_MW210_211111, 1302_MW185_211111, 1302_MW191_211111, 1302_MW190_211111, 1302_MW195_211111 - Extra vol for lab qc, 1302_MW194_211111	**11-Nov-2021**	**18-Nov-2021**	10-May-2022	✓	**18-Nov-2021**	10-May-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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_MW197_211109, 1302_MW144_211110, 1302_QC300_211109, 1302_MW303_211109, 1302_QC400_211109, 1302_QC500_211109	**09-Nov-2021**	**17-Nov-2021**	08-May-2022	✓	**17-Nov-2021**	08-May-2022	✓
HDPE (no PTFE) (EP231X)							
1302_MW115_211110, 1302_MW205_211110, 1302_MW112_211110, 1302_MW156_211110, 1302_MW180_211110, 1302_MW209_211110, 1302_QC301_211110, 1302_QC401_211110, 1302_QC101_211110, 1302_MW141_211110, 1302_MW139_211110, 1302_MW422_211110	**10-Nov-2021**	**17-Nov-2021**	09-May-2022	✓	**17-Nov-2021**	09-May-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC302_211111	**11-Nov-2021**	**17-Nov-2021**	10-May-2022	✓	**17-Nov-2021**	10-May-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC402_211111, 1302_MW133_211111, 1302_MW297_211111, 1302_MW103_211111, 1302_QC102_211111, 1302_MW107_211111, 1302_MW215_211111, 1302_MW128_211111, 1302_MW201_211111, 1302_MW211_211111, 1302_MW200_211111, 1302_QC103_211111, 1302_QC203_211111, 1302_MW176_211111 - Extra volume for lab QC, 1302_MW210_211111, 1302_MW185_211111, 1302_MW191_211111, 1302_MW190_211111, 1302_MW195_211111 - Extra vol for lab qc, 1302_MW194_211111	**11-Nov-2021**	**18-Nov-2021**	10-May-2022	✓	**18-Nov-2021**	10-May-2022	✓

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	56	**5.36**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	56	**5.36**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	56	**5.36**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	56	**3.57**	**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
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.

Australian Government
Department of Industry, Science, Energy and Resources

National Measurement Institute

SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [redacted]

Customer: AECOM AUSTRALIA PTY LTD

Address: LEVEL 8
FORTITUDE VALLEY QLD 4006

Email: [redacted]

Telephone:

Fax:

LABORATORY DETAILS

Lab: National Measurement Institute

Contact: [redacted]

Address: 105 Delhi Road, North Ryde, NSW
NSW 2113

Email: [redacted]

Telephone: [redacted]

Fax:

SAMPLE DETAILS

NMI Job Name: **AECO06/211116/1**

Total No. of Samples: **2**

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N21/025570	23-NOV-2021	1302_QC201_211110	WATER 10/11/2021 04:42 PM
N21/025571	23-NOV-2021	1302_QC202_211111	WATER 11/11/2021 10:54 AM

SAMPLE RECEIVED CONDITION

Date samples received: 16-NOV-2021

Sample received in good order: Yes

NMI Quotation no. provided:

Client purchase order number:

Temperature of samples: Chilled

Comments: ALL OK

Mode of Delivery: Courier

Additional Terms and Conditions

Incomplete / unclear information about samples or required testing will delay the start of the analysis work

If you require your Purchase Order (PO) number to be included on our invoice, please provide the number during sample submission and before the completion of work to avoid unnecessary delays and/or additional processing/handling fees.

The lodgement of an order or receipt of samples for NMI services referenced in this Sample Receipt Notification constitutes an acceptence of the current version of NMI Terms and Conditions or other applicable Terms referenced in the NMI Quotation. NMI Terms and Conditions are available on the web at
https://www.industry.gov.au/client-services/testing-and-analysis-services/chemical-and-biological-analysis-services-terms-and-conditions

REPORT OF ANALYSIS

Client	: AECOM AUSTRALIA PTY LTD	**Job No.**	: AECO06/211116/1
	LEVEL 8	**Quote No.**	: QT-02018
	540 WICKHAM STREET	**Order No.**	:
		Date Received	: 16-NOV-2021
Attention	: [redacted]	**Sampled By**	: CLIENT
Project Name	: 1302_RAAFDARWIN		
Your Client Services Manager	: [redacted]	**Phone**	: 02 9449 0169

Lab Reg No.	Sample Ref	Sample Description
N21/025570	1302_QC201_211110	WATER 10/11/2021 04:42 PM
N21/025571	1302_QC202_211111	WATER 11/11/2021 10:54 AM

Lab Reg No.		N21/025570	N21/025571			
Date Sampled		10-NOV-2021	11-NOV-2021			
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05	0.14			NR70
PFPeA (2706-90-3)	ug/L	0.055	0.26			NR70
PFHxA (307-24-4)	ug/L	0.25	1.4			NR70
PFHpA (375-85-9)	ug/L	0.028	0.20			NR70
PFOA (335-67-1)	ug/L	0.068	0.51			NR70
PFNA (375-95-1)	ug/L	<0.01	0.013			NR70
PFDA (335-76-2)	ug/L	<0.01	<0.01			NR70
PFUdA (2058-94-8)	ug/L	<0.01	<0.01			NR70
PFDoA (307-55-1)	ug/L	<0.01	<0.01			NR70
PFTrDA (72629-94-8)	ug/L	<0.02	<0.02			NR70
PFTeDA (376-06-7)	ug/L	<0.02	<0.02			NR70
PFHxDA (67905-19-5)	ug/L	<0.02	<0.02			NR70
PFODA (16517-11-6)	ug/L	<0.05	<0.05			NR70
FOUEA (70887-84-2)	ug/L	<0.01	<0.01			NR70
PFDS (335-77-3)	ug/L	<0.01	<0.01			NR70
PFPeS (2706-91-4)	ug/L	0.16	0.64			NR70
PFHxS (355-46-4)	ug/L	1.5	7.4			NR70
PFHpS (375-92-8)	ug/L	0.071	0.37			NR70
PFOS (1763-23-1)	ug/L	2.8	24			NR70
PFNS (68259-12-1)	ug/L	<0.01	<0.01			NR70
PFBS (375-73-5)	ug/L	0.17	0.54			NR70
PFOSA (754-91-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02	<0.02			NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02	<0.02			NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01	<0.01			NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05	<0.05			NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05			NR70
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01			NR70

REPORT OF ANALYSIS

Lab Reg No.		N21/025570	N21/025571			
Date Sampled		10-NOV-2021	11-NOV-2021			
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
6:2 FTS (27619-97-2)	ug/L	<0.01	<0.01			NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01			NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01			NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02			NR70
PFBA (Surrogate Recovery)	%	102	100			NR70
PFPeA (Surrogate Recovery)	%	100	98			NR70
PFHxA (Surrogate Recovery)	%	98	99			NR70
PFHpA (Surrogate Recovery)	%	94	103			NR70
PFOA (Surrogate Recovery)	%	95	101			NR70
PFNA (Surrogate Recovery)	%	94	80			NR70
PFDA (Surrogate Recovery)	%	97	105			NR70
PFUdA (Surrogate Recovery)	%	99	105			NR70
PFDoA (Surrogate Recovery)	%	90	95			NR70
PFTeDA (Surrogate Recovery)	%	86	100			NR70
PFHxDA (Surrogate Recovery)	%	101	103			NR70
FOUEA (Surrogate Recovery)	%	81	89			NR70
PFBS (Surrogate Recovery)	%	99	101			NR70
PFHxS (Surrogate Recovery)	%	93	98			NR70
PFOS (Surrogate Recovery)	%	109	106			NR70
PFOSA (Surrogate Recovery)	%	93	103			NR70
N-MeFOSA (Surrogate Recovery)	%	74	83			NR70
N-EtFOSA (Surrogate Recovery)	%	80	87			NR70
N-MeFOSAA (Surrogate Recovery)	%	89	96			NR70
N-EtFOSAA (Surrogate Recovery)	%	86	95			NR70
N-MeFOSE (Surrogate Recovery)	%	84	92			NR70
N-EtFOSE (Surrogate Recovery)	%	80	88			NR70
4:2 FTS (Surrogate Recovery)	%	91	80			NR70
6:2 FTS (Surrogate Recovery)	%	97	94			NR70
8:2 FTS (Surrogate Recovery)	%	74	92			NR70
8:2 diPAP (Surrogate Recovery)	%	81	102			NR70
Dates						
Date extracted		19-NOV-2021	19-NOV-2021			
Date analysed		19-NOV-2021	19-NOV-2021			

N21/025570
to
N21/025571

PFOS and PFHxS are quantified using a combined branched and linear standard,

REPORT OF ANALYSIS

linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

[redacted]

[redacted]
Organics - NSW
Accreditation No. 198

23-NOV-2021

ACCREDITED FOR TECHNICAL COMPETENCE

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1334888*

Measurement Uncertainty is available upon request.
Chemical Accreditation 198: 105 Delhi Road, North Ryde, NSW, 2113

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/211116/1 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	111	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	111	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	105	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	107	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	107	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	105	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	105	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	118	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	113	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	122	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	121	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	121	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	110	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	106	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	109	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	111	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	104	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	107	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	101	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	109	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	102	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	110	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	109	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	118	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	105	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	112	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	130	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	130	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	136	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	116	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	101	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference.

Signed: [redacted]

[redacted], **NMI-North Ryde**

Date: **22/11/2021**

Appendix G

Calibration Certificates

AECOM Imagine it. Delivered.

AECOM Australia Pty Ltd
34 McLachlan Street
Darwin NT 0800
GPO Box 3175
Darwin NT 0801
Australia
www.aecom.com

+61 8 8942 6200 tel
+61 8 8942 6299 fax
ABN 20 093 846 925

Equipment Information

Instrument: YSI Pro Plus

Serial Number: 19G102636

Equipment Check

	Enclosed	Comment
YSI Pro Plus Display	☑	
YSI Quatro Sonde	☑	
- YSI 1001 pH Probe	☑	
- YSI 1002 ORP Probe	☑	
- YSI 5560 Cond/Temp Probe	☑	
- YSI Polarographic DO Sensor	☑	
Flow Cell & Attachments (x2)	☑	
Probe Guard	☑	
Rubber Storage/Calibration Sleeve	☑	
Calibration Cup + Cap	☑	
YSI Cable Management Kit	☑	
YSI Pro Series ProComm II Kit	☑	
User Manual + Flow Cell Manual	☑	
Spare Batteries (x2) & Screwdriver	☑	
Laminated Quick Start Guide	☑	

Sensor Calibration Details

	Calibration Undertaken	Accuracy	Pass	Fail
Temperature	Factory Calibrated	±0.2°C	☑	☐
Dissolved Oxygen	☐ 100% Saturation	±2%	☑	☐
	Pressure Compensation ____hPa		☑	☐
Conductivity	☑ 12.88mS/cm	±0.5%	☑	☐
	☑ Check linearity at 1.413mS/cm	±0.5%	☑	☐
Salinity	Auto Calibrated	±1%	☑	☐
pH	☑ pH 7.00 7	± 0.2	☑	☐
	☑ pH 4 3.98	± 0.2	☑	☐
	☑ pH 10 10.02			
ORP	☐ ____mV at ____°C 230.7 23.7	±20mV	☑	☐

@ 24°C.

This is to certify that where possible, this instrument has been calibrated in accordance with the manufacturer's calibration procedure as recommended in the instrument service manual.

Name: [redacted]

Signature: [redacted]

Date: 8/11/21

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Equipment Information

Instrument:

Serial Number: 19610263 6

Equipment Check

	Enclosed	Comment
YSI Pro Plus Display	☐	
YSI Quatro Sonde	☐	
- YSI 1001 pH Probe	☐	
- YSI 1002 ORP Probe	☐	
- YSI 5560 Cond/Temp Probe	☐	
- YSI Polarographic DO Sensor	☐	
Flow Cell & Attachments (x2)	☐	
Probe Guard	☐	
Rubber Storage/Calibration Sleeve	☐	
Calibration Cup + Cap	☐	
YSI Cable Management Kit	☐	
YSI Pro Series ProComm II Kit	☐	
User Manual + Flow Cell Manual	☐	
Spare Batteries (x2) & Screwdriver	☐	
Laminated Quick Start Guide	☐	

Sensor Calibration Details

	Calibration Undertaken	Accuracy	Pass	Fail
Temperature	Factory Calibrated	±0.2°C	☐	☐
Dissolved Oxygen	☐ 100% Saturation	±2%	☐	☐
	Pressure Compensation ____hPa		☐	☐
Conductivity	☐ 12.88mS/cm	±0.5%	☐	☐
	☐ Check linearity at 1.413mS/cm	±0.5%	☐	☐
Salinity	Auto Calibrated	±1%	☐	☐
pH	☐ pH 7.00 6.81	± 0.2	☐	☐
	☐ pH 4 14.2	± 0.2	☐	☐
	☐ pH 10			
ORP	☐ ____mV at ____°C	±20mV	☐	☐
	233 29.2			

This is to certify that where possible, this instrument has been calibrated in accordance with the manufacturer's calibration procedure as recommended in the instrument service manual.

Name:....

Signature [redacted]

Date: 10/12/21

11.10.2021

Parameter.	Our YSI		Newly Cal YSI	
	Bump.	Cal?	Bump	Cal?
pH4	3.90 ↓		6.42 -	
EC 12.88	10361$_\mu$		10891$_\mu$	
EC 1413	1281$_\mu$		1475$_\mu$	
pH 7	6.52 ↑		6.48 ↓	
pH 10	9.~~60~~4		6.50 -	
ORP.	220.0 @ 28.5°C		202.9 @ 28.4°C	
°C				

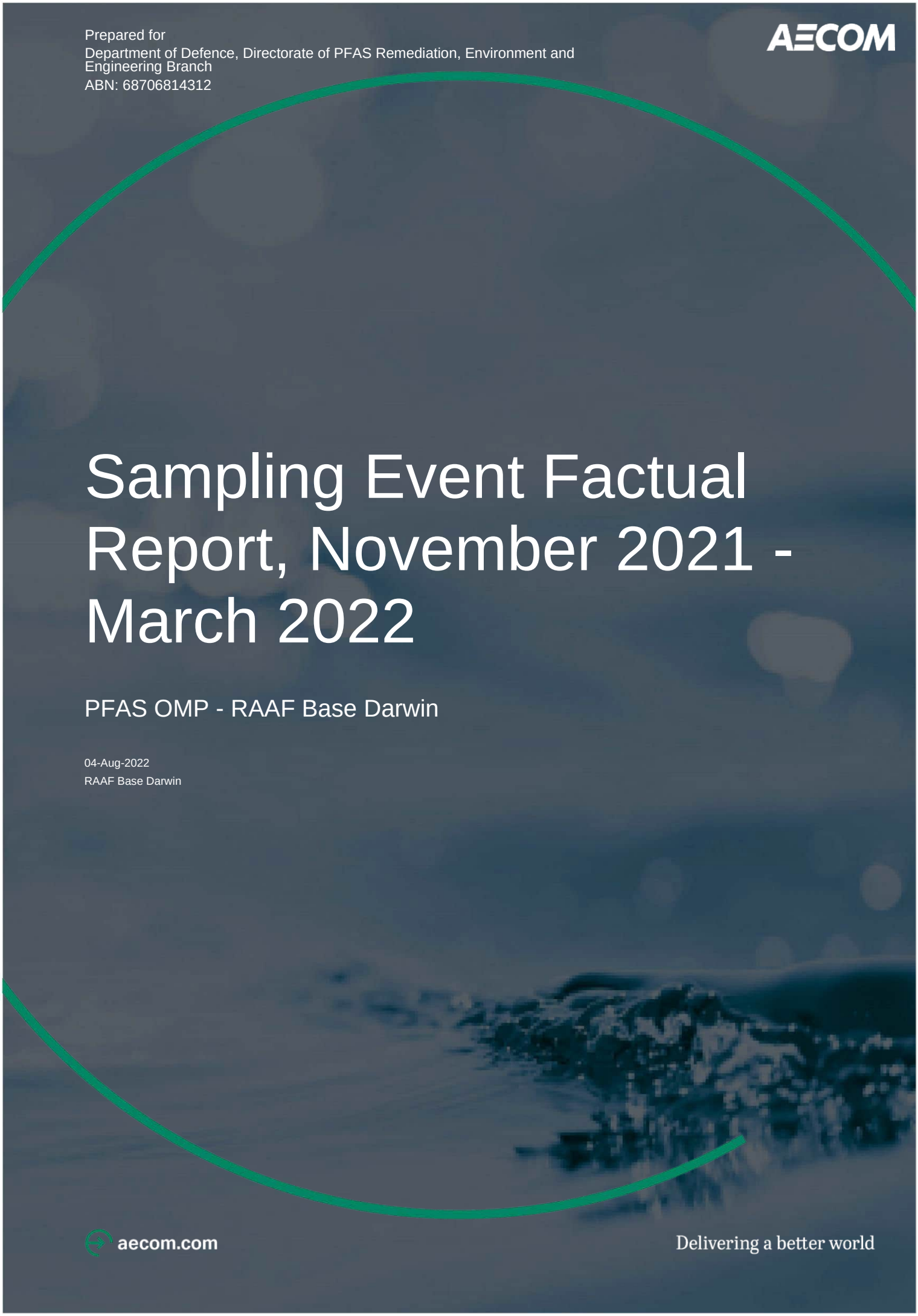
Prepared for
Department of Defence, Directorate of PFAS Remediation, Environment and Engineering Branch
ABN: 68706814312

AECOM

Sampling Event Factual Report, November 2021 - March 2022

PFAS OMP - RAAF Base Darwin

04-Aug-2022
RAAF Base Darwin



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Sampling Event Factual Report, November 2021 - March 2022

PFAS OMP - RAAF Base Darwin

Client: Department of Defence, Directorate of PFAS Remediation, Environment and Engineering Branch

ABN: 68706814312

Prepared by

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04-Aug-2022

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Reviewed by	David Steele

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Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
0	04-Aug-2022	Final	James Guzman Principal Environmental Scientist	

Table of Contents

List of Tables (in Text)

Abbreviations

Abbreviation	Term
AECOM	AECOM Australia Pty Ltd
ALS	Australian Laboratory Services Pty Ltd
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999
BOM	Bureau of Meteorology
DCMM	Defence Contamination Management Manual
Defence	Department of Defence
DO	Dissolved Oxygen
DoH	Department of Health
DIA	Darwin International Airport
EC	Electrical Conductivity
HEPA	Heads of Environment Protection Authority
LOR	Limit of Reporting
mAHD	meters Australian Height Datum
mbtoc	metres below top of casing
MW	Monitoring Well
NATA	National Association of Testing Authorities
NEMP	National Environmental Management Plan
NEPC	National Environment Protection Council
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
NT	Northern Territory
NTU	Nephelometric Turbidity Unit
NSW	New South Wales
OMP	Ongoing Monitoring Plan
ORP	Oxidation Reduction Potential
PFAS	Per- and poly-fluoroalkyl substances
PFHxS	Perfluorohexanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance and Quality Control
RAAF	Royal Australian Air Force
SAQP	Sampling and Analysis Quality Plan
SW	Surface Water
km	kilometre
m	metre
g	gram
L	litre

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Plan (OMP) outlined in *Appendix F* of the *PFAS Management Area Plan (PMAP)* (Department of Defence, 2019a) at RAAF Base Darwin (the 'Site') in the Northern Territory. The locations of the Site and Management Area are shown in Figure 1 in Appendix A. The OMP for the Site outlines the requirement to complete annual biota sampling and biannual groundwater and surface water sampling.

The primary purpose of the OMP program is to monitor changes to the PFAS impact in groundwater and surface water pathways associated with sources of PFAS as initially assessed through the detailed site investigation phase of works. Changes may result from the specific or cumulative impact of remediation or containment actions, existing transportation trends, and changes to hydrogeology or weather events.

The monitoring program at RAAF Base Darwin includes a regime of groundwater, surface water and biota sampling to capture these changes in the long term, to enable Defence to maintain an up-to-date understanding of temporal and spatial distribution, concentration, and transport of PFAS contaminants.

1.2 Objectives

The objective of the OMP is to provide information on changes to PFAS contamination originating from Defence property to inform risk management decisions by Defence and Territory agencies to protect human health and the environment.

The purpose of this PFAS OMP factual report is to summarise the scope of works and findings for the annual biota and paired surface water sampling, the twice in wet season surface water sampling and the biannual end of wet season groundwater sampling conducted in accordance with the Sampling and Analysis Quality Plan (SAQP) (AECOM, 2021).

While biota sample collection was during the early-wet season in November 2021 , sample preparation and analysis was delayed due to COVID-19 restrictions until the new year and is thus reported herein.

This mid- to late-wet season report has been prepared in accordance with the *PFAS OMP Factual Report Guidance,* v2 May 2021 (Department of Defence, 2021).

An annual interpretive report will be subsequently developed for the purpose of assessing the data collected during the discrete monitoring events completed over the preceding 12-month period and will include assessment of environmental variability and any statistically significant trends in PFAS concentrations.

2.0 Scope of work

The biota, groundwater and surface water sampling events were completed in general accordance with the SAQP (AECOM, 2021), see Section 2.2 for deviations from the SAQP.

Prior to commencement of the sampling events, the SAQP was reviewed to ensure compliance with the following:

- The OMP (Department of Defence, 2019a)
- PFAS National Environmental Management Plan (PFAS NEMP 2.0) version 2.0 (HEPA, 2020)
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended in 2013) (ASC NEPM, 2013)
- Defence Routine Environment Water Quality Monitoring Manual (Department of Defence, 2019c)
- AS/NZ 5667:1998 Water quality – Sampling (AS/NZS, 1998)
- Water Quality Guidelines; and
- Relevant Territory regulatory guidelines.

In summary, the scope of works for the mid- to late-wet season included the following:

- November 2021:
  - Annual aquatic biota samples (fish and aquatic invertebrate) was completed in November 2021 from six annual locations using a combination of netting, trapping and hand collection. Laboratory analysis and review was completed in March 2022.
  - Annual surface water sampling at the above-mentioned aquatic biota sample locations. Refer to Table 1 below for further descriptions of locations and Appendix A – Figure 2 for an aerial map presenting locations.
- January 2022:
  - Twice in wet season surface water samples from 22 sample locations during a heavy rainfall event (“first-flush”) for the early-wet season sampling (refer to **Error! Reference source not found.** below and Appendix A – Figure 2 for specific locations).
- March 2022:
  - Biannual groundwater gauging and sampling at 31 monitoring wells. (refer to Table 2 below, and Appendix A – Figure 3 for specific locations).
  - Twice in wet season surface water samples from 22 sample locations for the mid- to late-wet season sampling (refer to **Error! Reference source not found.** and Appendix A – Figure 2 for specific locations).
  - Biannual groundwater gauging and sampling from four monitoring wells for the Base-wide Mass Flux PFAS Investigation (refer to Table 2 below, and Appendix A – Figure 3 for specific locations).
  - Monthly in wet season collection of surface water samples from three locations for the Base-wide Mass Flux PFAS Investigation (refer to **Error! Reference source not found.**and Appendix A – Figure 2 for specific locations).
- Collection of relevant quality assurance and quality control (QA/QC) samples for groundwater, surface water and biota sampling.
- Analysis of biota, groundwater, and surface water samples for PFAS analytes at the standard limit of reporting (LOR).
- Data management of the OMP field and laboratory data in the Defence ESdat database.
- Preparation of this Sampling Event Factual Report.

2.1 Planned monitoring locations

The monitoring locations outlined within the SAQP (AECOM, 2021) for the biota sampling, groundwater sampling and surface water sampling events are outlined below in their respective tables. Deviations from the planned sampling are detailed in Section 2.2.

Table 1 Annual biota and paired surface water sampling locations (collected in November 2021 then processed in March 2022)

Area	Description	Sampling locations	Indicator/target capture	No. of locations	Total
Off-Base (biota)	Rapid Creek Freshwater – Upstream of Trower Road	BIOFA024, BIOFA26, BIOFA028	Crustaceans	3	6 locations
	Ludmilla Creek – Estuarine area	BIOFA016	Molluscs	1	
	Rapid Creek mouth – Casuarina Drive	BIOFA007	Diadromous or estuarine fish	1	
	Ludmilla Creek – Boat Ramp	BIOFA018	Diadromous or estuarine fish	1	
Off-Base (surface water)	Rapid Creek	BIOFA007, BIOFA028, BIOFA026, BIOFA024	Water	4	6 locations
	Ludmilla Creek	BIOFA018, BIOFA016	Water	2	

* The biota sampling locations in Figure 2 (Appendix A) are approximate, as exact locations vary depending of habitat available on the day of sampling.

Table 2 Biannual groundwater sampling locations sampled in March 2022

Area	Description	Sampling locations	Number of wells/bores	Total
On-Base	Former fuel farm 1	MW215**	1	19 Locations
	Former fuel farm 5	MW297, MW112	2	
	Former fuel farms	MW303, MW133, MW205	3	
	Former fire training area 1	MW422, MW139	2	
	Current fire training area	MW240, MW241	2	
	RAAF fire station	MW103	1	
	Former ARFF fire station	MW115	1	
	Source area downgradient transect	MW107, MW128	2	
	Hangar 31	MW405**	1	
	Southern boundary of site	MW141, MW144	2	
	Western boundary of site	MW148*,	1	
	Rapid Creek – eastern end	MW156	1	
Off-Base	Former fire training area 2, Darwin International Airport (DIA)	MW197	1	12 Locations
	Off-base – North	MW185	1	
	Rapid Creek	MW190, MW191, MW194, MW195	4	

Area	Description	Sampling locations	Number of wells/bores	Total
	Off-base – South	MW176, MW180, MW200, MW209	4	
	Off-base – South west	MW211	1	
	Off-base – West	MW210	1	

* Contingency location MW201 sampled in lieu of MW148 due to damage to the PVC casing and removal of the in-situ HydraSleeve.

** Well inaccessible due to construction refer Table 14 for further details.

Table 3 Twice in wet season surface water sampling locations in January 2022

Area	Description	Sampling locations	Number of locations	Total
On-Base	Surface water flow – current fire training ground	SW156	1	7 Locations
	Stormwater pipe – Airside operations	SW160	1	
	Stormwater – southern boundary	SW162	1	
	Surface water drain – Eastern end of runway	SW170	1	
	Surface water drain – near Former Fuel Farm 5	SW178	1	
	Surface water drain – north of Former Fuel Farms 4 & 6	SW181	1	
	Rapid Creek	SW152	1	
Off-Base	Rapid Creek	SW104, SW106, SW108, SW109, SW112, SW113	6	15 Locations
	DIA drain to Rapid Creek	SW114, SW115, SW168	3	
	Ludmilla Creek	SW120, SW124, SW125	3	
	Reichardt Creek	SW132, SW133	2	
	Drain to Sadgroves Creek	SW143	1	

Table 4 Twice in wet season surface water sample locations in March 2022

Area	Description	Sampling locations	Number of locations	Total
On-Base	Surface water flow – Current fire training ground	SW156*	1	7 Locations
	Stormwater pipe – Airside operations	SW160*	1	
	Stormwater – Southern boundary	SW162	1	
	Surface water drain – Eastern end of runway	SW170^	1	
	Surface water drain – near former Fuel Farm 5	SW178	1	
	Surface water drain – North of Former Fuel Farms 4 & 6	SW181	1	
	Rapid Creek	SW152	1	

Area	Description	Sampling locations	Number of locations	Total
Off-Base	Rapid Creek	SW104**, SW106, SW108, SW109^, SW112, SW113	6	16 Locations
	DIA drain to Rapid Creek	SW114, SW115, SW168	3	
	Ludmilla Creek	SW120, SW124, SW125	3	
	Reichardt Creek	SW132, SW133	2	
	Drain to Sadgroves Creek	SW143	1	

*Location not sampled, dry.

**Location not sampled, due to impassable hazardous vegetation.

^ Also Base-wide Mass Flux Investigation location

Table 5 Base-wide Mass Flux biannual groundwater locations completed in March 2022

Area	Description	Sampling locations	Number of wells/bores	Total
On-Base	Current fire training area	MW453	1	4 Locations
	Western boundary of site	MW451, MW452	2	
	Eastern end of runway	MW454	1	

Table 6 Base-wide Mass Flux monthly wet season surface water locations completed twice in March 2022

Area	Description	Sampling locations	Number of wells/bores	Total
On-Base	Surface water drain – Eastern end of runway	SW170	1	1 Location
Off-Base	Rapid Creek	SW109	1	2 Locations
	Osgood Road	SW300	1	

2.2 Deviations from the SAQP

The works for the twice in wet season surface water sampling in January 2022 was completed in accordance with the SAQP (AECOM, 2021) with no deviations. The annual biota and paired surface water sampling in November 2021, biannual groundwater monitoring in March 2022 and the twice in wet season surface water sampling in March 2022 included some deviations as outlined in their respective tables below.

Mass flux sampling was added to the scope to provide data to the Base PFAS lead consultant for their mass flux assessment. This scope had not been incorporated into the SAQP (AECOM, 2021) prior to sampling taking place and is therefore considered a deviation from the SAQP. Future version of the SAQP will include all appropriate scope.

Table 7 Deviations from the SAQP during the annual biota and paired surface water sampling in November 2021

SAQP	November-December sampling event	Impact on OMP
Proposed annual schedule for sampling and reporting	During the November 2021 sampling event, NT Fisheries were successful in collecting and completing the aquatic biota for the RAAF Darwin as outlined in the SAQP (AECOM, 2021). However, due to Covid-19 restrictions placed by the NT Government, the scheduled aquatic	No impact. The results from the November and December biota sampling event are reported in this factual report.

SAQP	November-December sampling event	Impact on OMP
	biologist who leads biota sample processing could not travel interstate. The samples were frozen until January when the processing was undertaken.	
Surface water sampling methodology and schedule	During the November 2021 biota sampling event, inter-laboratory duplicates were not taken however intra-laboratory duplicates were taken at the required frequency.	Minimal, potential to report biased low concentrations.
Field observations	Aquatic biota was collected by NT Fisheries without the oversite of primary subcontractor Eco Logical. As a result, some field observations such as tidal conditions and weather were not recorded during sample collection.	Minimal impact as sample collection was successful and site conditions during collection have minimal to no impact on sample collection and analysis.

Table 8 Deviation from the SAQP during the biannual groundwater sampling event in March 2022.

SAQP	March sampling event	Impact on OMP
31 groundwater locations identified to be sampled as part of the biannual sampling event	During the March groundwater event, samples were collected from 30 of 31 wells: • MW215 was unable to be sampled due to redevelopment construction hindering access to the well. Contingency MW121 was unable to be located and presumed destroyed or decommissioned. • Location MW148 was unable to be gauged and the HydraSleeve at this location was unable to be retrieved due to bent PVC casing in the well. PMAP identified alternative location MW201 was gauged and sampled in lieu.	• By not sampling from MW215, there is a data gap for monitoring PFAS concentrations within the Former Fuel Farm 1 source area. However, the impact to tracking PFAS movement in the vicinity is minimised by monitoring data collected from downgradient monitoring locations MW103 and MW107 • No impact – PMAP identified alternative location MW201 sampled in lieu.
Gauging of all locations within 24 hours	Locations were gauged over a four-day period.	Minimal impact. Contours generated from the March 2022 monitoring event are consistent with previous contouring and result in the same interpretation of groundwater flow.
Deploying hydrasleeves one metre below the water surface.	Hydrasleeves were not deployed at the depth indicated in the SAQP.	Minimal impact. The depth location is based on previous data that suggests higher potential PFAS concentrations are found within the top one metre below the groundwater surface. Results from the groundwater sampling event are generally within the historical ranges and there is

SAQP	March sampling event	Impact on OMP
		no indicator that collecting at lower depths have had a material impact on the results.

Table 9 Deviations from the SAQP during the twice in wet season surface water sampling event in January 2022.

SAQP	January sampling event	Impact on OMP
No deviations	Nil	Nil

Table 10 Deviations from the SAQP during the twice in wet season surface water sampling in March 2022.

SAQP	March sampling event	Impact on OMP
22 surface water locations are identified to be sampled as part of the sampling event	During the March surface water event, samples were collected from 19 of 22 locations. The following was not collected: • SW104 was unable to be sampled due to hazardous vegetation making it impossible to access. • Locations SW156 and SW160 were dry during the monitoring event and were not sampled.	• Monitoring location SW104 monitors PFAS within Rapid Creek. As there are both upgradient and downgradient sample locations within Rapid Creek, not sampling this location has minimal impact of the overall data interpretation for the Rapid Creek drainage. • Monitoring locations SW156 and SW160 monitor surface water flow from the current fire training area and monitors PFAS in on-Base stormwater pipe, respectively. Not collecting from SW156 decreases data available to understand the impact of PFAS mobilised in surface water coming from the fire training area. Similarly, Not collecting from SW160 decreases data available to understand the impact of PFAS mobilised in surface water coming off the western base boundary. However, monitoring location SW125 does collect PFAS in surface water data west of the Base boundary and closes the overall gap in surface water PFAS impacts in this area.

Table 11 Deviation from the SAQP during the biannual PFAS Mass Flux groundwater sampling event in March 2022.

SAQP	March sampling event	Impact on OMP
Not included in SAQP	Nil	Nil

Table 12 Deviation from the SAQP during the monthly wet season PFAS Mass Flux surface water sampling event in March 2022.

SAQP	March sampling event	Impact on OMP
Collection of surface water at a frequency of monthly during wet season	Collection of samples twice in March due to heavy rainfall and staff availability triggering collection.	No impact – additional data point for these locations.

SAQP	March sampling event	Impact on OMP
	Samples were not collected in February, so early March and late March is a consolation.	
Collection of surface water at three locations	Two of three locations were sampled for surface water: • SW300 had insufficient flow during the 2 March 2022 sampling event • SW300 was dry during the 14 March 2022 sampling event	Minimal impact – missing data gap for SW300

3.0 Sampling methodology

3.1 Sampling methodology

The methodology adopted for the annual biota sampling conducted in November-December 2021, biannual groundwater sampling event in March 2022 and surface water sampling events in January and March 2022 were in general accordance with the SAQP (AECOM, 2021) and is summarised in Table 13 below.

Table 13 Sampling methodology

Item	Details
Aquatic biota sampling	
Aquatic biota target samples	Target species for each identified sample location were based on those that are recognised as consumed by the public from the following three groups: • Diadromous or estuarine fish (Barramundi, Flathead, Javelin, Sweetlips, Mullet, Rock Cod, Queenfish, Jewfish, etc.) • Molluscs (Longbums [Telescopium] and Whelk) • Crustaceans (Redclaw Crayfish [C. quadricarinatus.])
Aquatic biota sampling methodology	Sampling was conducted by Eco Logical Australia Pty Ltd and the Department of Fisheries (NT) between the 8 November and 3 December 2021. Ethics approvals and Fisheries/Parks & Wildlife licenses were obtained prior to biota sample collection. Estuarine fish were collected using 4-6-inch gill nets set three hours before low tide. Nets were continuously monitored from a small boat and cleared when movement was detected. Any non-target species were released immediately and where targeted biota species were identified, they were measured, weighed and euthanised humanely in accordance with the animal ethics permits conditions. Redclaw were captured using Opera House traps baited with raw beef (purchased from a supermarket). Traps were set overnight in freshwater pools and collected in the early morning. Longbums were hand-collected during low tide from the mangroves. Redclaw and Longbums were rinsed prior to being stored in snap-lock bags, euthanised by freezing and preserved frozen until preparation at NT Fisheries wet room laboratories. Samples were prepared for analysis at the Department of Fisheries laboratory prior to dispatching to the primary laboratory. This included the removal of scales/shell, head, and internal organs. Fillets were taken with skin intact and homogenised prior to sub-sampling and analysis. Samples were prepared based on the following procedure: • For Target fish: - Used opened bag as board cover - Cleaned knife/blade with deionised water - For large fish the complete tissue samples of edible flesh was collected. For smaller fish, samples were provided whole with entrails removed. • For Redclaw Crayfish: - Rinsed in deionised water - Composited whole as 50-100g samples (about 3-5 individuals per sample).

Item	Details
	• For Longbum: - Shells placed inside a sample bag and carefully smashed with a hammer, then tissue extracted with forceps - Tissue rinsed with deionised water - Composited 10 individuals as a sample • The weight, length, species, and location caught were recorded.
QAQC samples	Field QA/QC samples collected included rinsate and split samples (intra-laboratory duplicates) which are described as the following: • Rinsate samples were taken from decontaminated sample processing equipment (filleting knife) • Split samples were taken from fin fish to ensure homogeneity for intra-laboratory analysis rather than composite samples of crustaceans. Refer to Appendix D for data validation report of the results.
Sample analysis	All samples collected were tested for the extended suite of PFAS. Samples were submitted to the primary laboratory for analysis in accordance with the SAQP. Australian Laboratory Services Environmental (ALS) Sydney, NSW was used as the primary laboratory. ALS methods for analyses were certified by the National Association of Testing Authorities (NATA). Chain of custody (COC) forms and laboratory certificates are presented in Appendix E and Appendix F, respectively.
Groundwater sampling	
Groundwater gauging	Groundwater gauging was conducted prior to collection of groundwater samples using an oil/water interface probe. Measurements included depth to light non-aqueous phase liquid (LNAPL) (if any), depth to water and total depth (if no product).
Field parameters	Where appropriate, field parameters were recorded ex-situ using a calibrated YSI Pro water quality meter (refer to Appendix G for calibration certificate). Parameters recorded consisted of the following: temperature (ºC), electrical conductivity (EC), dissolved oxygen (DO), reduction- oxidation (redox) potential (ORP) and pH. Observations of odour, colour and clarity (turbidity) of groundwater was recorded at each site.
Sampling methodology	Groundwater samples were collected from all accessible wells using the no-purge HydraSleeves™ method installed one-metre below the standing water level of each well for a minimum of 24 hours prior to the sampling. This was based on a review of the well construction log.
QAQC samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples, rinsate, field blank and trip blank samples. Refer to Refer to Appendix D for data validation report of the results.
Sample analysis	ALS Environmental Sydney, NSW was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW and/or ALS Brisbane, QLD was used as the secondary laboratory. ALS and NMI methods for analyses were certified by the National Association of Testing Authorities. COC forms and laboratory certificates are presented in Appendix E and Appendix F, respectively.
Surface water sampling	
First flush sampling	The first flush sampling event is triggered by consecutive days of heavy rainfall (approximately >100 mm). The first flush sampling event was scheduled to target a forecasted rainfall event of equal to or greater than expected rainfall.
Field parameters	Where appropriate, field parameters were recorded ex-situ using a calibrated YSI Pro water quality meter (refer to Appendix G for calibration certificate). Parameters recorded consisted of the following: temperature, electrical conductivity, dissolved oxygen, redox potential and pH. Observations of odour, colour and clarity (turbidity) of groundwater was recorded at each site.

Item	Details
Sampling methodology	Surface water samples were collected from approximately 0.1 metres below the water surface to minimise collection of sediment or floating materials in the samples. At each location, a new, laboratory supplied container was lowered into the water, using an aluminium sampling pole, with the cap immediately applied once the container was full.
QAQC samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples, rinsate, field blank and trip blank samples. Refer to Refer to Appendix D for data validation report of the results
Sample analysis	ALS Environmental Sydney, NSW was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW and/or ALS Brisbane, QLD was used as the secondary laboratory. ALS and NMI methods for analyses were certified by the National Association of Testing Authorities. COC forms and laboratory certificates are presented in Appendix E and Appendix F, respectively.

3.2 Adopted screening criteria

Screening criteria were selected on the basis of national guidance in the form of the PFAS National Environmental Management Plan, Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset are summarised in Table 14 includes the following:

- Department of Health (DoH) Health Based Guidance Values for PFAS for use in site investigations in Australia (Department of Health, 2019).
- Heads of the Environment Protection Authority (HEPA), PFAS National Environmental Management Plan (PFAS NEMP 2.0) (HEPA, 2020).
- National Health and Medical Research Council (NHMRC), Guidance on PFAS in Recreational Water (NHMRC, 2019).
- National Environment Protection (Assessment of Site Contamination) Measure 1999, Schedule B1, as amended in 2013 (ASC NEPM, 2013)

Table 14 Summary of adopted screening criteria for consumption of aquatic biota

Pathway	Compound	Criteria	Comment/reference
Human health receptors			
Crustaceans	PFOS and PFOS + PFHxS	65 µg/kg	Department of Health (2019) *Derivation: Children 2-6 years, median consumption* Occasionally consumed food. Trigger criteria for investigation for crustaceans apply to molluscs due to the small number of consumers of molluscs.
	PFOA	520 µg/kg	
Finfish	PFOS and PFOS + PFHxS	5.2 µg/kg	Department of Health (2019). *Derivation: Children 2-6 years, P90 consumption*
	PFOA	41 µg/kg	

Table 15 Summary of adopted screening criteria for groundwater and surface water

Pathway	Compound	Criteria	Comment/reference
Human health receptors			
	PFOS + PFHxS	0.07 µg/L	

Pathway	Compound	Criteria	Comment/reference
Human health receptors			
Drinking water - groundwater	PFOA	0.56 µg/L	These values are from the PFAS NEMP 2.0 (HEPA, 2020). *All surface water and groundwater results are compared to these criteria.*
Recreational use – surface water	PFOS + PFHxS	2 µg/L	These values are from PFAS NEMP2.0 (HEPA, 2020). *All surface water results are compared to these criteria.*
	PFOA	10 µg/L	
Ecological receptors			
Freshwater - 99% species protection	PFOS	0.00023 µg/L	These values are from the PFAS NEMP 2.0 (HEPA, 2020). The 99% level of protection has been applied for slightly to moderately disturbed ecosystems. This approach is generally adopted for chemicals that bioaccumulate and biomagnify in wildlife. For the purposes of preliminary screening of analytical water results, the laboratory LOR will be adopted rather than sole use of the criteria value. *All surface water and groundwater results will be compared to these criteria.*
	PFOA	19 µg/L	

3.3 Data quality objectives and data validation

The data quality objectives (DQOs) and data quality indicators (DQIs) adopted for these works are presented in the SAQP (AECOM, 2021).

The analytical data can be used as a basis for interpretation, noting the following:

- Field inter-laboratory RPDs for water samples were reported within control limits, with the exception of the following (the higher concentration in **bold**):
  - **1302_SW170_220113** & 1302_QC200_220113 for sum of PFAS (70%), sum of PFHxS and PFOS (71%), PFOS (75%) and PFHxS (60%)
  - **1302_SW106_220117** & 1302_QC201_220117 for sum of PFAS (134%), sum of PFHxS and PFOS (134%)**,** PFOS (122%) and PFHxS (160%)
  - **1302_MW128_220307** & 1302_QC200_220307 for sum of PFAS (35%), sum of PFHxS and PFOS (41%), PFOS (39%) and PFHxS (47%)
  - **1302_MW241_220309** & 1302_QC201_220309 for 8:2 FTS (55%), PFBS (60%), PFHpS (34%), PFHxA (80%), PFPeA (62%), sum of PFHxS & PFOS (45%), PFOS (45%), PFOA (58%) and PFHxS (47%)
  - 1302_MW241_220309 & **1302_QC201_220309** for sum of PFAS (189%)
  - **1302_SW170_220314** & 1302_QC200_220314 for sum of PFAS (47%), PFHxS and PFOS (52%), PFOS (59%)
- **1302_SW106_220315** & 1302_QC201_220315 for sum of PFAS (41%), sum of PFHxS and PFOS (51%) and PFOS (65%) The primary and secondary laboratories re-analysed and confirmed these results. This apparent lack of precision should be taken into consideration when interpreting concentrations for PFAS concentrations close to guidelines for sum of PFHxS and PFOS, PFOS and PFOA. As all concentrations of these analytes were reported well above the adopted guidelines and for each location concentrations for the primary, intra-laboratory and intra-laboratory samples were reported at similar orders of magnitude, it is not considered that the RPD

exceedances reported change the overall interpretation of results. It is also noted that these locations have historically exceeded the adopted criteria.

- As there are no adopted guideline values for 8:2 FTS, PFBS, PFHpS, PFPeA and sum of PFAS, the elevated RPD is not expected to affect interpretation of results against guidelines. However, the elevated RPDs should be taken into consideration when using the data quantitatively. As these analytes are not considered key analytes for the OMP, the reported RPD exceedances are not considered to change the overall interpretation of results.
- The potential exists for concentrations of key COPC PFOS to be above the PFAS NEMP 2.0 99% freshwater guideline, but below the laboratory LOR. This should be taken into consideration when interpreting data and using data quantitatively.

The data validation report is provided in Appendix D.

Data validation procedure employed in the assessment of the field and laboratory QA/QC data are indicative that the overall quality of the analytical data produced is acceptably reliable for the purpose of this report.

All data collected during this event has been reviewed and uploaded to the Defence ESdat database in accordance with Defence Contamination Management Manual (DCMM) (Department of Defence, 2019b) Annex L requirements.

4.0 Field observations and results

4.1 General field observations

Table 16 General field observations

Item	Observation
Weather conditions	Weather for the November-December aquatic biota event was observed to be partly cloudy, hot, and humid during the sampling event. Temperature ranged from 27.0 °C to 36.6 °C, and low to high relative humidity from 16 – 96 %. Precipitation was recorded across seven days of the November-December event with a total of 81 mm. (Darwin Airport weather station, 014015) (Bureau of Meteorology, 2021).
	Weather for the January surface water event was observed to be partly cloudy, hot and humid during the sampling event. Temperature ranged from 27.1 °C to 31.2 °C, with medium to high relative humidity from 70 – 93 %. Precipitation was recorded across all three days of the event with 14.2 mm on 13 January, 4.0 mm on 14 January and 15.4 mm on 17 January 2022. (Darwin Airport weather station, 014015) (Bureau of Meteorology, 2021).
	Weather for the March groundwater event was observed to be partly cloudy, hot and humid during the sampling event. Temperature ranged from 28.1 °C to 35.3 °C, and medium to high relative humidity from 53 – 85 %. Precipitation was recorded across two days of the event with 0.8 mm on 7 March and 0.6 mm on 8 March 2022. (Darwin Airport weather station, 014015) (Bureau of Meteorology, 2021).
	Weather for the March surface water event was observed to be partly cloudy, hot, and humid during the sampling event. Temperature ranged from 27.1 °C to 32.7 °C, and medium to high relative humidity from 63 – 90 %. Precipitation was recorded across all three days of the event with 31.6 mm on 14 March, 21.0 mm on 15 March and 0.2 mm on 16 March 2022. (Darwin Airport weather station, 014015) (Bureau of Meteorology, 2021).
Estate management works or training activities	During the sampling events, no notable estate works, or training activities were observed in the vicinity of sampling locations with the exception of the following: • Current AIR7000 construction activities by Sitzler Results are generally consistent with previous sampling rounds and any activities prior to the sampling event do not appear to have had any impact on analytical results of field observations.

4.2 Biota

4.2.1 Field observations and field measurements

Table 17 Biota observations

Item	Observation
Field Observations	Sample descriptions were provided by NT Fisheries field staff following the biota sampling event via an excel spreadsheet, noting species type, fillet or guts, length, weight and number of specimens. These are presented in Appendix B - Table T1.
Access and Sample Collection	All monitoring locations were accessible and able to be sampled. Fish and invertebrate species collected and analysed included: • Ludmilla Creek (BIOFA018) • Pikey Bream (*Acanthopagrus pacificus*) • Blue Salmon (*Eleutheronema tetradactylum*) • Forktail Catfish 1 (*Neoarius sp.1*) • Forktail Catfish 2 (*Neoarius sp.2*) • Hawaiian Giant Herring (*Elops hawaiensis*) • Flathead (*Platycephalidae (family)*)

Item	Observation
	• Archerfish (*Toxotes chatareus*) • Trevally (*Caranx sp.*) • Ponyfish (*Leiognathus equulus*) • Sea Mullet (*Mugil cephalus*) • Rapid Creek (BIOFA007): • Blue Salmon (*Eleutheronema tetradactylum*) • Ponyfish (Leiognathus equulus) • Milkfish (*Chanos chanos*) • Tarpon (*Megalops cyprinoides*) • Forktail Catfish (*Neoarius sp.1)* • Forktail Catfish (*Neoarius sp.2)* • Sea Mullet (*Mugil cephalus*) • Trevally (*Caranx sp.*) • Ludmilla Creek (BIOFA016) • Long Bum (*Telescopium telescopium*) • Giant Mangrove Whelk (*Terabralia palustris*) • Rapid Creek (BIOFA028, BIOFA026 and BIOFA024) • Redclaw Crayfish (*Cherux quadricarinatus*)

4.2.2 PFAS biota analytical results

Results from the November biota sampling event reported 42 of 52 primary samples above the LOR for PFAS. Biota samples that exceeded the adopted criteria included seven finfish biota samples and two invertebrate biota samples. The PFAS biota analytical results are presented in Appendix B - Table T1.

4.3 Groundwater

4.3.1 Field observations and field measurements

Table 18 Groundwater observations and field measurements

Item	Observations and field measurements
Fieldwork dates	Groundwater gauging and Hydrasleeve™ installation was completed subsequentially completed between 2 and 4 March 2022. Hydrasleeve™ retrieval, groundwater sampling and collection of field parameters were subsequentially completed between 7 and 10 March 2022 a minimum of 24 hours after installation.
Access and sample collection	All monitoring wells and bores were accessible and able to be sampled with the exception of the following: • Monitoring well MW148 was not sampled due to having a bent casing which precluded retrieval of the Hydrasleeve™. MW201 was sampled in lieu. • Monitoring well MW215 was inaccessible due to construction activities and was unable to be accessed. Contingency well MW121 was unable to be located and expected to be decommissioned or lost during construction of new facilities.
Monitoring well network condition	The monitoring well network was generally in good condition and with the exception of MW148 – bent PVC casing pipe, unable to retrieve Hydrasleeve™.
Contamination observation	Monitoring wells MW133, MW297, and MW303 located near the fuel tank farms on Bombing Road were observed to emit a hydrocarbon odour. No measurable LNAPL was observed. LNAPL globules and sheen were recorded at MW297.
Depth to groundwater	Depth to groundwater was recorded from 29 of 30 wells visited, ranging from 0.885 (MW209) to 6.555 (MW144) metres below top of casing (mbtoc). Groundwater elevations in the aquifer were between 4.63 (MW185) and 29.09 (MW115) metres Australian Height Datum (mAHD). Groundwater gauging data is presented in Appendix B – Table 2a.

Item	Observations and field measurements
Inferred groundwater flow	Inferred groundwater contours and groundwater flow directions at the Site in March 2022 are shown on Appendix A – Figure 4. A localised high point is located in the centre of the Base, south of the runway, with the groundwater flow radiating from this location. Groundwater in the north and west portions of the Base is inferred to generally flow north west towards the coast, with localised flow towards Ludmilla Creek on the western boundary of the Base and Rapid Creek north of the Base. Groundwater to the south of the site is inferred to flow towards Charles Darwin National Park and Francis Bay. Groundwater contours are generally consistent with the Detailed Site Investigation (Department of Defence, 2018) flow direction.
Geochemical parameters	Groundwater geochemical parameters were measured after sample collection from the Hydrasleeve™ using a sterilised YSI cup and YSI Pro Water Quality Meter. The readings are presented in Appendix B – Table 2a, and YSI calibration certificate in **Appendix G**) and are summarised below: • DO ranged from 1.44 mg/L (MW133) to 5.20 mg/L (MW180). • EC ranged from 37.8 µS/cm (MW156) to 55,572.0 µS/cm (MW201). The majority of readings were below 100 µS/cm indicating generally low salinity, with higher salinity generally at lower groundwater elevations around the perimeter of the monitoring network. • pH ranged from 4.05 (MW115) to 6.40 (MW303) indicating acidic to slightly acidic conditions. • ORP (corrected) ranged from 224.9 mV (MW303) to 379.4 mV (MW201) indicating reducing conditions.

4.3.2 PFAS groundwater analytical results

During this sampling event, 33 of the 34 groundwater locations sampled reported concentrations of PFAS above the laboratory limits of reporting (LOR).

The March sampling event reported no first-time exceedances for PFAS concentrations against the criteria, with the exception of MW422 exceeding the *PFAS Recreational Water-Use* (HEPA, 2020) criteria for human health receptors. MW422 has historically exceeded the *PFAS Drinking Water* (HEPA, 2020) criteria for human health.

New maximum concentrations were reported for on-Base locations MW103, MW201 and MW205 for PFHxS+PFOS and PFOS in November 2021 and at MW422 for PFHxS+PFOS, PFOS, PFHxS and PFOA in March 2022.

A new maximum concentration was reported at off-Base location MW176 for PFOS in November 2021.

The PFAS groundwater analytical results from the March 2022 sampling event are presented in Appendix B – Table 2b.

Table 19 First time detections of PFAS and exceedances of guidelines in groundwater (March)

Type	Location ID	Sum of PFHxS + PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFOS concentration (µg/L)	
		March 2022	Historical maximum	March 2022	Historical maximum	March 2022	Historical maximum
First time detections of Sum of PFHxS+PFOS, PFOS or PFOA in groundwater.	There were no first-time detections of PFHxS+PFOS, PFOS or PFOA during this sampling event.						
First time exceedance of human health	MW422	328	81.6	12.5	2.01	93.3	51.6

criteria for sum of PFHxS+PFOS or PFOA in groundwater.							
First time exceedance of ecological criteria for PFOS or PFOA in groundwater	There were no first-time detections of PFHxS+PFOS, PFOS or PFOA during this sampling event.						

4.4 Surface water – January event

4.4.1 Field observations and field measurements

Table 20 Surface water observations and field measurements

Item	Observations and field measurements
Fieldwork dates	The surface water samples and field parameters were subsequentially collected between 13 and 17 January 2022.
Access and sample collection	All surface water locations were accessible and able to be sampled.
Field observations	Rapid creek system generally had high flows with low turbidity. RAAF Base Darwin drainage areas varied with pooled water to moderate flow from recent precipitation with low to moderate turbidity. DIA drainage systems had moderate flow and low turbidity. All other peripheral sampling locations being coastal, presented out going tides with moderate flow and relatively high salinity.
Rainfall	127mm of rainfall was reported for the Darwin Area (Darwin Airport weather station, 014015) during the month until the 13 January 2022 (Bureau of Meteorology, 2021). 33.6mm rainfall was recorded during the sampling event.
Surface water flow	General surface water flow was moderate to strong in the Rapid Creek system. Other drainage lines presented low to moderate flows.
Water quality measurements	Surface water quality measurements were measured after the collection of surface water samples in January 2022. The stabilised readings are presented in Appendix B – Table 3a, and are summarised below: Dissolved oxygen ranged from 2.34 mg/L (SW114) to 4.50 mg/L (SW160). Electrical conductivity ranged from 42.0 µS/cm (SW160) to 24,913.0 µS/cm (SW124). pH ranged from 5.61 (SW168) to 8.25 (SW115) indicating a range from mildly acidic to mildly basic conditions. Redox (corrected) ranged from 255.5 mV (SW132) to 406.5 mV (SW168) indicating oxidising conditions.

4.4.2 PFAS surface water analytical results

During this sampling event, 22 of 22 surface water samples reported concentrations of PFAS above the laboratory LOR with one location (SW178) reporting a first-time exceedance of human health criteria for the Sum PFHxS + PFOS in drinking water (0.07 µg/L) presented in Table 21 below.

New maximum detections for PFHxS+PFOS were reported at on-Base location SW178 and off-Base locations SW113 and SW124 in January 2022.

The PFAS surface water analytical results from the January 2022 sampling event are presented in Appendix B – Table 3b.

Table 21 First time detection of PFAS and exceedances of guidelines in surface water (January)

Type	Location ID	Sum of PFHxS + PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFOS concentration (µg/L)	
		January 2022	Historical maximum	January 2022	Historical maximum	January 2022	Historical maximum
First time detections of Sum of PFHxS+PFOS, PFOS or PFOA in surface water.	There were no first-time detections of PFHxS+PFOS, PFOS or PFOA during this sampling event.						
First time exceedance of human health criteria for sum of PFHxS+PFOS or PFOA in surface water.	SW178	0.38	0.04	<LOR	<LOR	0.34	0.04
First time exceedance of ecological criteria for PFOS or PFOA in surface water	There were no first-time exceedances of ecological criteria for PFOS or PFOA in surface water during this sampling event						

4.5 Surface water – March event

4.5.1 Field observations and field measurements

Table 22 Surface water observations and field measurements

Item	Observations and field measurements
Fieldwork dates	The surface water samples and field parameters were subsequentially collected from 14 to 16 March 2022.
Access and sample collection	All surface water locations were accessible and able to be sampled with the exception of the following: • Location SW104 was not sampled as it could not be accessed due to dense and hazardous vegetation. • Location SW156 was dry. • Location SW160 was dry.
Field observations	Rapid Creek system generally had high flows with low turbidity. RAAF Base Darwin drainage culverts varied with pooled water from recent precipitation with low to moderate turbidity. DIA drainage systems had low to no flow and low turbidity with sheen present at SW115. SW125 had low flowing water with low turbidity. All other peripheral sampling locations presented low salinity and low lows not being influenced by tides. Tidal influenced sites presented with relatively high salinity.
Rainfall	6.6mm of rainfall was reported for the Darwin Area (Darwin Airport weather station, 014015) during the month until 13 March 2022 (Bureau of Meteorology, 2021). 52.8mm rainfall was recorded during the sampling event.
Surface water flow	General surface water flow was moderate to strong in the Rapid creek system. Other drainage lines presented generally with no to low flows.

Item	Observations and field measurements
Water quality measurements	Surface water quality measurements were measured after collecting surface water samples in March 2022. The stabilised readings are presented in Appendix B – Table 4a and are summarised below: • Dissolved oxygen ranged from 2.00 mg/L (SW153) to 4.34 mg/L (OTH008). • Electrical conductivity ranged from 564 µS/cm (SW108) to 1962 µS/cm (OTH008). • pH ranged from 7.05 (OTH008) to 7.34 (SW108) indicating relatively neutral conditions. • Redox (corrected) ranged from 313.8 mV (SW108) to 722.1 mV (OTH008) indicating oxidising conditions.

4.5.2 PFAS surface water analytical results

During this sampling event, 18 of 19 surface water locations sampled reported concentrations of PFAS above the laboratory limits of reporting (LOR).

There were no first-time detections or exceedances of the adopted criteria at any of the sampled surface water monitoring locations.

The PFAS surface water analytical results from the March 2022 sampling event are presented in Appendix B – Table 4b.

5.0 Summary and next sampling events

5.1 Summary of monitoring event

The annual and bi-annual monitoring events were completed at the Site and publicly accessible land within the Management Area for annual biota sampling from 9 November to 3 December 2021, biannual groundwater sampling from 8 to 10 March 2022, and first flush surface water sampling from 13 to 17 January and from 14 to 16 March 2022 for late wet season surface water sampling.

The program included the following:

- Annual sampling of biota from Rapid and Ludmilla Creeks for biota species along with paired surface waters. Biota sampling was conducted in November 2021, however, sample preparation and analysis were delayed due to COVID restrictions. The biota results were reported in March 2022 and are therefore included in this report.
- Biannual groundwater sampling in March from 30 of 31 planned monitoring wells. Monitoring well MW215 was inaccessible due to construction activities and contingency location MW121 was unable to be located. Contingency location MW201 was sampled in lieu of MW148 which was found to be damaged.
- Twice in wet season surface water sampling for the ‘first-flush’ event in January 2022 from all 22 planned locations.
- Twice in wet season surface water sampling at 19 of planned 22 locations for the mid- to late-wet season event in March 2022. Location SW156 and SW160 presented as dry, and SW104 was overgrown with hazardous vegetation.
- Biannual groundwater gauging and sampling from four of planned four monitoring wells for the Base-wide Mass Flux PFAS Investigation.
- Monthly in wet season collection of surface water samples from two of planned three locations for the Base-wide Mass Flux PFAS Investigation on the 2 March and 14 March 2022. Location SW300 was dry both rounds.

The findings of the annual biota sampling event and the recommended actions are summarised in Table 23 below.

Table 23 Summary of annual biota sampling event in November 2021, processed in March 2022.

Item	Comment	Recommended actions
Access to sampling locations	All proposed monitoring locations were accessible.	No actions recommended.
Analytical Results	PFAS concentrations were recorded above the LOR at 6 of 6 biota locations.	No actions recommended.
First time exceedance of adopted criteria	No locations reported first time detections.	Ongoing monitoring in accordance with the OMP.
First time detection of PFAS in biota	No locations reported first time detections.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show an increasing trend in biota	This will be evaluated in the annual interpretive report.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show a decreasing trend in biota	This will be evaluated in the annual interpretive report.	No actions recommended.

The findings of the biannual groundwater sampling event and the recommended actions are summarised in Table 24 below.

Table 24 Summary of March biannual groundwater sampling event

Item	Comment	Recommended actions
Access to sampling locations	All proposed monitoring locations were accessible with exception to MW215, which was located within a restricted construction area. Contingency well MW121 was unable to be located and thus not sampled.	Prior arrangements to be made with construction company to access site if necessary, in future visits. Confirm status of contingency well MW121 whether accessible or lost prior to next GME in order to inform an SAQP update.
Monitoring well network condition	Monitoring well MW148 was unable to be sampled due to damage to the standpipe and casing. Given that sufficient coverage will be provided by monitoring wells MW201 (contingency location) it is not anticipated that this will affect the continued implementation of the OMP.	Arrangements have been made to inspect the well to determine if it can be repaired or if it needs replacing.
Analytical Results	PFAS concentrations were recorded above the LOR at 29 of 30 groundwater monitoring wells sampled.	No actions recommended.
First time exceedance of PFAS NEMP 2.0 drinking water guideline values in groundwater	No locations reported first time detections or exceedance of the	Ongoing monitoring in accordance with the OMP.

Item	Comment	Recommended actions
	PFAS NEMP 2.0 drinking water guideline values. A first-time exceedance of the PFAS NEMP 2.0 recreational water guideline was reported at MW422 in March 2022.	
First time detection of PFAS in groundwater	No locations reported first time detections.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show an increasing trend in groundwater.	This will be evaluated in the annual interpretive report.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show a decreasing trend in groundwater.	This will be evaluated in the annual interpretive report.	No actions recommended.

The findings of the twice in wet season surface water sampling January 2022 event and the recommended actions are summarised in Table 25 below.

Table 25 Summary of January twice in wet season surface water sampling event

Item	Comment	Recommended actions
Access to sampling locations	All proposed monitoring locations were accessible.	No actions recommended.
Analytical Results	PFAS concentrations were recorded above the LOR at all 22 surface water monitoring locations.	No actions recommended.
First time exceedance of PFAS NEMP 2.0 drinking water or recreational guideline values in surface water	No locations reported first time exceedance of the PFAS NEMP 2.0 drinking water or recreational guideline values with the exception of SW178 at 0.38 µg/L.	Downgradient sampling locations did not have PFAS concentrations above historical results suggesting that the elevated concentration at SW178 has an immaterial impact on the overall site conditions. Ongoing monitoring in accordance with the OMP.
First time detection of PFAS in surface water	No locations reported first time detections.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show an increasing trend in surface water.	This will be evaluated in the annual interpretive report.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show a decreasing trend in surface water.	This will be evaluated in the annual interpretive report.	No actions recommended.

The findings of the twice in wet season surface water sampling March 2022 event and the recommended actions are summarised in Table 26 below.

Table 26 Summary of the March twice in wet season surface water sampling event

Item	Comment	Recommended actions
Access to sampling locations	All proposed monitoring locations were accessible with exception of the following locations: • SW104 (Hazardous vegetation) • SW156 and SW160 (dry)	Discuss with DIA clearing new path to surface water location for SW104. Whereas attempt to collect samples during high precipitation event for SW156 and SW160.
Analytical Results	PFAS concentrations were recorded above the LOR at 18 of the 19 sampled surface water monitoring locations.	No actions recommended.
First time exceedance of PFAS NEMP 2.0 drinking water guideline values in surface water	No locations reported first time detections.	Ongoing monitoring in accordance with the OMP.
First time detection of PFAS in surface water	No locations reported first time detections.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show an increasing trend in surface water	This will be evaluated in the annual interpretive report.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show a decreasing trend in surface water	This will be evaluated in the annual interpretive report.	No actions recommended.

The findings of the biannual PFAS Mass Flux groundwater sampling March 2022 event and the recommended actions are summarised in Table 27 below.

Table 27 Summary of biannual PFAS Mass Flux groundwater sampling event in March 2022.

Item	Comment	Recommended actions
Access to sampling locations	All proposed monitoring locations were accessible and sampled.	No actions recommended.
Analytical Results	PFAS concentrations were recorded above the LOR at four of four sampled surface water monitoring locations.	No actions recommended.
First time exceedance of PFAS NEMP 2.0 drinking water guideline values in groundwater	No locations reported first time detections.	Ongoing monitoring in accordance with the OMP.
First time detection of PFAS in groundwater	No locations reported first time detections.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show an increasing trend in groundwater	This will be evaluated in the annual interpretive report.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show a decreasing trend in groundwater	This will be evaluated in the annual interpretive report.	No actions recommended.

The findings of the monthly wet season surface water sampling for PFAS Mass Flux in March 2022 event and the recommended actions are summarised in Table 28 below.

Table 28 Summary of the monthly wet season PFAS Mass Flux surface water sampling event in March 2022.

Item	Comment	Recommended actions
Access to sampling locations	All proposed monitoring locations were accessible and sampled with the exception of SW300 in both rounds.	Attempt to collect samples during high precipitation event for SW300.
Analytical Results	PFAS concentrations were recorded above the LOR at two of two sampled surface water monitoring locations.	No actions recommended.
First time exceedance of PFAS NEMP 2.0 drinking water guideline values in surface water	No locations reported first time detections.	Ongoing monitoring in accordance with the OMP.
First time detection of PFAS in surface water	No locations reported first time detections.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show an increasing trend in surface water	This will be evaluated in the annual interpretive report.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show a decreasing trend in surface water	This will be evaluated in the annual interpretive report.	No actions recommended.

5.2 Upcoming sampling events

The next sampling event scheduled is the monthly in wet season surface water sampling event in April 2022.

5.3 Upcoming annual interpretive report

The next annual interpretive report is scheduled to be delivered in July 2022.

6.0 References

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Appendix A

Figures

Appendix A Figures

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.5 1 2

Kilometres

1:45,000 (when printed at A3)

Legend

- Drainage
- Highway
- Management Area
- RAAF Base Darwin
- Source Area

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 Esri

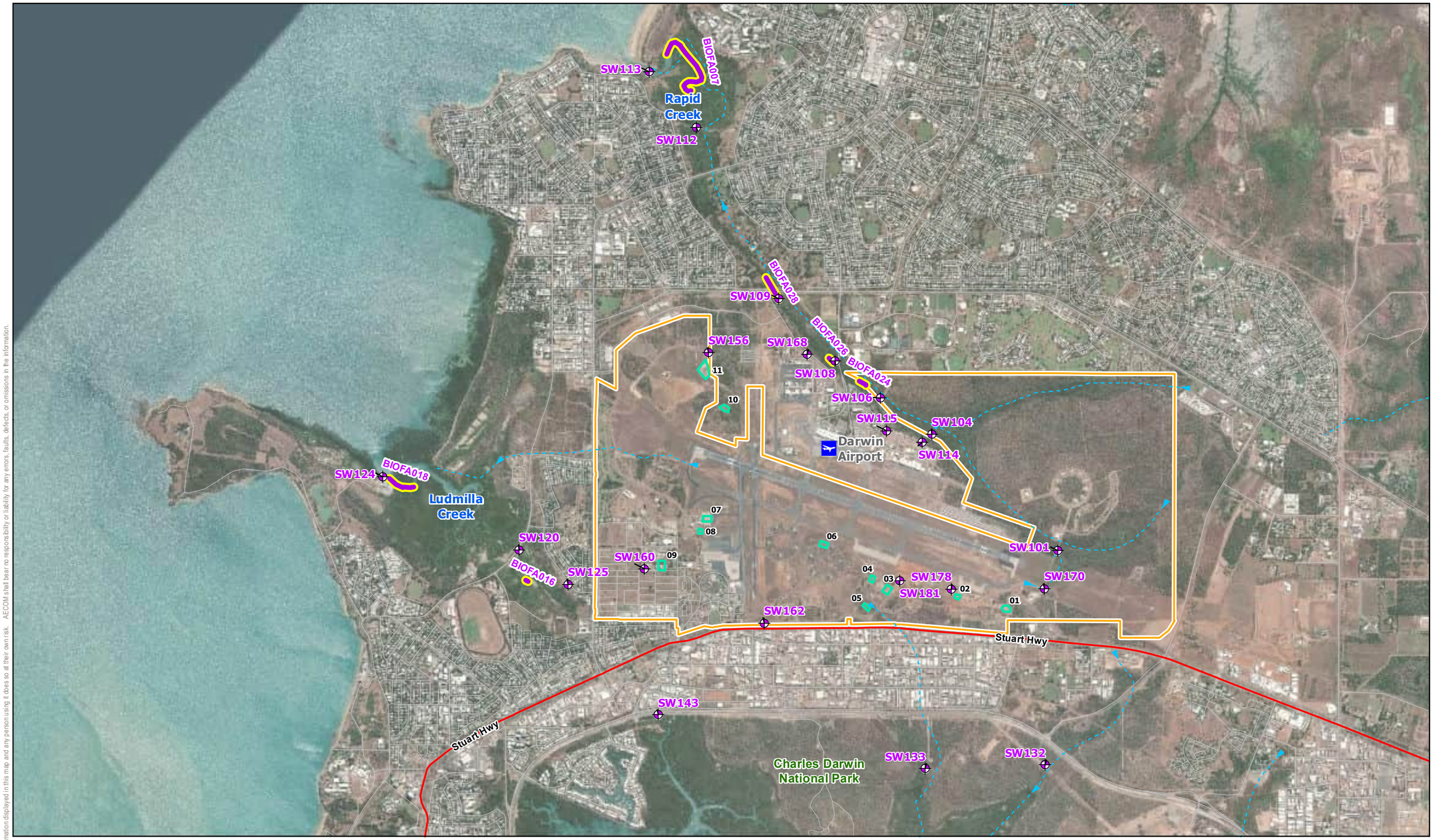
Department of Defence
RAAF BASE DARWIN
PFAS OMP
FACTUAL REPORT
November 2021 - March 2022
Site and Management Area

PROJECT ID 60612561
CREATED BY [redacted]
LAST MODIFIED [redacted]
VERSION: 1

Figure 01

Filename: \[redacted]

A3 size



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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.25 0.5 1 1.5

Kilometers

1:35,000 (when printed at A3)

Legend

- Surface Water Locations
- Biota Sampling Location
- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
RAAF BASE DARWIN
FACTUAL REPORT 2020/21

Surface Water and Biota Locations

PROJECT ID 60612561
CREATED BY [redacted]
LAST MODIFIED [redacted]
VERSION: 1

Figure 02

Filename: [redacted]

A3 size

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000
Metres

1:20,000 (when printed at A3)

Legend

- Groundwater Monitoring Location
- Not sampled - damaged casing or inaccessible
- Drainage
- RAAF Base Darwin
- Source Area
- Highway
- Road

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
RAAF BASE DARWIN
PFAS OMP
FACTUAL REPORT
November 2021 - March 2022
Groundwater Sampling Locations

[redacted]

Figure
03

Filename: [redacted]

A3 size

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 250 500 1,000
Metres

1:20,000 (when printed at A3)

Legend

- Groundwater Monitoring Location
- Not sampled - damaged casing or innaccessible
- Inferred Groundwater Level
- Inferred Groundwater Direction
- Drainage
- RAAF Base Darwin
- Source

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) NTLIS

Department of Defence
RAAF BASE DARWIN
PFAS OMP
FACTUAL REPORT
March 2022
Inferred Groundwater Contours

PROJECT ID 60612561
CREATED BY [redacted]
LAST MODIFIED [redacted]
VERSION: 1

Figure 04

Filename: [redacted]

A3 size

Appendix B

Tables

Appendix B Tables

Table T1
Biota PFAS Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Base Darwin

AECOM

										PFAS Full Suite																											
										10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	Perfluorobutane sulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanesulfonic acid (PFDS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (FOSA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	PFOS - Branched	PFOS - Linear	Sum of PFAS	Sum of PFOS and PFHxS	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorohexane sulfonic acid (PFHxS)
										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	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	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.005	0.001	0.002	0.001	0.005	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.005	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
FSANZ 2017 2-6 years Crustaceans (invertebrate)																																**0.065**	**0.065**	**0.52**	**0.065**
FSANZ 2017 2-6 years Finfish (fish)																																**0.0052**	**0.0052**	**0.041**	**0.0052**
Location	**Field ID**	**Sampled Date**	**Fauna Group**	**Species**	**No. of Specimen**	**Length Range (mm)**	**Total Weight (g)**	**Dissected Sample Weight (g)**	**Sample Portion**																												
BIOFA007	1302_BIOAFA218_211125	25/11/2021	Fish	Barramundi (Lates calcarifer)	1	450	750	110	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA219_211125	25/11/2021	Fish	Barramundi (Lates calcarifer)	1	400	700	100	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA220_211125	25/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	400	920	60	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA221_211125	25/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	400	655	35	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA222_211125	25/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	370	600	40	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	<0.001	0.002	0.002	0.001	<0.001	0.001
	1302_BIOAFA223_211125	25/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	380	635	35	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.003	0.003	0.002	<0.001	0.001
	1302_BIOAFA224_211125	25/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	340	545	30	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.004	0.004	0.002	<0.001	<0.001	0.002
	1302_BIOAFA225_211125	25/11/2021	Fish	Sicklefish (Drepane punctata)	1	250	425	50	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA226_211125	25/11/2021	Fish	Pomfish (Leiognathus equulus)	1	200	125	85	Whole minus organs	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.004	0.005	0.005	0.005	<0.001	<0.001
	1302_BIOAFA227_211125	25/11/2021	Fish	Scat (Scatophagus sp.)	1	190	225	110	Whole minus organs	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.007	0.009	**0.009**	**0.009**	<0.001	<0.001
	1302_BIOAFA228_211125	25/11/2021	Fish	Scat (Scatophagus sp.)	1	180	195	85	Whole minus organs	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.006	0.008	**0.008**	**0.008**	<0.001	<0.001
	1302_BIOAFA229_211125	25/11/2021	Fish	Scat (Scatophagus sp.)	1	180	170	85	Whole minus organs	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	0.004	0.004	0.004	0.004	<0.001	<0.001
	1302_BIOAFA230_211203	3/12/2021	Fish	Sea Mullet (Mugil cephalus)	2	180	85	50	Whole minus organs	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA231_211203	3/12/2021	Fish	Sea Mullet (Mugil cephalus)	3	155	75	45	Whole minus organs	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.003	0.004	0.004	0.004	<0.001	<0.001
	1302_BIOAFA232_211203	3/12/2021	Fish	Sea Mullet (Mugil cephalus)	1	140	80	50	Whole minus organs	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	0.002	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA233_211203	3/12/2021	Fish	Garfish (Hemiramphidae (familv))	1	190	30	25	Whole minus organs	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA234_211203	3/12/2021	Fish	Northern Whiting (Sillago sihama)	1	180	45	30	Whole minus organs	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA235_211203	3/12/2021	Fish	Northern Whiting (Sillago sihama)	1	180	45	30	Whole minus organs	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA236_211203	3/12/2021	Fish	Northern Whiting (Sillago sihama)	3	160	80	50	Whole minus organs	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
BIOFA016	1302_BIOAFA204_211108	8/11/2021	Invertebrate	Long Burn (Telescopium telescopium)	10	70-80	435	70	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.006	0.011	0.007	0.004	<0.001	<0.001
	1302_BIOAFA205_211108	8/11/2021	Invertebrate	Long Burn (Telescopium telescopium)	10	70-80	440	70	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.007	0.011	0.008	0.003	<0.001	<0.001
	1302_BIOAFA206_211108	8/11/2021	Invertebrate	Long Burn (Telescopium telescopium)	10	80-90	510	85	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.007	0.011	0.008	0.003	<0.001	<0.001
	1302_BIOAFA207_211108	8/11/2021	Invertebrate	Giant Mangrove Whelk (Terebralia palustris)	10	90-110	555	105	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.01	0.012	0.012	0.012	<0.001	<0.001
	1302_BIOAFA208_211108	8/11/2021	Invertebrate	Giant Mangrove Whelk (Terebralia palustris)	10	80-100	505	95	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.006	0.007	0.007	0.007	<0.001	<0.001
BIOFA018	1302_BIOAFA237_211124	24/11/2021	Fish	Barramundi (Lates calcarifer)	1	510	1560	150	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA238_211124	24/11/2021	Fish	Barramundi (Lates calcarifer)	1	470	1280	110	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA239_211124	24/11/2021	Fish	Barramundi (Lates calcarifer)	1	410	780	65	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA240_211124	24/11/2021	Fish	Barramundi (Lates calcarifer)	1	460	780	85	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.006	0.01	**0.01**	**0.007**	<0.001	0.003
	1302_BIOAFA241_211124	24/11/2021	Fish	Brown Sweetlips (Plectorhinchus gibbosus)	1	450	2420	90	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA242_211124	24/11/2021	Fish	Brown Sweetlips (Plectorhinchus gibbosus)	1	480	2525	110	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA243_211124	24/11/2021	Fish	Brown Sweetlips (Plectorhinchus gibbosus)	1	410	1520	90	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	<0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA244_211124	24/11/2021	Fish	King Salmon (Polydactylus macrochir)	1	570	1415	105	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA245_211124	24/11/2021	Fish	King Salmon (Polydactylus macrochir)	1	500	1110	90	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA246_211124	24/11/2021	Fish	King Salmon (Polydactylus macrochir)	1	470	880	100	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA247_211124	24/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	330	480	55	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.006	0.033	0.048	**0.048**	0.039	<0.001	0.009
	1302_BIOAFA248_211124	24/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	340	490	75	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.003	0.009	0.009	0.004	<0.001	0.005
	1302_BIOAFA249_211124	24/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	1	350	455	75	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.03	0.031	**0.031**	0.031	<0.001	<0.001
	1302_BIOAFA250_211124	24/11/2021	Fish	Archerfish (Toxotes chatareus)	1	270	460	50	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA251_211124	24/11/2021	Fish	Archerfish (Toxotes chatareus)	1	260	335	40	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA252_211124	24/11/2021	Fish	Archerfish (Toxotes chatareus)	1	250	340	60	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA253_211124	24/11/2021	Fish	Scat (Scatophagus sp.)	1	220	350	175	Whole minus organs	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.009	0.009	0.009	**0.009**	**0.009**	<0.001	<0.001
	1302_BIOAFA254_211124	24/11/2021	Fish	Scat (Scatophagus sp.)	1	200	250	125	Whole minus organs	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA255_211124	24/11/2021	Fish	Scat (Scatophagus sp.)	1	180	195	90	Whole minus organs	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA256_211124	24/11/2021	Fish	Barred Javelin (Pomadasys kaakan)	1	280	370	90	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA257_211124	24/11/2021	Fish	Bull Shark (Carcharhinus leucas)	1	590	3005	85	Flesh	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.001	0.001	0.001	<0.001	<0.001
BIOFA024	1302_BIOAFA215_211112	12/11/2021	Invertebrate	Redclaw Crayfish (Cherux quadricarinatus)	3	35-40	45	45	Whole	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	**0.002**	<0.002	<0.001	0.006	0.037	0.06	0.058	0.043	<0.001	0.015
	1302_BIOAFA216_211112	12/11/2021	Crustaecean	Redclaw Crayfish (Cherux quadricarinatus)	3	40-50	65	65	Whole	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.002	<0.002	<0.001	0.006	0.024	0.04	0.038	0.03	<0.001	0.008
	1302_BIOAFA217_211112	12/11/2021	Crustaecean	Redclaw Crayfish (Cherux quadricarinatus)	2	50-60	95	95	Whole	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.009	0.016	0.016	0.011	<0.001	0.005
BIOFA026	1302_BIOAFA212_211114	14/11/2021	Crustaecean	Redclaw Crayfish (Cherux quadricarinatus)	4	40-50	95	95	Whole	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	**0.001**	<0.001	<0.001	<0.001	<0.005	**0.002**	<0.002	<0.002	<0.002	<0.001	0.004	0.017	0.037	0.034	0.021	<0.001	0.013
	1302_BIOAFA213_211114	14/11/2021	Crustaecean	Redclaw Crayfish (Cherux quadricarinatus)	2	50	95	95	Whole	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	**0.001**	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.018	0.034	0.032	0.022	<0.001	0.01
	1302_BIOAFA214_211114	14/11/2021	Crustaecean	Redclaw Crayfish (Cherux quadricarinatus)	2	60-70	125	125	Whole	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	**0.001**	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.018	0.031	0.03	0.022	<0.001	0.008
BIOFA028	1302_BIOAFA209_211113	13/11/2021	Crustaecean	Redclaw Crayfish (Cherux quadricarinatus)	5	35-50	120	120	Whole	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	**0.002**	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	**0.002**	<0.001	<0.005	**0.002**	<0.002	<0.002	<0.002	<0.001	0.004	0.018	0.044	0.038	0.022	<0.001	0.016
	1302_BIOAFA210_211113	13/11/2021	Crustaecean	Redclaw Crayfish (Cherux quadricarinatus)	3	60-65	215	215	Whole	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	**0.004**	<0.001	<0.001	<0.001	<0.001	<0.005	**0.001**	<0.002	**0.003**	**0.002**	<0.001	0.01	0.037	0.075	**0.065**	0.047	<0.001	0.018
	1302_BIOAFA211_211113	13/11/2021	Crustaecean	Redclaw Crayfish (Cherux quadricarinatus)	2	70-75	190	190	Whole	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	**0.002**	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	**0.002**	<0.001	<0.005	**0.002**	<0.002

Table 2a
Groundwater Field and Gauging Results
PFAS Ongoing Monitoring Program
Department of Defence- RAAF Darwin

AECOM

Location ID	Screening Interval (m btoc)	Hydrasleeve Deployment Collar Depth (mbtoc)	Sampled Date	Depth to Water (mbtoc)	Well Depth (mbtoc)	Water Elevation (mAHD)	TOC (mAHD)	Well Condition	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Redox (mV)	Redox (corr) (mV)	Temp (°C)	Water Colour	Odour	Sample Method/Comments
MW103	1-15	6.0	3/03/2022	2.483	12.23	17.07	19.55	Good	1.69	96.8	63	4.68	113.9	314.9	32.2	Brown | Clear	No odour	Hydrasleeve
MW107	1-15	7.0	3/03/2022	2.693	14.94	19.25	21.94	Good	2.16	107.1	70	5.30	137.8	340.2	30.4	Orange | Clear orange	Slight Organic Odour	Hydrasleeve
MW112	1-15	8.0	7/03/2022	2.839	13.84	24.13	26.97	Good	4.65	57.9	38	4.46	97.7	298.7	32.2	Clear	No odour	Hydrasleeve
MW115	1-15	9.0	7/03/2022	3.318	15.70	29.09	32.41	Good	3.92	57.5	37	4.05	157.1	358.3	31.9	Orange / brown	Slight Organic Odour	Hydrasleeve
MW128	1-15	8.0	3/03/2022	1.795	14.66	9.60	11.39	Good	2.06	145.1	94	4.39	135.5	336.7	31.9	Orange / brown	No odour	Hydrasleeve
MW133	1-15	9.0	4/03/2022	4.482	14.88	25.73	30.21	Good	1.44	61.2	40	5.10	132.5	333.5	32.2	Clear orange	HC odour	Hydrasleeve
MW139	1-15	8.0	4/03/2022	2.227	14.44	26.32	28.55	Good	1.94	46.2	30	4.95	159.3	361.2	31.0	Clear / dark brown	No odour	Hydrasleeve
MW141	1-15	9.0	4/03/2022	4.194	15.95	25.91	30.10	Good	1.75	58.6	38	4.75	152.9	354.8	31.0	Clear	No odour	Hydrasleeve
MW144	1-15	10.0	4/03/2022	6.555	15.76	24.14	30.69	Good	4.42	42.6	28	4.65	148.6	350.3	31.3	Clear	No odour	Hydrasleeve
MW148	-	-	-	-	-	-	-	Bent	-	-	-	-	-	-	-	-	-	Unable to sample; Bent PVC Casing
MW156	1-12	6.5	7/03/2022	1.582	11.97	21.46	23.04	Good	3.49	37.8	25	4.28	160.7	363.2	30.2	Orange / clear	No odour	Hydrasleeve
MW176	1-12	6.0	2/03/2022	2.649	11.70	16.09	18.74	Good	2.60	148.8	97	5.80	111	313.1	30.8	Orange / brown / cear	No odour	Hydrasleeve
MW180	1-15	9.0	2/03/2022	3.822	15.20	25.24	29.06	Good	5.20	65.1	42	4.82	134.6	334.9	33.2	Light brown / clear	No odour	Hydrasleeve
MW185	1-12	5.0	2/03/2022	1.188	10.60	4.63	5.82	Good	1.65	582.0	378	5.06	156.6	357.8	32.0	Clear	No odour	Hydrasleeve
MW190	1-12	7.0	7/03/2022	1.474	12.40	9.87	11.34	Good	1.87	55.6	36	5.10	154.5	355.3	32.5	Orange	Slight Organic Odour	Hydrasleeve
MW191	1-12	6.0	7/03/2022	2.760	12.76	8.15	10.91	Good	2.25	64.6	42	5.08	159.1	359.9	32.5	Orange / light brown / clear	No odour	Hydrasleeve
MW194	1-12	5.0	3/03/2022	1.319	12.44	16.92	18.24	Good	1.65	42.9	28	4.77	157.4	359.0	31.4	Clear	Slight Organic Odour	Hydrasleeve
MW195	1-12	6.0	3/03/2022	1.157	11.28	15.58	16.74	Good	1.78	62.8	41	5.00	149.3	351.0	31.3	Light orange / white / brown	No odour	Hydrasleeve
MW197	1-15	6.5	3/03/2022	3.826	15.78	22.37	26.20	Good	1.50	66.1	43	5.42	34.2	237.1	29.6	Clear	Slight Organic Odour	Hydrasleeve
MW200	1-12	8.0	2/03/2022	4.124	12.73	22.11	26.23	Good	2.07	61.5	40	4.66	129.1	331.1	30.9	Light brown / clear	No odour	Hydrasleeve
MW201	1-12	5.0	3/03/2022	2.175	8.07	3.75	5.92	Good	2.71	55572.0	36122	5.31	177.8	379.4	31.4	Orange / clear	No odour	Hydrasleeve
MW205	1-15	8.0	7/03/2022	2.880	14.96	24.87	27.75	Good	2.56	38.5	25	4.51	114.1	315.6	31.6	Light orange / brown / clear	Slight Organic Odour	Hydrasleeve
MW209	1-10	6.0	3/03/2022	0.885	11.33	6.05	6.94	Good	2.38	1450.0	943	5.25	156.6	357.6	32.2	Orange / clear	No odour	Hydrasleeve
MW210	1-10	7.0	3/03/2022	1.894	11.43	5.02	6.91	Good	2.00	110.7	72	5.90	140.3	340.7	33.0	Orange and brown / clear	Strong organic odour	Hydrasleeve
MW211	1.5-15	7.0	2/03/2022	3.875	14.95	18.65	22.52	Good	2.20	266.3	173	5.35	132.5	334.3	31.2	Light grey / brown / clear	No odour	Hydrasleeve
MW240	1-15	8.0	3/03/2022	2.287	14.45	23.31	25.60	Good	2.35	53.6	35	5.24	94.20	296.2	30.9	Clear / slight orange	No odour	Hydrasleeve
MW241	1-15	8.0	3/03/2022	1.864	14.47	23.15	25.01	Good	3.39	51.5	33	4.80	150.10	352.3	30.6	Clear / brown / orange	Slight Organic Odour	Hydrasleeve
MW297	1-15	9.0	4/03/2022	4.118	15.22	25.41	29.53	Good	2.70	45.1	29	4.73	174.1	376.4	30.5	Clear	HC odour	Hydrasleeve
MW303	1-15	10.5	4/03/2022	6.149	15.50	25.79	31.94	Good	2.37	295.2	192	6.40	24	224.9	32.4	Clear	HC odour	Hydrasleeve
MW422	1-15	8.0	4/03/2022	1.710	14.81	26.06	27.77	Good	1.71	57.6	37	5.20	146.8	347.4	32.7	Clear / brown / orange	No odour	Hydrasleeve

Notes:
mbtoc: meters below top of casing
mAHD: meters Australian Height Datum
mbgl: meters below ground level
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
oC: degrees celcius
NA: not available

Table 2b
Groundwater Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

AECOM

		PFAS Full Suite																													
		10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTeDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
		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
LOR		**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.02**	**0.05**	**0.05**	**0.02**	**0.05**	**0.02**	**0.1**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.02**	**0.05**	**0.02**	**0.02**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
Ecological Receptors	PFAS NEMP 2020 Freshwater 99%																												0.00023	19	
Human Health Receptors	PFAS NEMP 2020 Drinking Water																											0.07		0.56	
	PFAS NEMP 2020 Recreational Water																											2		10	

Location ID	Field ID	Date	Sample Type																													
MW103	1302_MW103_220307	7/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.25	<0.1	<0.02	<0.02	<0.02	0.29	0.09	0.95	<0.02	<0.02	0.35	0.15	<0.05	<0.02	<0.02	24.3	**21.9**	**17.3**	0.28	4.64
MW107	1302_MW107_220309	9/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	<0.1	<0.02	<0.02	<0.02	0.2	0.07	0.79	<0.02	<0.02	0.33	0.16	<0.05	<0.02	<0.02	10.4	**8.46**	**5.4**	0.16	3.06
MW112	1302_MW112_220310	10/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.32	<0.1	<0.02	<0.02	<0.02	0.16	0.06	0.9	<0.02	<0.02	0.3	0.14	<0.05	<0.02	<0.02	11.2	**9.14**	**6.88**	0.16	2.26
MW115	1302_MW115_220310	10/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.48	0.6	0.12	<0.02	<0.02	2.33	0.66	6.92	<0.02	0.23	3.21	1.03	<0.05	<0.02	<0.02	106	**85.2**	**59.3**	**1.76**	25.9
MW128	1302_MW128_220307	7/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	<0.1	<0.02	<0.02	<0.02	0.1	0.04	0.4	<0.02	<0.02	0.17	0.08	<0.05	<0.02	<0.02	6.63	**5.59**	**4**	0.1	1.59
	1302_QC100_220307	7/03/2022	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.1	0.04	0.4	<0.02	<0.02	0.17	0.09	<0.05	<0.02	<0.02	6.72	**5.66**	**4.09**	0.1	1.57
	1302_QC200_220307	7/03/2022	Interlab Duplicate	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.14	0.052	<0.01	<0.01	<0.01	0.088	0.045	0.31	<0.01	<0.01	0.14	0.082	<0.02	<0.02	<0.01	4.63	**3.68**	**2.7**	0.09	0.98
MW133	1302_MW133_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.5	0.1	0.05	<0.02	<0.02	0.7	0.2	2.35	<0.02	0.06	0.66	0.32	<0.05	<0.02	<0.02	42.2	**36.7**	**30.4**	0.53	6.32
MW139	1302_MW139_220309	9/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.44	**0.41**	**0.27**	<0.01	0.14
MW141	1302_MW141_220309	9/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.29	**0.29**	**0.13**	<0.01	0.16
	1302_QC103_220309	9/03/2022	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.33	**0.33**	**0.15**	<0.01	0.18
MW144	1302_MW144_220309	9/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.06	<0.02	0.16	<0.02	<0.02	0.13	0.02	<0.05	<0.02	<0.02	2.69	**2.15**	**1.16**	0.03	0.99
MW156	1302_MW156_220310	10/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.29	<0.1	<0.02	<0.02	<0.02	0.17	0.06	0.58	<0.02	<0.02	0.28	0.09	<0.05	<0.02	<0.02	8.86	7.26	**5.09**	0.13	2.17
MW176	1302_MW176_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.13	**0.13**	**0.08**	<0.01	0.05
MW180	1302_MW180_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.08	**0.08**	<0.01*	<0.01	0.08
MW185	1302_MW185_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.02	0.02	<0.01*	<0.01	0.02
MW190	1302_MW190_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.03	0.03	**0.02**	<0.01	0.01
MW191	1302_MW191_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.17	<0.02	<0.02	0.09	0.03	<0.05	<0.02	<0.02	2.5	**2.07**	**1.26**	0.03	0.81
MW194	1302_MW194_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.08	0.02	0.36	<0.02	<0.02	0.14	0.06	<0.05	<0.02	<0.02	4.49	**3.64**	**2.41**	0.06	1.23
MW195	1302_MW195_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.2	**0.2**	**0.12**	<0.01	0.08
MW197	1302_MW197_220309	9/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.2	<0.1	<0.02	<0.02	<0.02	0.15	0.04	0.68	<0.02	<0.02	0.27	0.11	<0.05	<0.02	<0.02	9.05	**7.48**	**4.9**	0.12	2.58
MW200	1302_MW200_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.71	**0.61**	**0.36**	<0.01	0.25
MW201	1302_MW201_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.02	0.02	**0.01**	<0.01	0.01
MW205	1302_MW205_220310	10/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.26	<0.1	<0.02	<0.02	<0.02	0.1	0.05	0.4	<0.02	<0.02	0.23	0.07	<0.05	<0.02	<0.02	5.21	**4.01**	**2.45**	0.09	1.56
MW209	1302_MW209_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
MW210	1302_MW210_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.02	0.05	<0.02	<0.05	<0.02	<0.02	1.53	**1.32**	**0.82**	0.02	0.5
MW211	1302_MW211_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.1	**0.1**	**0.06**	<0.01	0.04
MW240	1302_MW240_220309	9/03/2022	Primary	<0.05	<0.05	0.32	2.43	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.55	1.4	0.06	0.22	<0.02	0.8	2.76	6.79	0.89	0.07	1.28	2.89	<0.05	<0.02	<0.02	51.7	**26.5**	**19.2**	**3.71**	7.34
MW241	1302_MW241_220309	9/03/2022	Primary	<0.05	<0.05	0.37	1.32	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.21	1.2	<0.02	0.09	<0.02	0.69	2.3	5.59	0.8	<0.02	0.8	2.47	<0.05	<0.02	<0.02	45.2	**25.3**	**19**	**3.1**	6.3
	1302_QC102_220309	9/03/2022	Intralab Duplicate	<0.05	<0.05	0.36	1.26	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.24	1.2	<0.02	0.08	<0.02	0.66	2.36	5.53	0.77	<0.02	0.8	2.47	<0.05	<0.02	<0.02	44.4	**24.6**	**18.3**	**3.07**	6.26
	1302_QC201_220309	9/03/2022	Interlab Duplicate	<0.01	<0.01	0.35	0.75	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.65	0.9	<0.01	0.098	<0.01	0.49	1.8	2.4	0.77	<0.01	0.94	1.3	<0.02	<0.02	<0.01	28.05	**15.90**	**12**	**1.7**	3.9
MW297	1302_MW297_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.1	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	1.63	**1.44**	**1.07**	0.02	0.37
MW303	1302_MW303_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.62	0.3	<0.02	<0.02	<0.02	1.05	0.35	3.54	<0.02	0.02	2.1	0.53	<0.05	<0.02	<0.02	42.1	**31.8**	**18.8**	**0.77**	13
	1302_QC101_220308	8/03/2022	Intralab Duplicate	<0.05	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.99	0.4	<0.02	<0.02	<0.02	1.24	0.39	4.11	<0.02	<0.02	2.54	0.63	<0.05	<0.02	<0.02	45.1	**32.9**	**19.1**	**0.84**	13.8
MW422	1302_MW422_220309	9/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	39.4	6.3	0.2	<0.02	<0.02	9.88	5.65	71.2	0.1	0.09	33.2	14	<0.05	<0.02	<0.02	521	**328**	**93.3**	**12.5**	235
MW451	1302_MW451_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.05	0.05	**0.03**	<0.01	0.02
MW452	1302_MW452_220308	8/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.05	0.02	0.15	<0.02	<0.02	0.09	0.02	<0.05	<0.02	<0.02	3.20	**2.75**	**1.86**	0.05	0.89
MW453	1302_MW453_220309	9/03/2022	Primary	<0.05	<0.05	0.29	0.11	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.09	1.00	<0.02	<0.02	<0.02	0.28	1.93	4.97	0.24	<0.02	0.90	2.05	<0.05	<0.02	<0.02	23.40	**8.18**	**3.66**	**2.34**	4.52
MW454	1302_MW454_220309	9/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.27	0.30	<0.02	<0.02	<0.02	1.45	0.26	4.00	<0.02	<0.02	2.76	0.74	<0.05	<0.02	<0.02	48.60	**36.20**	**22.00**	**0.64**	14.20

Notes:
µg/L: micrograms per litre
LOR: limit of reporting
* LOR is above guideline value
Denotes first time detection above LOR for Sum of PFHxS+PFOS or PFOA
Denotes new exceedance of human health or ecological screening criteria

Table 3a
Surface Water Field Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

Location ID	Sampled Date	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Redox (mV)	Redox corrected (mV)	Temp (^{o}C)	Turbidity (NTU)	Water Colour	Odour	Sheen	Sample Method
SW170	13/01/2022 12:38	3.56	90.9	59.1	6.67	94.9	296.4	31.6	-	Colourless	Odourless	No Sheen	Grab Sample
SW104	14/01/2022 9:50	3.29	90.2	58.6	6.81	177.9	380.1	30.6	14.7	Colourless	Odourless	No Sheen	Grab Sample
SW106	14/01/2022 8:30	3.34	285.1	185.3	8.00	112.1	315.4	29.1	-0.3	Colourless	Odourless	No Sheen	Grab Sample
SW108	13/01/2022 15:40	3.50	59.9	38.9	5.99	162.3	365.5	29.2	3.5	Colourless	Odourless	No Sheen	Grab Sample
SW109	13/01/2022 15:15	3.15	65.8	42.8	6.07	153.1	356.1	29.5	1.3	Colourless	Odourless	No Sheen	Grab Sample
SW112	14/01/2022 10:14	3.58	558.0	362.7	6.56	133.1	336.0	29.7	2.2	Colourless	Odourless	No Sheen	Grab Sample
SW113	14/01/2022 10:25	3.35	7296.0	4742.4	6.29	156.3	358.8	30.2	8.9	Colourless	Odourless	No Sheen	Grab Sample
SW114	14/01/2022 9:30	2.34	180.1	117.1	7.08	153.9	355.7	31.1	0.8	Colourless	Odourless	No Sheen	Grab Sample
SW115	14/01/2022 8:05	2.40	52.1	33.9	8.25	104.8	307.9	29.4	3.9	Colourless	Odourless	No Sheen	Grab Sample
SW120	14/01/2022 10:46	3.14	6132.0	3985.8	6.79	140.2	343.7	28.8	22.3	Colourless	Odourless	No Sheen	Grab Sample
SW124	14/01/2022 11:05	3.14	24913.0	16193.5	6.71	156.8	358.5	31.3	60.3	Colourless	Odourless	No Sheen	Grab Sample
SW125	14/01/2022 11:28	3.79	671.0	436.2	8.13	88.5	290.2	31.3	1.0	Colourless	Odourless	No Sheen	Grab Sample
SW132	14/01/2022 13:15	3.12	301.0	195.7	7.97	53.7	255.5	31.2	0.8	Colourless	Odourless	No Sheen	Grab Sample
SW133	14/01/2022 13:47	4.31	461.1	299.7	7.69	102.1	303.0	32.3	38.5	Colourless	Odourless	No Sheen	Grab Sample
SW143	14/01/2022 14:04	3.66	2329.0	1513.9	7.43	114.4	315.5	32.1	44.0	Colourless	Odourless	No Sheen	Grab Sample
SW152	17/01/2022 14:10	3.27	87.4	56.8	7.30	118.9	322.9	28.2	50.5	Colourless	Odourless	No Sheen	Grab Sample
SW156	17/01/2022 13:33	3.99	58.0	37.7	7.83	106.5	311.0	27.5	2.2	Colourless	Odourless	No Sheen	Grab Sample
SW160	17/01/2022 13:16	4.50	42.0	27.3	7.93	105.1	308.8	28.6	16.9	Colourless	Odourless	No Sheen	Grab Sample
SW162	13/01/2022 13:15	3.69	50.7	33.0	6.77	118.6	320.2	31.4	15.1	Colourless	Odourless	No Sheen	Grab Sample
SW168	13/01/2022 15:53	4.25	51.3	33.3	5.61	205.1	406.5	31.7	2.4	Colourless	Odourless	No Sheen	Grab Sample
SW178	17/01/2022 12:40	3.59	52.3	34.0	7.96	108.8	313.2	27.7	149.6	Colourless	Odourless	No Sheen	Grab Sample
SW181	17/01/2022 12:58	4.28	95.0	61.8	7.82	105.5	309.7	27.9	34.3	Colourless	Odourless	No Sheen	Grab Sample

Notes:
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
NTU: nephelometric turbidity unit
^{o}C: degrees celcius

Table 3b
Surface Water Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

AECOM

					PFAS Full Suite																												
					10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTeDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
					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
				LOR	0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.00023	19	
Ecological Receptors	**PFAS NEMP Freshwater 99%**																																
Human Health Receptors	**PFAS NEMP Health Drinking Water**																													0.07		0.56	
	PFAS NEMP Recreational Water																													2		10	
Location Code	**Field ID**	**Sample Date**	**Sample Type**	**Lab Report**																													
SW104	1302_SW104_220114	14/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.08	<0.02	0.12	<0.02	<0.02	0.05	<0.02	<0.05	<0.02	<0.02	2.07	**1.74**	**1.24**	0.02	0.5
SW106	1302_SW106_220114	14/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.04	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.95	**0.81**	**0.54**	<0.01	0.27
	1302_QC101_220114	14/01/2022	Intralab Duplicate	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.04	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	1	**0.86**	**0.59**	<0.01	0.27
SW108	1302_SW108_220113	13/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.05	<0.02	0.05	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	1.04	**0.87**	**0.57**	0.01	0.3
SW109	1302_SW109_220113	13/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.99	**0.84**	**0.56**	0.01	0.28
SW112	1302_SW112_220114	14/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.93	**0.79**	**0.52**	0.01	0.27
SW113	1302_SW113_220114	14/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.68	**0.59**	**0.39**	<0.01	0.2
SW114	1302_SW114_220114	14/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.17	<0.1	<0.02	<0.02	<0.02	0.15	0.04	0.39	<0.02	<0.02	0.16	0.07	<0.05	<0.02	<0.02	5.83	**4.79**	**3.24**	0.06	1.55
SW115	1302_SW115_220114	14/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.83	**0.69**	**0.43**	<0.01	0.26
SW120	1302_SW120_220114	14/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.06	<0.02	0.09	<0.02	<0.02	0.05	<0.02	<0.05	<0.02	<0.02	1.7	**1.43**	**0.91**	0.02	0.52
SW124	1302_SW124_220114	14/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	0.05	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.83	**0.76**	**0.59**	<0.01	0.17
SW125	1302_SW125_220114	14/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	<0.1	<0.02	<0.02	<0.02	0.09	0.04	0.26	<0.02	<0.02	0.15	0.05	<0.05	<0.02	<0.02	4.67	**3.87**	**2.41**	0.06	1.46
SW132	1302_SW132_220114	14/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.18	**0.18**	**0.12**	<0.01	0.06
SW133	1302_SW133_220114	14/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	0.04	<0.05	<0.02	<0.02	0.21	**0.13**	**0.06**	<0.01	0.07
SW143	1302_SW143_22011	14/01/2022	Primary	ES2201342	<0.05	<0.05	0.12	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	0.02	0.06	<0.02	<0.02	<0.02	0.06	<0.05	<0.02	<0.02	0.52	**0.25**	**0.16**	0.01	0.09
SW152	1302_SW152_220117	17/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.22	**0.22**	**0.18**	<0.01	0.04
	1302_QC201_220117	17/01/2022	Interlab Duplicate	RN1340447	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	0.16	**0.16**	**0.13**	<0.01	0.03
	1302_QC102_220117	17/01/2022	Intralab Duplicate	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.23	**0.23**	**0.19**	<0.01	0.04
SW156	1302_SW156_220117	17/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.17	**0.13**	**0.1**	0.02	0.03
SW160	1302_SW160_220117	17/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.14	**0.12**	**0.09**	<0.01	0.03
SW162	1302_SW162_220113	13/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.02	0.02	**0.02**	<0.01	<0.01
SW168	1302_SW168_220113	13/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.05	<0.02	0.11	<0.02	<0.02	0.06	<0.02	<0.05	<0.02	<0.02	1.63	**1.32**	**0.9**	0.03	0.42
SW170	1302_SW170_220113	13/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.59	**0.57**	**0.42**	<0.01	0.15
	1302_QC100_220113	13/01/2022	Intralab Duplicate	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.51	**0.51**	**0.37**	<0.01	0.14
	1302_QC200_220113	13/01/2022	Interlab Duplicate	RN1340447	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	0.281	**0.271**	**0.19**	<0.01	0.081
SW178	1302_SW178_220117	17/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.38	**0.38**	**0.34**	<0.01	0.04
SW181	1302_SW181_220117	17/01/2022	Primary	ES2201342	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.23	**0.23**	**0.18**	<0.01	0.05

Notes:
µg/L: micrograms per litre
* LOR is above guideline value
Denotes new exceedance of human health screening criteria

Table 4a
March Surface Water Field Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

Location ID	Sampled Date	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Redox (mV)	Redox corrected (mV)	Temp (°C)	Water Colour	Odour	Sheen	Sample Method
SW106	15/03/2022	5.28	48.2	31	5.90	83.6	285.4	31.2	Colourless	Odourless	No Sheen	Grab Sample
SW108	15/03/2022	4.61	47.2	31	5.50	88.5	290.7	30.6	Orange/brown	Odourless	No Sheen	Grab Sample
SW109	2/03/2022	3.59	17.8	12	5.75	-32.2	169.5	31.3	Colourless	Odourless	No Sheen	Grab Sample
	14/03/2022	3.77	55.1	36	6.22	60.3	262.4	30.7	Yellow	Odourless	No Sheen	Grab Sample
SW112	16/03/2022	7.50	760.0	494	7.28	57.4	260.9	28.9	Orange/brown	Odourless	No Sheen	Grab Sample
SW113	16/03/2022	4.71	18244.0	11859	7.43	119.4	322.1	30.0	Colourless	Seasalt	No Sheen	Grab Sample
SW114	14/03/2022	4.09	45.0	29	4.98	91.0	292.2	32.0	Colourless	Odourless	No Sheen	Grab Sample
SW115	14/03/2022	3.89	48.5	32	5.66	79.6	280.5	32.4	Colourless	Odourless	Organic	Grab Sample
SW120	15/03/2022	3.01	3098	2014	7.10	103.3	306.1	29.8	Colourless	Odourless	No Sheen	Grab Sample
SW124	16/03/2022	3.98	38563	25066	7.91	105.5	307.8	30.5	Colourless	Odourless	No Sheen	Grab Sample
SW125	15/03/2022	5.56	174.6	113	6.79	98.3	299.8	31.6	Colourless	Odourless	No Sheen	Grab Sample
SW132	15/03/2022	4.13	50.8	33	5.73	86.2	287.5	31.8	Colourless	Odourless	No Sheen	Grab Sample
SW133	15/03/2022	5.00	173.6	113	6.55	81.0	281.9	32.4	Colourless	Organic	No Sheen	Grab Sample
SW143	16/03/2022	6.27	3019.0	1962	8.25	57.1	259.9	29.8	Colourless	Odourless	No Sheen	Grab Sample
SW152	14/03/2022	6.17	69.6	45	5.56	84.7	285.0	33.1	Colourless	Odourless	No Sheen	Grab Sample
SW162	14/03/2022	3.34	48.7	32	6.36	79.3	280.7	31.7	Slight brown	Odourless	No Sheen	Grab Sample
SW168	15/03/2022	4.11	120.2	78	5.17	90.5	290.3	33.8	Colourless	Odourless	No Sheen	Grab Sample
SW170	2/03/2022	Very low flow - field parameters not collected										
	14/03/2022	5.03	154.4	100	5.53	98.7	300.2	31.5	Colourless	Odourless	No Sheen	Grab Sample
SW178	14/03/2022	5.38	55.1	36	6.75	84.5	287.2	29.9	Colourless	Odourless	No Sheen	Grab Sample
SW181	14/03/2022	5.61	57.4	37	6.71	74.5	277.7	29.3	Slight brown	Odourless	No Sheen	Grab Sample
SW300	2/03/2022	3.35	18.0	12	5.75	-30.2	171.9	30.7	Colourless	Odourless	No Sheen	Grab Sample

Notes:
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
°C: degrees celcius

Table 4b
Surface Water Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Darwin

					PFAS Full Suite																													
					10:2 FTS	**4:2 FTS**	**6:2 FTS**	**8:2 FTS**	**EtFOSA**	**EtFOSAA**	**EtFOSE**	**MeFOSA**	**MeFOSAA**	**MeFOSE**	**PFBS**	**PFBA**	**PFDS**	**PFDA**	**PFDoDA**	**PFHpS**	**PFHpA**	**PFHxA**	**PFNA**	**FOSA**	**PFPeS**	**PFPeA**	**PFTeDA**	**PFTrDA**	**PFUnDA**	**Sum of PFAS**	**Sum of PFHxS and PFOS**	**PFOS**	**PFOA**	**PFHxS**
					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
				LOR	0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01	0.01	0.01
Ecological Receptors	PFAS NEMP Freshwater 99%																															**0.00023**	**19**	
Human Health Receptors	PFAS NEMP Health Drinking Water																														**0.07**		**0.56**	
	PFAS NEMP Recreational Water																														**2**		**10**	
Location Code	**Field ID**	**Sample Date**	**Sample Type**	**Lab Report**																														
SW106	1302_SW106_220315	15/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	0.66	**0.54**	**0.34**	0.01	0.2
	1302_QC201_220315	15/03/2022	RN1348951	Interlab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.019	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.048	<0.02	<0.02	<0.02	0.02	<0.05	<0.02	<0.02	1.008	**0.91**	**0.67**	0.011	0.24
SW108	1302_SW108_220315	15/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	0.64	**0.54**	**0.35**	0.01	0.19
SW109	1302_QC100_220302	2/03/2022	ES2207387	Interlab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.7	**0.57**	**0.35**	0.01	0.22
	1302_QC200_220302	2/03/2022	RN1345719	Intralab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.022	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.039	<0.01	<0.01	0.023	<0.02	<0.02	<0.02	<0.01	0.646	**0.55**	**0.36**	0.012	0.19
	1302_SW109_220302	2/03/2022	ES2207387	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	0.68	**0.56**	**0.34**	0.01	0.22
	1302_SW109_220314	14/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.79	**0.64**	**0.41**	0.02	0.23
SW112	1302_SW112_220316	16/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	0.7	**0.58**	**0.37**	0.01	0.21
SW113	1302_SW113_220316	16/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.37	**0.34**	**0.22**	<0.01	0.12
SW114	1302_SW114_220314	14/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	<0.1	<0.02	<0.02	<0.02	0.1	0.04	0.48	<0.02	<0.02	0.2	0.1	<0.05	<0.02	<0.02	5.57	**4.36**	**2.8**	0.08	1.56
SW115	1302_SW115_220314	14/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.1	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.14	<0.02	<0.02	0.09	<0.02	<0.05	<0.02	<0.02	2.05	**1.65**	**0.94**	0.03	0.71
SW120	1302_SW120_220315	15/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	1.05	**0.88**	**0.54**	0.02	0.34
SW124	1302_SW124_220316	16/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.09	**0.09**	**0.06**	<0.01	0.03
SW125	1302_SW125_220315	15/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.09	0.04	0.31	<0.02	<0.02	0.14	0.07	<0.05	<0.02	<0.02	5.25	**4.36**	**2.88**	0.08	1.48
SW132	1302_SW132_220315	15/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.2	**0.2**	**0.13**	<0.01	0.07
SW133	1302_SW133_220315	15/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.04	<0.05	<0.02	<0.02	0.19	**0.11**	**0.05**	0.01	0.06
SW143	1302_SW143_220316	16/03/2022	ES2209679	Primary	<0.05	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	0.02	<0.02	<0.02	0.04	<0.05	<0.02	<0.02	0.4	**0.2**	**0.14**	0.02	0.06
SW152	1302_SW152_220314	14/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.22	**0.22**	**0.16**	<0.01	0.06
SW162	1302_SW162_220314	14/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.01	0.01	**0.01**	<0.01	<0.01
SW168	1302_SW168_220315	15/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	<0.02	0.02	0.12	<0.02	<0.02	0.04	0.03	<0.05	<0.02	<0.02	1.07	**0.77**	**0.47**	0.04	0.3
	1302_QC101_220315	15/03/2022	ES2209679	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.11	<0.02	<0.02	0.05	0.03	<0.05	<0.02	<0.02	1.04	**0.76**	**0.46**	0.04	0.3
SW170	1302_SW170_220302	2/03/2022	ES2207387	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.48	**0.44**	**0.29**	<0.01	0.15
	1302_SW170_220314	14/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.52	**0.48**	**0.33**	<0.01	0.15
	1302_QC100_220314	14/03/2022	ES2209679	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.53	**0.49**	**0.34**	<0.01	0.15
	1302_QC200_220314	14/03/2022	ES2209679	Interlab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.52	**0.48**	**0.34**	<0.01	0.14
SW178	1302_SW178_220314	14/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
SW181	1302_SW181_220314	14/03/2022	ES2209679	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.32	**0.29**	**0.23**	<0.01	0.06

Appendix C

Sampling Logs

Appendix C Sampling Logs

PFAS @ RAAF Pann 13/01/2022

Site	PH	EC	ORP	DO mg/L	TURB	Time	Temp (°C)	Odour
SW170	6.67	90.9	94.9	3.51	—	1238	31.6	
SW162	6.77	50.7	118.6	3.69	15.1	1145 pm	31.4	NO
SW109	6.07	65.8	150.1	3.15	1.3	1515	29.5	NO
SW108	5.99	59.9	162.3	3.50	3.5	1540	29.2	NO
SW168	5.61	51.3	205.1	4.25	2.4	1553	31.7	NO
~~SW112~~	~~6.02~~	~~449.9~~	~~133.3~~	~~3.24~~	~~3.8~~	~~1610~~	~~29.0~~	~~NO~~
~~SW113~~	~~5.83~~	~~29 467~~	~~170.8~~	~~3.40~~	~~7.4~~	~~1625~~	~~30.2~~	~~NO~~

14/1/22

SW115	8.25	521	104.8	2.40	3.9	8:05	29.4	N.O
SW102	8.00	285.1	112.1	3.34	-0.3	8:30	29.1	N.O.
SW114	7.08	180.1	153.9	2.34	0.80	9:30	31.1	NO
SW104	6.81	90.2	177.9	3.29	14.7	9:50	30.6	N.O
SW112*	6.51	558	133.1	3.58	2.2	10:14	29.7	N.O
SW113*	6.29	7296	156.3	3.35	8.9	10:25	30.2	N.O
SW120	6.74	6132	140.2	3.14	22.3	10:46	28.8	N.O.
SW124	6.71	24913	156.8	3.14	60.3	11:05	31.3	NO
SW125	8.13	671	88.5	3.79	1.0	11:28	31.7	ORG
SW132	7.97	301.0	53.7	3.12	0.8	13:15	31.2	N.O
SW133	7.69	461.1	102.1	4.31	38.5	13:47	32.3	N.O
SW143	7.43	2329	114.4	3.66	44	14:04	32.1	NO

ORG Organic
N.O. Odour
O.S Ocean Smell.
* Resampled @ low tide — OUTGOING.

	PH	EC	ORP	DO	TUR	Time	Temp	Odour
SW178	7.96	52.3	108.8	3.59	149.6	1240p	27.7	—
SW181	7.82	9~~5~~.0	105.5	4.28	34.3	1258p	27.9	—
SW160	7.93	42.0	105.1	4.50	16.9	1316p	28.6	—
SW152	7.30	87.4	118.9	3.27	50.5	1410p	28.2	
SW156	7.83	58.0	106.5	3.99	2.2	1333p	27.5	

ANZ

FQM - NAPL and Groundwater Level Gauging Record

AECOM

Q4AN(EV)-414-FM1

Project Name:	WQMP / OMP	Project Location:	DARWIN	PM Name:	[redacted]
Project Number:		Client:		Fieldwork Staff Name:	

Confirm NAPL and groundwater levels by repeat measurements. All columns must be completed. If NAPL is not present in a well write 'ND' (Not Detected) in the relevant column.

Field Data

Well ID	Date (dd/mm/yy)	Time (24hr:mm)	PID Reading (ppm)	Depth to LNAPL (mBTOC)	Depth to Groundwater (mBTOC)	LNAPL Thickness (m)	Depth to DNAPL (mBTOC)	Total Well Depth (mBTOC)	DNAPL Thickness (m)	Comments (well condition, odour, NAPL colour and viscosity)
MW191	2/3/22	11:22								COVER DISLODGED RETURN MON
MW190	"	"								" "
MW185	2/3/22	1225	—	—	1.188	—	—	10.600	—	SED. ON TIP. NO ODOUR
MW200	2/3/22	1625	—	—	4.124	—	—	12.731	—	GOOD, NO ODOUR
MW209	3/3/22	7:30	—	—	0.885	—	—	11.325	—	GOOD, NO ODOUR.
MW180	2/3/22	1710	—	—	3.822	—	—	15.200	—	WATER & SHEEN (BLK-TOP OF CASING NO ODOUR
MW176	2/3/22	1600	—	—	2.649	—	—	11.700	—	WATER IN CATH, O/C, J CAP. NO ODOUR
MW211	2/3/22	1655	—	—	3.875	—	—	14.950	—	GOOD, NO ODOUR
MW210	3/3/22	7:45	—	—	1.894	—	—	11.425	—	GOOD, NO ODOUR
MW195	3/3/22	820	—	—	1.157	—	—	11.275	—	GOOD, NO ODOUR
MW194	3/3/22	835	—	—	1.319	—	—	12.440	—	GOOD, NO ODOUR. WST. PS.
MW128	3/3/22	9:55	—	—	1.795	—	—	14.655	—	WATER IN CATH BLK. TOC. GOOD NO ODOUR
MW452	3/3/22	10:25	—	—	1.891	—	—	13.540	—	GOOD, NO ODOUR. PS @ 6m
MW148	3/3/22	10:30	—	—	—	—	—	—	—	WELL BLOCKED H/S STUCK? MW201
MW451	"	10:35	—	—	3.026	—	—	>30m	—	TAPE TOO SHORT. GOOD, NO ODOUR. 30m?
MW201	3/ "	10:45	—	—	2.175	—	—	8.065	—	GOOD, NO ODOUR SLT H/SE ~5.
MW103	3/3/22	12:15	—	—	2.483	—	—	12.230	—	SMALL AMT ON TIP GOOD, NO ODOUR H/SE 6m
MW107	"	12:35	—	—	2.693	—	—	14.940	—	GOOD, NO ODOUR INST. H/SE 7m
MW215	"		—	—		—	—		—	CANT ACCESS — MW181 CONTINGENCY.
MW240	"	14:20	—	—	2.287	—		14.448	—	GOOD, NO ODOUR.

Measurement Equipment

Make & Model:		Supplier:	
Serial No.:		Calibration Report Provided?	

Notes/Comments

(PID) - photo ionisation detector; (ppm) - parts per million; (LNAPL) - light non-aqueous phase liquids; (DNAPL) - dense light non-aqueous phase liquid; (mBTOC) - metres below top of casing

Approval and Distribution

[redacted]

[redacted]

Distribution: Project Central File

ANZ

FQM - NAPL and Groundwater Level Gauging Record

AECOM

Q4AN(EV)-414-FM1

Project Name:	WQMP Kwinana	**Project Location:**		**PM Name:**	[redacted]
Project Number:		**Client:**		**Fieldwork Staff Name:**	

Confirm NAPL and groundwater levels by repeat measurements. All columns must be completed. If NAPL is not present in a well write 'ND' (Not Detected) in the relevant column.

Field Data

Well ID	Date (dd/mm/yy)	Time (24hr:mm)	PID Reading (ppm)	Depth to LNAPL (mBTOC)	Depth to Groundwater (mBTOC)	LNAPL Thickness (m)	Depth to DNAPL (mBTOC)	Total Well Depth (mBTOC)	DNAPL Thickness (m)	Comments (well condition, odour, NAPL colour and viscosity)
MW453	3/3/22	14:45	—	—	1.755	—	—	15.055	—	GOOD NO ODOUR.
MW241	3/3/22	1215	—	—	1.864	—	—	14.468	—	OK COND, NO ODOUR, ANTS CASING FLOOR.
MW197	↓	1505	—	—	3.826	—	—		—	STRONG OBSCURE, GOOD SLIGHT H/S NO ODOUR, INT. H/S
MW454	↓	1625	—	—	1.544	—	—	12.400	—	GOOD COND, NO ODOUR SETH/S@ 2.5m
MW144	4/3/22	1055	—	—	6.555	—	—	15.755	—	NO ODOR GC, SED ON TIP. SEVS @10m
MW133	4/3/22	1116	3.4	—	4.482	—	—	14.880	—	N.O. GC. WATER IN HATCH. SOAKED UP WITH RAGS
~~MW240~~	4/3/22	1215								
MW242	4	1215	2.4	—	6.586	—	—	14.410	—	V MILD HC ODOR.
MW303	11	1245	1.8	—	6.149	—	—	15.500	—	H/C ODOUR G.C.
MW297	11	1320	28.5	—	4.118	—	—	15.220	—	H/C ODOUR ON PROBE G.C H/S@ 10.5
MW422	11	1335	2.3	—	1.710	—	—	14.810	—	GC H/C ODOR, STRONG. H/S @9m
MW139	11	1350	—	—	2.227	—	—	14.440	—	SED. ON TIP, G.C, NO. H/S @ 8m
MW141	11	1405	—	—	4.194	—	—	15.950	—	N.O. GC H/S @ 8m
MW117	7/3/22	830	—	—	7.839	—	—	13.835	—	SURFACE GC. N.O. H/S @ 9m
MW205	11	845	—	—	2.880	—	—	14.960	—	GC - MOD.
MW115	11	9—	—	—	3.38	—	—	15.700	—	GC. NO. - WATER IN CATT
MW156	11	915	—	—	1.582	—	—	11.970	—	GC. N.O.
MW190	11	10:10	—	—	1.474	—	—	12.395	—	SED ON TIP GC - NO FROGS. (HIDING)
MW191	11	950	—	—	2.760	—	—	12.755	—	N.O. G.C. H/S @ 7m
										NO. GC. LIGHT SED. ON TIP H/S @

Measurement Equipment

Make & Model:		**Supplier:**	
Serial No.:		**Calibration Report Provided?**	

Notes/Comments

(PID) - photo ionisation detector; (ppm) - parts per million; (LNAPL) - light non-aqueous phase liquids; (DNAPL) - dense light non-aqueous phase liquid; (mBTOC) - metres below top of casing

Approval and Distribution

[redacted]

[redacted]

Distribution: Project Central File

ANZ

AECOM

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:	~~WQMP~~ PEASOMP	Project Number:	60621561 4.1	PM Name:	[redacted]
Client:	DOO	Project Location:	DUNN	Fieldwork Stan:	[redacted]

Sample Date: 7/5 / 08/03

Well Development or Well Sampling Event? (circle)

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

Time 7/5	Cumulative Vol. Removed (L)	SWL (m-pvc)	~~Pump Rate~~ FLOW	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
MW128 12:10	1.00	-	-	2.06	145.1	4.39	135.5	31.9	BROWN/ORANGE AT LAST 30cm CLEAR ABOVE
MW103 12:46	1.00		~~3.56~~	1.69	96.8	4.68	113.9	32.2	BROWN @ BOTTOM 1/3. CLEAR ABOVE ROOTS DOWN TOP
MW176 8/3 6.55	1.00			2.60	148.8	5.81	111.0	30.8	Brown/orange bottom 1/3 Clear above rest of tube
MW200 7.30	1.00			2.07	61.5	4.66	129.1	30.9	Majority clear/last 10 cm brown light
MW211 7.47	1.00			2.20	266	5.35	132.5	31.2	Light ~~grey~~/brown @ 25 cm bottom
MW18 7.58	1.00			5.20	65.1	4.82	134.1	33.2	Light brown/clear @ 5cm bottom
MW201 8:25	.95			2.71	55572	5.31	177.8	31.4	ORANGE 1/3 FROM BOTTOM CLEAR ABOVE. N.O. (HIGH FLOE)
MW452 8:35	1.00			2.14	2640	5.90	108.6	31.1	BROWN/RANGE 1/2 CLEAR ABOVE. N.O.
MW451 8:48	1.00			1.42	255.9	6.34	59.6	31.2	CLEAR
MW133 10.21	1.00			1.44	61.2	5.10	132.5	32.2	Clear orange inf hydro carbon odour.
MW103 1145	1.00			2.37	295.2	6.40	-24.0	32.4	Strong HC odour
MW~~197~~ 12.20	1.00			2.70	45.1	4.73	147.1	30.5	Clear HC odour Globules
MW185 14.30	1.00			1.65	562	5.06	156.6	32.0	Clear throughout slight sediment at bottom.
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information	Field Comments
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)			Bore volume calculation, bore condition, fate of tubing, redox correction etc.
		x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic			

Approval and Distribution

[redacted] Date

WELL ID	TIME	DATE	VOL	DO mg/L	EC ms/cm	pH	ORP	TEMP C	Comments
MW 195	14:52	08/03	1.0	1.78	62.8	5.00	149.7	31.3	Translucent - white, Light orange brown base. No odour.
MW 194	14:59	08/03	1.0	1.65	42.9	4.77	157.4	31.4	Clear throughout. Slight organic odour
MW 190	15:14	08/03	1.0	1.87	55.6	5.10	154.5	32.5	Orange brown bottom 1/3. Slight organic odour.
MW 191	15:26	08/03	1.0	2.25	64.6	5.08	159.1	32.5	orange brown Light 15cm from bottom.
MW 210	15:37	08/03	1.0	2.00	110.7	5.90	140.3	33.0	Brown/orange ~~sediment~~ sediment & clear top 1/2 - Strong organic odour
MW 209	16:00	8/3	1.0	2.38	1450	5.25	156.6	32.2	SED. @ base of MS Orange @ 1/2 almost Clear Above S.O.
MW 107	0820	9/3	1.0	2.16	107.1	5.30	137.8	30.4	MINOR ROOTS @ TOP OF COLUMN BOTTOM 1/3 ORANGE W/ SED. CLEAR/ORANGE ABOVE MILD ORG. ODOUR
MW 421	0850	"	1.0	3.39	51.5	4.80	150.1	30.6	CLEAR W/ WHITE SUSPENDED PARTICULATE MATTER, SHEEN ON SURFACE 50% MILD ORG. ODOUR.
MW 420	0925		1.0	2.35	53.6	5.24	94.2	30.9	CLEAR W/ SLIGHT ORANGE BASE N.O.
MW 197	0920		1.0	1.50	66.1	5.42	34.2	29.6	ORG. ODOUR, SUSP. PARTICULATES, ROOTS ON TOP.
MW 453	0935		1.0	3.67	49.8	4.72	133.1	30.9	CLEAR 2/3 BOTTOM 1/4 PALE YELLOW/WHITE. N.O.

8/3/22

9/3/22

WELL ID	TIME/DATE	VOL	DO mg/L	EC µS/cm	pH	ORP	TEMP °C	COMMENTS
MW144	10:00 9/3/22	1.0	4.42	42.6	4.65	148.6	31.3	CLEAR, N.O.
MW141 DUP	10:20	1.0	1.75	58.6	4.75	152.9	31.0	CLEAR, N.O.
MW139	10:35	1.0	1.94	46.2 46.2	4.95	159.3	31.0	CLEAR TOP 1/2, DARK BROWN ORANGE BOTTOM 1/4 N.O.
MW422	10:50	1.0	1.71	57.6	5.20	146.8	32.7	CLEAR 1/2 TOP. BOTTOM 1/4 BROWN ORANGE N.O. SLIGHT BASE
MW454	10:55	1.0	3.29	49.7	4.94	164.1	31.6	ORANGE/BROWN BOTTOM 1/4 CLEAR ABOVE N.O.
MW112	8:30	1.0	4.65	57.9	4.46	97.7	32.2	CLEAR, N.O.
MW205	8:50	1.0	2.56	38.5	4.57	114.1	31.6	SLIGHT ORANGE/BROWN @ BOTTOM CLEAR FOR 5/6 SLIGHT ORG. ODOR
MW115	9:00	1.0	3.92	57.5	4.05	157.1	31.9	ORANGE/BROWN BOTTOM 1/3 CLEAR ABOVE SLIGHT ORGANIC ODOR
MW156	9:15	1.0	3.49	37.8	4.28	160.7	30.2	ORANGE @ BOTTOM 1/4 CLEAR ABOVE, N.O.

9/3/22

29, 012

1/3

AECOM

ANZ SURFACE

FQM - Groundwater Sampling and Purging Record PFAS OMP

Q4AN(EV)-405-FM1

Project Name:	PFAS OMP WQMP	Project Number:	[redacted]	PM Name:	[redacted]	Sample Date:	
Client:	DoD Ventia	Project Location:		Fieldwork Staff:		Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

LOCATION ~~Time~~ TIME	Cumulative Vol. Removed (L)	DATE SWL (m-pvc)	~~Pump Rate~~ TURBIDITY	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
SW170	12:10	14/3/22		5.03	154.4	5.53	98.7	31.5	CLEAR, N.O.
SW152	12:30			6.17	69.6	5.56	84.7	33.1	CLEAR, N.O.
SW178	13:15			5.38	55.1	6.75	84.5	29.9	CLEAR, N.O.
SW181	13:30			5.61	57.4	6.71	74.5	29.3	CLEAR - SLIGHT BROWN, N.O.
SW162	14:10			3.34	48.7	6.36	79.3	31.7	"
SW109	15:30			3.77	55.1	6.22	60.3	30.7	CLEAR, N.O.
SW114	16:05			4.09	45.0	4.98	91.0	32.0	CLEAR, NO. 'STICK'.
SW104	16:15			-	-	-	-	-	INACCESSIBLE.
SW115				3.89	48.5	5.66	79.6	32.4	STATION ON SURFACE, DOWN STREAM
SW125	14:20	15/3/22		5.56	174.6	6.79	98.3	31.6	MUD ORG. ODOUR, CLEAR.
									CLEAR MOSS ON SURFACE (UK. N.O.
SW120	14:40	"		5.01	3098	7.10	103.3	29.8	CLEAR, N.O. OUTGOING FLOW.
SW168	15:00	"		4.11	120.2	5.17	90.5	33.8	CLEAR, N.O.
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected			QA/QC Information	Field Comments
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO_3)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.
		x 40 mL Vial (H_2SO_4)	x 100 mL Amber	x 250 mL Plastic		

Approval and Distribution

[redacted]

[redacted]

AECOM

ANZ SURFACE

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:	PFAS OMP WQMP	**Project Number:**	[redacted]	**PM Name:**	[redacted]
Client:	DoD Ventia	**Project Location:**		**Fieldwork Staff:**	

Sample Date:

Well Development or Well Sampling Event? (circle)

General Bore Information		Parameter Info.	Decontamination	[redacted]od	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	**Corrected Redox:** Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	**Parameter method:** ☐ Downhole		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				Parameters

Calculated bore volume (L): | Includes/ excludes bore annulus (circle) | # purge volumes removed: | Total purged volume (L):

Water Quality Parameters

LOCATION ~~Time~~	TIME Cumulative Vol. Removed (L)	DATE SWL (m-pvc)	~~Pump Rate~~ TURBID.	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
15/3 SW106	1535	15/3/22		5.28	48.2	5.90	83.6	31.2	CLEAR FAST FLOWING STREAM, N.O.
SW108	1555	15/3/22		4.61	47.2	5.50	88.5	30.6	CLEAR N.O
SW132	1620	↓		4.13	~~50.8~~	5.73	86.2	31.8	CLEAR, N.O. FLOWING STREAM
SW133	1645			5.00	173.6	6.55	81.0	32.4	CLEAR, ORG. ODOUR
SW143	1030	16/3/22		6.27	3019	8.25	57.1	29.8	CLEAR, N.O.
SW112	0910	16/3/22		7.50	760.0	7.28	57.4	28.9	CLEAR, N.O. FLOWING O-GOING TIDE
SW113	0850	16/3/22		4.71	18244	7.43	119.4	30.0	CLEAR, SLIGHT OCEAN ODOUR/SALTY
SW160	—	—							DRY.
SW156	—	—							
SW124	0935	16/3/22		3.98	38563	7.91	105.5	~~30.5~~	CLEAR, N.O. ONTGOING TIDE
(RE402 RE302)									
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information	Field Commets
Field Filtered:	**Unfiltered:**		x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.
			x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic		

Approval and Distribu [redacted]

Date

Distribution: Project Central File

Appendix D

Data Validation Reports

Appendix D Data Validation Reports

DATA VALIDATION REPORT; Water & Biota

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:** 25/04/2022	
Site:	1302 – RAAF Darwin		
Matrix:	Water & Biota	**Data Verified by:**	
Laboratory:	ALS Sydney; NMI Sydney	**Date:** 29/04/2022	
Lab reference:	Water: ES2209679, ES2201342, ES2208419, ES2211499, EB2209445, RN1346368, RN1340447, ES2207387, RN1354719, RN1348951 Biota: ES2203382		

Key Findings:

The analytical data can be used as a basis for interpretation based on the following:

- Field inter-laboratory RPDs for water samples exceeded control limits for sum of PFHxS and PFOS, PFOS, PFOA and PFHxS (as shown in the RPD table). This apparent lack of precision should be taken into consideration when interpreting concentrations for PFAS concentrations close to guidelines.
- Field inter-laboratory RPDs for water samples exceeded control limits for 8:2 FTS, PFBS, PFHpS, PFHxA, PFPeA, and sum of PFAS (as shown in the RPD table). This apparent lack of precision should be taken into consideration when interpreting data quantitatively.
- The potential exists for concentrations of key COPC PFOS to be above the PFAS NEMP 99% freshwater guideline, but below the laboratory LOR. This should be taken into consideration when interpreting data and using data quantitatively.

Component		Outliers			Material impact on interpretation
		No	Yes	Comment	
Frequency of field quality assurance/quality control			✓	1	No
Number of tests requested/reported		✓			
Sample handling/preservation/holding times			✓	2	No
Frequency of laboratory QA/QC			✓	3	No
Limits of reporting (LOR)			✓	4	No
Blank analysis	Field blank	✓			
	Rinsate blank	✓			
	Trip blank	✓			
	Method blank	✓			
Field intra-laboratory relative percent differences (RPDs)		✓			
Field inter-laboratory RPDs			✓	5	No
Laboratory duplicate RPDs		✓			
Matrix spike (MS) % recoveries			✓	6	No
Laboratory control spike (LCS) % recoveries			✓	7	No
Surrogate % recoveries		✓			
Other comments		✓			

Comments

1. Frequency of field QA/QC	Field inter-laboratory duplicate samples were not collected at a frequency of one in ten primary samples for groundwater assessment of results against the PFAS National Environmental Management Plan (NEMP) 2020 (they were collected in one in twenty). The precision of the data can be assessed as acceptable based on the available intra-laboratory duplicate RPDs and the laboratory duplicate RPDs which were reported at or above the required frequencies and within control limits.

DATA VALIDATION REPORT; Water & Biota

Project Manager:	J[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:** 25/04/2022	
Site:	1302 – RAAF Darwin		
Matrix:	Water & Biota	**Data Verified by:**	
Laboratory:	ALS Sydney; NMI Sydney	**Date:** 29/04/2022	
Lab reference:	Water: ES2209679, ES2201342, ES2208419, ES2211499, EB2209445, RN1346368, RN1340447, ES2207387, RN1354719, RN1348951 Biota: ES2203382		

2. Sampling preservation	Sample receipt temperatures (12.1 – 16.4 °C) were outside of the recommended range (≤6°C) in primary water batches (ES2209679, ES2201342, ES2208419). Potential under reporting must be taken into consideration. However, as the samples were received below ambient groundwater temperature at the time of sampling (~30 °C), the samples were immediately cooled upon collection, the potential for under reporting is not considered to materially affect the interpretation of results.
3. Limits of reporting	The potential exists for concentrations of key COPC PFOS to be above the PFAS NEMP 99% freshwater guideline, but below the laboratory LOR. This should be taken into consideration when interpreting data and using data quantitatively.
4. Frequency of laboratory QA/QC	Laboratory duplicate samples were not reported for PFAS in primary water batches ES2209679, ES2203382, ES2208419, ES2201342 and ES2211499. The precision of the data can be assessed as acceptable based intra-laboratory duplicate RPDs which were reported at or above the required frequencies and generally within control limits. Matrix spikes were not reported at the required frequencies for PFAS method groups for primary water batches ES2209679, ES2203382, ES2208419, ES2201342 and ES2211499. The accuracy of the data can be assessed as acceptable based on method blanks, LCS and surrogate spike recoveries within the water batches which were reported at or above the required frequencies and within control limits.

DATA VALIDATION REPORT; Water & Biota

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:** 25/04/2022	
Site:	1302 – RAAF Darwin		
Matrix:	Water & Biota	**Data Verified by:**	
Laboratory:	ALS Sydney; NMI Sydney	**Date:** 29/04/2022	
Lab reference:	Water: ES2209679, ES2201342, ES2208419, ES2211499, EB2209445, RN1346368, RN1340447, ES2207387, RN1354719, RN1348951 Biota: ES2203382		

5. Field Inter-laboratory RPDs	Field inter-laboratory RPDs for water samples were reported within control limits, with the exception of the following (the higher concentration in **bold**): • **1302_SW170_220113** & 1302_QC200_220113 for sum of PFAS (70%), sum of PFHxS and PFOS (71%), PFOS (75%) and PFHxS (60%) • **1302_SW106_220117** & 1302_QC201_220117 for sum of PFAS (134%), sum of PFHxS and PFOS (134%)**,** PFOS (122%) and PFHxS (160%) • **1302_MW128_220307** & 1302_QC200_220307 for sum of PFAS (35%), sum of PFHxS and PFOS (41%), PFOS (39%) and PFHxS (47%) • **1302_MW241_220309** & 1302_QC201_220309 for 8:2 FTS (55%), PFBS (60%), PFHpS (34%), PFHxA (80%), PFPeA (62%), sum of PFHxS & PFOS (45%), PFOS (45%), PFOA (58%) and PFHxS (47%) • 1302_MW241_220309 & **1302_QC201_220309** for sum of PFAS (189%) • **1302_SW170_220314** & 1302_QC200_220314 for sum of PFAS (47%), PFHxS and PFOS (52%), PFOS (59%) • **1302_SW106_220315** & 1302_QC201_220315 for sum of PFAS (41%), sum of PFHxS and PFOS (51%) **and** PFOS (65%) The primary and secondary laboratories reanalysed and confirmed these results. This apparent lack of precision should be taken into consideration when interpreting concentrations for PFAS concentrations close to guidelines for sum of PFHxS and PFOS, PFOS and PFOA. As there are no adopted guideline values for 8:2 FTS, PFBS, PFHpS, PFPeA and sum of PFAS, the elevated RPD is not expected to affect interpretation of results against guidelines. However, the elevated RPDs should be taken into consideration when using the data quantitatively.

DATA VALIDATION REPORT; Water & Biota

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:**	25/04/2022
Site:	1302 – RAAF Darwin		
Matrix:	Water & Biota	**Data Verified by:**	
Laboratory:	ALS Sydney; NMI Sydney	**Date:**	29/04/2022
Lab reference:	Water: ES2209679, ES2201342, ES2208419, ES2211499, EB2209445, RN1346368, RN1340447, ES2207387, RN1354719, RN1348951 Biota: ES2203382		

6. MS % Recoveries

Matrix spike recoveries were not determined for PFBS, PRPeS, PFHxS, PFOS and PFHxA in primary batch ES2208419 as background levels were greater than or equal to 4x spike levels.
These non-determinations do not reflect method bias and do not affect data interpretation. The accuracy of the data can be assessed as acceptable based on method blanks and surrogate spike recoveries (which were reported at or above the required frequencies and within control limits for the same analytical method group (which were reported within control limits).

Matrix spike recoveries (where reported) were within control limits, with the following exceptions from primary batch ES2203382:

Analyte	Location	Recovery (%)	Range (%)	Comment
MeFOSA	1302_BIOAFA225_211125	109	88.1-105	Recovery greater than upper data quality objective
	1302_BIOAFA245_211124	119		
	1302_QC135_211124	114		
10:2 FTS	1302_BIOAFA225_211125	76	93.4-130	Recovery less than lower data quality objective

The potential exists for concentrations of MeFOSA to be bias high by up to 19% and 10:2 FTS to be bias low by up to 24 %. As there are no adopted guideline value for MeFOSA and 10:2 FTS the potential for over or under reporting is not expected to affect interpretation of the results against guidelines. However, this potential for over and under reporting should be taken into consideration when using the data quantitatively.

DATA VALIDATION REPORT; Water & Biota

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:** 25/04/2022	
Site:	1302 – RAAF Darwin		
Matrix:	Water & Biota	**Data Verified by:**	
Laboratory:	ALS Sydney; NMI Sydney	**Date:** 29/04/2022	
Lab reference:	Water: ES2209679, ES2201342, ES2208419, ES2211499, EB2209445, RN1346368, RN1340447, ES2207387, RN1354719, RN1348951 Biota: ES2203382		

3. LCS % Recoveries

The following LCS recoveries were outside control limits in primary batch ES2203382:

Analyte	Recovery (%)	Limits (%)	Comment
MeFOSA	109	88.1-105	Recovery greater than control limit
	112	88.1-105	
10:2 FTS	83.2	93.4-130	Recovery less than control limit

The LCS recovery for MeFOSA and 10:2 FTS was greater and less than the control limit respectively, therefore the potential exists for concentrations of MeFOSA to be over reported by up to 12% and 10:2 FTS be under reported by up to 16.8%
As there are no adopted guideline values for MeFOSA or 10:2 FTS the potential for over or under reporting is not expected to affect interpretation of the results against guidelines. However, this potential for over and under reporting should be taken into consideration when using the data quantitatively.

4. Other comments

It is noted that ALS Brisbane was used as the secondary laboratory for one interlaboratory duplicate sample in batch EB2209445, where the primary samples were sent to ALS Sydney (ES2211499). As the analysis of the interlaboratory duplicate and primary samples were conducted independently by a separate team utilising separate equipment, the results reported by ALS Brisbane for the interlaboratory sample are deemed appropriate for data validation purposes.

QAQC Blanks

AECOM

Lab Report Number	ES2201342	ES2201342	ES2201342	ES2208419	ES2208419	ES2208419	ES2208419	ES2209679	ES2209679
Field ID	1302 QC400 220113	1302 QC401 220114	1302 QC402 220117	1302 QC400 220307	1302 QC401 220308	1302 QC402 220309	1302 QC403 220310	1302 QC400 220314	1302 QC401 220315
Date	13/01/2022	14/01/2022	17/01/2022	7/03/2022	8/03/2022	9/03/2022	10/03/2022	14/03/2022	15/03/2022
Sample Type	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank

Analyte	Units	LOR									
PFAS Full Suite											
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

QAQC Blanks

AECOM

Lab Report Number	ES2209679	ES2211499	ES2201342	ES2201342	ES2201342	ES2203382	ES2208419	ES2208419	ES2208419
Field ID	1302_QC402_220316	1302_QC400_220401	1302_QC300_220113	1302_QC301_220114	1302_QC302_220117	1302_QC303_220127	1302_QC500_220307	1302_QC300_220307	1302_QC301_220308
Date	16/03/2022	1/04/2022	13/01/2022	14/01/2022	17/01/2022	27/01/2022	7/03/2022	7/03/2022	8/03/2022
Sample Type	Field Blank	Field Blank	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate

Analyte	**Units**	**LOR**								
PFAS Full Suite										
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

QAQC Blanks

AECOM

Lab Report Number	ES2209679	ES2209679	ES2209679	ES2211499	ES2201342	ES2203382	ES2209679	ES2211499
Field ID	1302_QC300_220314	1302_QC301_220315	1302_QC302_220316	1302_QC300_220401	QC500	1302_QC503_211115	1302_QC500_220314	1302_QC500_220401
Date	14/03/2022	15/03/2022	16/03/2022	1/04/2022	17/01/2022	15/11/2021	14/03/2022	1/04/2022
Sample Type	Rinsate	Rinsate	Rinsate	Rinsate	Trip Blank	Trip Blank	Trip Blank	Trip Blank

Analyte	**Units**	**LOR**								
PFAS Full Suite										
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Biota - Relative Percentage Differences

AECOM

Lab Report Number	ES2203382	ES2203382		ES2203382	ES2203382	
Field ID	1302_BIOAFA218_211125	1302_QC131_211125	**RPD**	1302_BIOAFA219_211125	1302_QC132_211125	**RPD**
Matrix	Biota	Biota		Biota	Biota	
Sample Type	Primary	Intra-lab Duplicate/Split		Primary	Intra-lab Duplicate/Split	
Date	25/11/2021	25/11/2021		25/11/2021	25/11/2021	
Analyte	**Units**	**LOR**						
PFAS Full Suite								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorobutanoic acid (PFBA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorononanoic acid (PFNA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
PFOS - Branched	mg/kg	0.001	<0.001	<0.001	0	0.001	<0.001	0
PFOS - Linear	mg/kg	0.001	0.001	0.002	67	0.001	0.001	0
Sum of PFAS	mg/kg	0.001	0.001	0.002	67	0.002	0.001	67
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.001	0.001	0.002	67	0.002	0.001	67
Perfluorooctanoic Acid (PFOA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Biota - Relative Percentage Differences

AECOM

Lab Report Number	ES2203382	ES2203382		ES2203382	ES2203382	
Field ID	1302_BIOAFA220_211125	1302_QC133_211125	**RPD**	1302_BIOAFA221_211125	1302_QC134_211125	**RPD**
Matrix	Biota	Biota		Biota	Biota	
Sample Type	Primary	Intra-lab Duplicate/Split		Primary	Intra-lab Duplicate/Split	
Date	25/11/2021	25/11/2021		25/11/2021	25/11/2021	
Analyte	**Units**	**LOR**						
PFAS Full Suite								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorobutanoic acid (PFBA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorononanoic acid (PFNA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
PFOS - Branched	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
PFOS - Linear	mg/kg	0.001	<0.001	<0.001	0	<0.001	0.001	0
Sum of PFAS	mg/kg	0.001	<0.001	<0.001	0	<0.001	0.001	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	0.001	0
Perfluorooctanoic Acid (PFOA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Biota - Relative Percentage Differences

AECOM

Lab Report Number	ES2203382	ES2203382		ES2203382	ES2203382	
Field ID	1302_BIOAFA237_211124	1302_QC135_211124	**RPD**	1302_BIOAFA238_211124	1302_QC136_211124	**RPD**
Matrix	Biota	Biota		Biota	Biota	
Sample Type	Primary	Intra-lab Duplicate/Split		Primary	Intra-lab Duplicate/Split	
Date	24/11/2021	24/11/2021		24/11/2021	24/11/2021	
Analyte	**Units**	**LOR**						
PFAS Full Suite								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorobutanoic acid (PFBA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorononanoic acid (PFNA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
PFOS - Branched	mg/kg	0.001	0.001	<0.001	0	<0.001	<0.001	0
PFOS - Linear	mg/kg	0.001	0.001	0.002	67	<0.001	0.001	0
Sum of PFAS	mg/kg	0.001	0.002	0.002	0	<0.001	0.001	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.001	0.002	0.002	0	<0.001	0.001	0
Perfluorooctanoic Acid (PFOA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Biota - Relative Percentage Differences

AECOM

Lab Report Number	ES2203382	ES2203382		ES2203382	ES2203382	
Field ID	1302_BIOAFA239_211124	1302_QC137_211124	**RPD**	1302_BIOAFA240_211124	1302_QC138_211124	**RPD**
Matrix	Biota	Biota		Biota	Biota	
Sample Type	Primary	Intra-lab Duplicate/Split		Primary	Intra-lab Duplicate/Split	
Date	24/11/2021	24/11/2021		24/11/2021	24/11/2021	

Analyte	**Units**	**LOR**						
PFAS Full Suite								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorobutanoic acid (PFBA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorononanoic acid (PFNA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
PFOS - Branched	mg/kg	0.001	<0.001	<0.001	0	0.001	0.001	0
PFOS - Linear	mg/kg	0.001	<0.001	<0.001	0	0.006	0.004	40
Sum of PFAS	mg/kg	0.001	<0.001	<0.001	0	0.01	0.008	22
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.001	<0.001	<0.001	0	0.007	0.005	33
Perfluorooctanoic Acid (PFOA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.001	<0.001	<0.001	0	0.003	0.003	0

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Water - Relative Percentage Differences

AECOM

Lab Report Number		ES2203382	ES2203382		ES2201342	ES2201342		ES2201342	RN1340447		ES2201342	ES2201342	
Field ID		1302_SW013_211203	1302_QC130_211203	**RPD**	1302_SW170_220113	1302_QC100_220113	**RPD**	1302_SW170_220113	1302_QC200_220113	**RPD**	1302_SW106_220114	1302_QC101_220114	**RPD**
Matrix		Water	Water		Water	Water		Water	Water		Water	Water	
Sample Type		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Intra-lab Duplicate	
Date		3/12/2021	3/12/2021		13/01/2022	13/01/2022		13/01/2022	13/01/2022		14/01/2022	14/01/2022	
Analyte	**Units**	**LOR**											
PFAS Full Suite													
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	0.03	0.03	0
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	0.04	0.04	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	0.02	<0.02	0	0.02	0.01	67	0.04	0.04	0
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	0.03	0.03	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Sum of PFAS	µg/L	0.01	0.07	0.06	15	0.59	0.51	15	**0.59**	**0.281**	**70**	0.95	1	5
Sum of PFHxS and PFOS	µg/L	0.01	0.07	0.06	15	0.57	0.51	11	**0.57**	**0.271**	**71**	0.81	0.86	6
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	0.04	0.04	0	0.42	0.37	13	**0.42**	**0.19**	**75**	0.54	0.59	9
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.03	0.02	40	0.15	0.14	7	**0.15**	**0.081**	**60**	0.27	0.27	0

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Water - Relative Percentage Differences

AECOM

Lab Report Number			ES2201342	RN1340447		ES2201342	ES2201342		ES2208419	ES2208419		ES2208419	RN1346368	
Field ID			1302_SW106_220114	1302_QC201_220117	**RPD**	1302_SW152_220117	1302_QC102_220117	**RPD**	1302_MW128_220307	1302_QC100_220307	**RPD**	1302_MW128_220307	1302_QC200_220307	**RPD**
Matrix			Water	Water		Water	Water		Water	Water		Water	Water	
Sample Type			Primary	Inter-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Inter-lab Duplicate	
Date			14/01/2022	14/01/2022		17/01/2022	17/01/2022		7/03/2022	7/03/2022		7/03/2022	7/03/2022	
Analyte	**Units**	**LOR**												
PFAS Full Suite														
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.03	<0.01	100	<0.02	<0.02	0	0.15	0.16	6	0.15	0.14	7
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	0.052	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	0.04	<0.01	120	<0.02	<0.02	0	0.1	0.1	0	0.1	0.088	13
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	0.04	0.04	0	0.04	0.045	12
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.04	<0.01	120	<0.02	<0.02	0	0.4	0.4	0	0.4	0.31	25
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.03	<0.01	100	<0.02	<0.02	0	0.17	0.17	0	0.17	0.14	19
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	0.08	0.09	12	0.08	0.082	2
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0
Sum of PFAS	µg/L	0.01	**0.95**	**0.16**	**134**	0.22	0.23	4	6.63	6.72	1	**6.63**	**4.627**	**35**
Sum of PFHxS and PFOS	µg/L	0.01	**0.81**	**0.16**	**134**	0.22	0.23	4	5.59	5.66	1	**5.59**	**3.68**	**41**
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	**0.54**	**0.13**	**122**	0.18	0.19	5	4	4.09	2	**4**	**2.7**	**39**
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.1	0.1	0	0.1	0.09	11
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	**0.27**	**0.03**	**160**	0.04	0.04	0	1.59	1.57	1	**1.59**	**0.98**	**47**

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Water - Relative Percentage Differences

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Lab Report Number			ES2208419	ES2208419		ES2208419	ES2208419		ES2208419	RN1346368		ES2208419	ES2208419	
Field ID			1302_MW303_220308	1302_QC101_220308	**RPD**	1302_MW241_220309	1302_QC102_220309	**RPD**	1302_MW241_220309	1302_QC201_220309	**RPD**	1302_MW141_220309	1302_QC103_220309	**RPD**
Matrix			Water	Water		Water	Water		Water	Water		Water	Water	
Sample Type			Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Intra-lab Duplicate	
Date			8/03/2022	8/03/2022		9/03/2022	9/03/2022		9/03/2022	9/03/2022		9/03/2022	9/03/2022	
Analyte	**Units**	**LOR**												
PFAS Full Suite														
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	0.06	18	0.37	0.36	3	0.37	0.35	6	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	1.32	1.26	5	**1.32**	**0.75**	**55**	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	1.62	1.99	20	1.21	1.24	2	**1.21**	**0.65**	**60**	<0.02	<0.02	0
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	0.3	0.4	29	1.2	1.2	0	1.2	0.9	29	<0.1	<0.1	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	0.09	0.08	12	0.09	0.098	9	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	1.05	1.24	17	0.69	0.66	4	**0.69**	**0.49**	**34**	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	0.35	0.39	11	2.3	2.36	3	2.3	1.8	24	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	3.54	4.11	15	5.59	5.53	1	**5.59**	**2.4**	**80**	<0.02	<0.02	0
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	0.8	0.77	4	0.8	0.77	4	<0.02	<0.02	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	2.1	2.54	19	0.8	0.8	0	0.8	0.94	16	<0.02	<0.02	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	0.53	0.63	17	2.47	2.47	0	**2.47**	**1.3**	**62**	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Sum of PFAS	µg/L	0.01	42.1	45.1	7	45.2	44.4	2	**45.2**	**171.1**	**189**	0.29	0.33	13
Sum of PFHxS and PFOS	µg/L	0.01	31.8	32.9	3	25.3	24.6	3	**25.3**	**15.9**	**45**	0.29	0.33	13
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	18.8	19.1	2	19	18.3	4	**19**	**12**	**45**	0.13	0.15	14
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.77	0.84	9	3.1	3.07	1	**3.1**	**1.7**	**58**	<0.01	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	13	13.8	6	6.3	6.26	1	**6.3**	**3.9**	**47**	0.16	0.18	12

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

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Water - Relative Percentage Differences

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Lab Report Number			ES2209679	ES2209679		ES2209679	RN1348951		ES2209679	ES2209679		ES2209679	RN1348951	
Field ID			1302_SW170_220314	1302_QC100_220314	**RPD**	1302_SW170_220314	1302_QC200_220314	**RPD**	1302_SW168_220315	1302_QC101_220315	**RPD**	1302_SW106_220315	1302_QC201_220315	**RPD**
Matrix			Water	Water		Water	Water		Water	Water		Water	Water	
Sample Type			Primary	Intra-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Inter-lab Duplicate	
Date			14/03/2022	14/03/2022		14/03/2022	14/03/2022		15/03/2022	15/03/2022		15/03/2022	15/03/2022	
Analyte	**Units**	**LOR**												
PFAS Full Suite														
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	0.011	0	0.05	0.05	0	0.03	0.019	45
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<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 (Interlab)	<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 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<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 (Interlab)	<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 (Interlab)	0.04	0.04	0	0.04	0.02	67	0.12	0.11	9	0.06	0.048	22
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<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 (Interlab)	<0.02	<0.02	0	<0.02	0.011	0	0.04	0.05	22	0.02	0.02	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	0.03	0.03	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Sum of PFAS	µg/L	0.01	0.52	0.53	2	**0.52**	**0.322**	**47**	1.07	1.04	3	**0.66**	**1.008**	**41**
Sum of PFHxS and PFOS	µg/L	0.01	0.48	0.49	2	**0.48**	**0.28**	**52**	0.77	0.76	1	**0.54**	**0.91**	**51**
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	0.33	0.34	3	**0.33**	**0.18**	**59**	0.47	0.46	2	**0.34**	**0.67**	**65**
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.04	0.04	0	0.01	0.011	10
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.15	0.15	0	0.15	0.1	40	0.3	0.3	0	0.2	0.24	18

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

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Water - Relative Percentage Differences

AECOM

Lab Report Number	ES2211499	ES2211499		ES2211499	EB2209445		
Field ID	1302_SW109_220401	1302_QC100_220401	**RPD**	1302_SW109_220401	1302_QC200_220401	**RPD**	
Matrix	Water	Water		Water	Water		
Sample Type	Primary	Intra-lab Duplicate		Primary	Inter-lab Duplicate		
Date	1/04/2022	1/04/2022		1/04/2022	1/04/2022		

Analyte	**Units**	**LOR**						
PFAS Full Suite								
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.03	0.03	0	0.03	0.03	0
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	0.02	<0.02	0	0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.08	0.08	0	0.08	0.07	13
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.04	0.03	29	0.04	0.04	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Sum of PFAS	µg/L	0.01	1.04	0.95	9	1.04	1.03	1
Sum of PFHxS and PFOS	µg/L	0.01	0.85	0.79	7	0.85	0.87	2
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	0.53	0.52	2	0.53	0.57	7
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.02	0.02	0	0.02	0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.32	0.27	17	0.32	0.3	6

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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 E

Chain of Custody

Appendix E Chain of Custody

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
MOUNT ISA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7555 E: samples.perth@alsglobal.com
SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g.. Ultra Trace Organics)	⊠ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle):
OFFICE: [redacted]		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: ~~NT_PFAS_2022~~ NT_PFASOMP	ALS QUOTE NO.: ~~SY/159/19V2~~ SY/159/19V3	COC SEQUENCE NUMBER (Circle)	Free Ice / frozen ice bricks present upon receipt? Yes / No / N/A
ORDER NUMBER: 60612561 4.1	Invoicing : ~~60612561~~ 60612561 4.1	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: 19.4 °C
PROJECT MANAGER: [redacted]	CONTACT PH:	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: [redacted]	SAMPLER MOBILE: [redacted]		
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):		

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
[redacted]	[redacted]		JV/B
DATE/TIME: 01/04/22	DATE/TIME: 1/4/22 11:20	DATE/TIME:	DATE/TIME: 5/4/22 8:45

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X	Suspended Solids - EA025H	Cations/ Anions - NT-01&02A	TRH/BTEXN/8 metals - W-05	8 Dissolved Metals - W-02	Additional metal (Fe) - EG020	MNA - W-28	Explosives - EP203SL	Tributyltin	VOC trip blank - W18	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	1302_SW300_220401	01/04/22 10:35	W	P	2	✓										
	1302_SW170_220401	09:50	W		2	✓										
	1302_SW109_220401	11:05	W		2	✓										
	1302_QC100_220401	11:00	W		2	✓										
	1302_QC200_220401	[illegible]	W		[illegible]	✓										Refer to BNLS_405
	1302_QC300_220401	10:55	W		2	✓										
	1302_QC400_220401	10:55	W		2	✓										
	1302_QC500_220401	07:00	W		2	✓										
			W													
			W													
			W													
			W													
				TOTAL	17											

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = F
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Environmental Division
Brisbane
Work Order Reference
EB2209445

Telephone : +61-7-3243 7222

CHAIN OF CUSTODY

COC#: 32344 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 18.01.22 7.30am	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_RAAF_Darwin_PFASOMP

SITE: 1302_RAAF_Darwin

ORDER NO:

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	PFAS_Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1302_SW170_220113		13/01/2022 02:14 PM	Water	ALS: 2 Non ALS: 0	No	X		
002	1302_QC100_220113		13/01/2022 02:16 PM	Water	ALS: 2 Non ALS: 0	No	X		
003	1302_QC200_220113		13/01/2022 02:22 PM	Water	ALS: 3 Non ALS: 0	No	X		Pls fed to NML extra vol for lab QC
004	1302_SW162_220113		13/01/2022 03:11 PM	Water	ALS: 2 Non ALS: 0	No	X		
005	1302_QC300_220113		13/01/2022 03:14 PM	Water	ALS: 2 Non ALS: 0	No	X		
006	1302_QC400_220113		13/01/2022 03:15 PM	Water	ALS: 2 Non ALS: 0	No	X		
007	1302_SW109_220113		13/01/2022 04:51 PM	Water	ALS: 2 Non ALS: 0	No	X		
008	1302_SW108_220113		13/01/2022 05:10 PM	Water	ALS: 2 Non ALS: 0	No	X		
009	1302_SW168_220113		13/01/2022 05:23 PM	Water	ALS: 2 Non ALS: 0	No	X		

Subcon / Forward Lab / Split WO

Lab / Analysis:

Organised By / Date: NMI

Relinquished By / Date: QC200

Connote / Courier: QC201

WO No: ES2201342

Attach By PO / Internal Sheet:

Environmental Division
Sydney
Work Order Reference
ES2201342

Telephone : +61-2-8784 8555

CHAIN OF CUSTODY

COC#: 32344 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 18.01.22 7:30 AM	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_RAAF_Darwin_PFASOMP

SITE: 1302_RAAF_Darwin

ORDER NO:

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	PFAS_Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	1302_SW112_220114		14/01/2022 11:42 AM	Water	ALS: 2 Non ALS: 0	No	X		
011	1302_SW113_220114		14/01/2022 11:54 AM	Water	ALS: 2 Non ALS: 0	No	X		
012	1302_SW115_220114		14/01/2022 09:32 AM	Water	ALS: 2 Non ALS: 0	No	X		
013	1302_SW106_220114		14/01/2022 09:56 AM	Water	ALS: 2 Non ALS: 0	No	X		
014	1302_QC101_220114		14/01/2022 09:57 AM	Water	ALS: 2 Non ALS: 0	No	X		
015	1302_QC301_220114		14/01/2022 10:03 AM	Water	ALS: 2 Non ALS: 0	No	X		
016	1302_QC401_220114		14/01/2022 10:04 AM	Water	ALS: 2 Non ALS: 0	No	X		
017	1302_SW114_220114		14/01/2022 11:01 AM	Water	ALS: 2 Non ALS: 0	No	X		
018	1302_SW104_220114		14/01/2022 11:15 AM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 32344 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 18.01.22 7.30am	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_RAAF_Darwin_PFASOMP

SITE: 1302_RAAF_Darwin

ORDER NO:

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	PFAS_Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	1302_SW120_220114		14/01/2022 12:16 PM	Water	ALS: 2 Non ALS: 0	No	X		
020	1302_SW124_220114		14/01/2022 12:36 PM	Water	ALS: 2 Non ALS: 0	No	X		
021	1302_SW125_220114		14/01/2022 12:58 PM	Water	ALS: 2 Non ALS: 0	No	X		
022	1302_SW132_220114		14/01/2022 02:40 PM	Water	ALS: 2 Non ALS: 0	No	X		
023	1302_SW133_220114		14/01/2022 03:10 PM	Water	ALS: 2 Non ALS: 0	No	X		
024	1302_SW143_22011		14/01/2022 03:31 PM	Water	ALS: 2 Non ALS: 0	No	X		
025	1302_SW178_220117		17/01/2022 02:10 PM	Water	ALS: 2 Non ALS: 0	No	X		
026	1302_SW181_220117		17/01/2022 02:20 PM	Water	ALS: 2 Non ALS: 0	No	X		
027	1302_QC302_220117		17/01/2022 02:26 PM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 32344 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 18-01-22 7.30am	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_RAAF_Darwin_PFASOMP

SITE: 1302_RAAF_Darwin

ORDER NO:

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	PFAS_Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	1302_QC402_220117		17/01/2022 02:27 PM	Water	ALS: 2 Non ALS: 0	No	X		
029	1302_SW160_220117		17/01/2022 02:45 PM	Water	ALS: 2 Non ALS: 0	No	X		
030	1302_SW156_220117		17/01/2022 03:03 PM	Water	ALS: 2 Non ALS: 0	No	X		
031	1302_SW152_220117		17/01/2022 03:46 PM	Water	ALS: 2 Non ALS: 0	No	X		
032	1302_QC102_220117		17/01/2022 03:47 PM	Water	ALS: 2 Non ALS: 0	No	X		
033	1302_QC201_220117		17/01/2022 03:48 PM	Water	ALS: 3 Non ALS: 0	No	X		Please forward to NMI. Additional volume for lab qc

extra 34 QC500 No date w PFAS

CHAIN OF CUSTODY

COC#: 32344 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY: [redacted]	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 18.01.22 7.30am	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_RAAF_Darwin_PFASOMP

SITE: 1302_RAAF_Darwin

ORDER NO:

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	1302_SW170_220113	HDPE (no PTFE)	20 mL	00352010028416	Grey	No	
001	1302_SW170_220113	HDPE (no PTFE)	20 mL	00352010028385	Grey	No	
002	1302_QC100_220113	HDPE (no PTFE)	20 mL	00352010027895	Grey	No	
002	1302_QC100_220113	HDPE (no PTFE)	20 mL	00352010028443	Grey	No	
003	1302_QC200_220113	HDPE (no PTFE)	125 mL	00350719054404	Grey	No	
003	1302_QC200_220113	HDPE (no PTFE)	20 mL	00352010028358	Grey	No	
003	1302_QC200_220113	HDPE (no PTFE)	20 mL	00352010028343	Grey	No	
004	1302_SW162_220113	HDPE (no PTFE)	20 mL	00352010027985	Grey	No	
004	1302_SW162_220113	HDPE (no PTFE)	20 mL	00352010028069	Grey	No	
005	1302_QC300_220113	HDPE (no PTFE)	20 mL	00352010028439	Grey	No	
005	1302_QC300_220113	HDPE (no PTFE)	20 mL	00352010028450	Grey	No	
006	1302_QC400_220113	HDPE (no PTFE)	20 mL	00352010028293	Grey	No	
006	1302_QC400_220113	HDPE (no PTFE)	20 mL	00352010028383	Grey	No	
007	1302_SW109_220113	HDPE (no PTFE)	20 mL	00352005002055	Grey	No	
007	1302_SW109_220113	HDPE (no PTFE)	20 mL	00352005001942	Grey	No	
008	1302_SW108_220113	HDPE (no PTFE)	20 mL	00352005002068	Grey	No	
008	1302_SW108_220113	HDPE (no PTFE)	20 mL	00352005001987	Grey	No	
009	1302_SW168_220113	HDPE (no PTFE)	20 mL	00352005002105	Grey	No	
009	1302_SW168_220113	HDPE (no PTFE)	20 mL	00352005002060	Grey	No	
010	1302_SW112_220114	HDPE (no PTFE)	20 mL	00352010028221	Grey	No	
010	1302_SW112_220114	HDPE (no PTFE)	20 mL	00352010027877	Grey	No	
011	1302_SW113_220114	HDPE (no PTFE)	20 mL	00352010028167	Grey	No	
011	1302_SW113_220114	HDPE (no PTFE)	20 mL	00352010028405	Grey	No	
012	1302_SW115_220114	HDPE (no PTFE)	20 mL	00352005002094	Grey	No	
012	1302_SW115_220114	HDPE (no PTFE)	20 mL	00352005002041	Grey	No	
013	1302_SW106_220114	HDPE (no PTFE)	20 mL	00350019180755	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 32344 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_RAAF_Darwin_PFASOMP

SITE: 1302_RAAF_Darwin

ORDER NO:

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 18.01.22 7.30 Am	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:

013	1302_SW106_220114	HDPE (no PTFE)	20 mL	00350019180811	Grey	No	
014	1302_QC101_220114	HDPE (no PTFE)	20 mL	00352010028085	Grey	No	
014	1302_QC101_220114	HDPE (no PTFE)	20 mL	00352010028098	Grey	No	
015	1302_QC301_220114	HDPE (no PTFE)	20 mL	00352010028187	Grey	No	
015	1302_QC301_220114	HDPE (no PTFE)	20 mL	00352010028454	Grey	No	
016	1302_QC401_220114	HDPE (no PTFE)	20 mL	00352010028452	Grey	No	
016	1302_QC401_220114	HDPE (no PTFE)	20 mL	00352010028423	Grey	No	
017	1302_SW114_220114	HDPE (no PTFE)	20 mL	00350019180523	Grey	No	
017	1302_SW114_220114	HDPE (no PTFE)	20 mL	00350019180593	Grey	No	
018	1302_SW104_220114	HDPE (no PTFE)	20 mL	00352005001963	Grey	No	
018	1302_SW104_220114	HDPE (no PTFE)	20 mL	00352005002051	Grey	No	
019	1302_SW120_220114	HDPE (no PTFE)	20 mL	00352005002052	Grey	No	
019	1302_SW120_220114	HDPE (no PTFE)	20 mL	00352005001837	Grey	No	
020	1302_SW124_220114	HDPE (no PTFE)	20 mL	00350019180189	Grey	No	
020	1302_SW124_220114	HDPE (no PTFE)	20 mL	00350019179973	Grey	No	
021	1302_SW125_220114	HDPE (no PTFE)	20 mL	00352005002012	Grey	No	
021	1302_SW125_220114	HDPE (no PTFE)	20 mL	00352005001998	Grey	No	
022	1302_SW132_220114	HDPE (no PTFE)	20 mL	00350019180733	Grey	No	
022	1302_SW132_220114	HDPE (no PTFE)	20 mL	00350019180624	Grey	No	
023	1302_SW133_220114	HDPE (no PTFE)	20 mL	00352010028431	Grey	No	
023	1302_SW133_220114	HDPE (no PTFE)	20 mL	00352010028003	Grey	No	
024	1302_SW143_22011	HDPE (no PTFE)	20 mL	00352010027938	Grey	No	
024	1302_SW143_22011	HDPE (no PTFE)	20 mL	00352010028430	Grey	No	
025	1302_SW178_220117	HDPE (no PTFE)	20 mL	00352005001838	Grey	No	
025	1302_SW178_220117	HDPE (no PTFE)	20 mL	00352005001907	Grey	No	
026	1302_SW181_220117	HDPE (no PTFE)	20 mL	00352005002033	Grey	No	
026	1302_SW181_220117	HDPE (no PTFE)	20 mL	00352005002046	Grey	No	

CHAIN OF CUSTODY

COC#: 32344 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY: [redacted]	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 18.01.22 7.30 AM	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_RAAF_Darwin_PFASOMP

SITE: 1302_RAAF_Darwin

ORDER NO:

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:

027	1302_QC302_220117	HDPE (no PTFE)	20 mL	00352010027861	Grey	No	
027	1302_QC302_220117	HDPE (no PTFE)	20 mL	00352010028054	Grey	No	
028	1302_QC402_220117	HDPE (no PTFE)	20 mL	00352010028348	Grey	No	
028	1302_QC402_220117	HDPE (no PTFE)	20 mL	00352010028119	Grey	No	
029	1302_SW160_220117	HDPE (no PTFE)	20 mL	00352005001951	Grey	No	
029	1302_SW160_220117	HDPE (no PTFE)	20 mL	00352005001946	Grey	No	
030	1302_SW156_220117	HDPE (no PTFE)	20 mL	00350019180549	Grey	No	
030	1302_SW156_220117	HDPE (no PTFE)	20 mL	00350019180625	Grey	No	
031	1302_SW152_220117	HDPE (no PTFE)	20 mL	00352010028315	Grey	No	
031	1302_SW152_220117	HDPE (no PTFE)	20 mL	00352010028269	Grey	No	
032	1302_QC102_220117	HDPE (no PTFE)	20 mL	00352010027935	Grey	No	
032	1302_QC102_220117	HDPE (no PTFE)	20 mL	00352010028018	Grey	No	
033	1302_QC201_220117	HDPE (no PTFE)	20 mL	00352010028271	Grey	No	
033	1302_QC201_220117	HDPE (no PTFE)	20 mL	00352010028435	Grey	No	
033	1302_QC201_220117	HDPE (no PTFE)	125 mL	00350719054817	Grey	No	

Total Bottle Count: ALS: 68, Non ALS: 0

ALSCompass
SAMPLING Intelligence

ALS Use Only

Custody Document for Submissions via ALS Compass App

Project: 60612561 Client: AECOM Project Manager: [redacted]

Phone: (

ALS Compass COC Reference: 32344 # Samples: 33 Sampler: [redacted]

ES2201342 Phone: (

Turnaround Requirements: Standard X Urgent

Special Instructions:	ALS Use Only			
	Custody seal intact?	YES	NO	N/A
	Free ice / frozen ice bricks upon receipt?	YES	NO	N/A
	Random sample temperature on receipt?		°C	

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / T 17/1/22 2:50 pm	Date / Time: 17/01/22 2:50pm	Date / Time:	Date / Time:

AECOM

0990 PAGE 1 of 6 Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
[redacted]

Laboratory Details
Lab. Name: ALS
Lab. Address: [redacted]
Contact Name: [redacted]
Lab. Ref:

Tel: [redacted]
Fax:
Preliminary Report by:
Final Report by:

Environmental Division Sydney
Work Order Reference
ES2203382

Telephone : +61-2-8784 8555

Sampled By: [redacted]

Project Name: NT_1302_PFASOMP

AECOM Project #: 60612561

Purchase

Specifications: Please report in ESdat format **RE-FREEZE BIOTA SAMPLES**

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT *Guarantee Required?*	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	Y

6. Report Format: ESdat 7. Project Manager:

Analysis Re

Lab. ID	Sample ID	Sampling Date	Matrix			Preservation				Container (No. & type)	HOLD	Notes
			biota	water		filt'ed	acid	ice	frozen			
1	1302_BIOAFA204_211108	08 Nov 2021	X						X	Snap bag	X	Frozen
2	1302_BIOAFA205_211108	08 Nov 2021	X						X	Snap bag	X	Frozen
3	1302_BIOAFA206_211108	08 Nov 2021	X						X	Snap bag	X	Frozen
4	1302_BIOAFA207_211108	08 Nov 2021	X						X	Snap bag	X	Frozen
5	1302_BIOAFA208_211108	08 Nov 2021	X						X	Snap bag	X	Frozen
6	1302_BIOAFA209_211113	13 Nov 2021	X						X	Snap bag	X	Frozen
7	1302_BIOAFA210_211113	13 Nov 2021	X						X	Snap bag	X	Frozen
8	1302_BIOAFA211_211113	13 Nov 2021	X						X	Snap bag	X	Frozen
9	1302_BIOAFA212_211114	14 Nov 2021	X						X	Snap bag	X	Frozen
10	1302_BIOAFA213_211114	14 Nov 2021	X						X	Snap bag	X	Frozen
11	1302_BIOAFA214_211114	14 Nov 2021	X						X	Snap bag	X	Frozen
12	1302_BIOAFA215_211112	12 Nov 2021	X						X	Snap bag	X	Frozen
13	1302_BIOAFA216_211112	12 Nov 2021	X						X	Snap bag	X	Frozen
14	1302_BIOAFA217_211112	12 Nov 2021	X						X	Snap bag	X	Frozen

Comments: **Please send ESdat files to DERP.labreports@esdat.com.au and ensure that the files use the PROJECT NAME**

Temp. received: °C

Report & invoice: APCORP.ANZ@aecom.com

Lab Report No Esky ID

Relinquished by: [redacted] Signed: Date:

Received by: Signed: Date:

Relinquished by: [redacted] Date:

Received by: Date:

AECOM

 Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
[redacted]

Laboratory Details
Lab. Name: ALS
[redacted]
Lab. Ref:

Tel: [redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

Sampled By: [redacted]

Project Name: NT_1302_PFASOMP

AECOM Project #: 60612561

Purchase Order No:

Specifications: Please report in ESdat format — **RE-FREEZE BIOTA SAMPLES**

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	Y

6. Report Format: ESdat — 7. Project Manager:

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Matrix:	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	HOLD	Notes
15	1302_BIOAFA218_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
16	1302_BIOAFA219_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
17	1302_BIOAFA220_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
18	1302_BIOAFA221_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
19	1302_BIOAFA222_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
20	1302_BIOAFA223_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
21	1302_BIOAFA224_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
22	1302_BIOAFA225_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
23	1302_BIOAFA226_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
24	1302_BIOAFA227_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
25	1302_BIOAFA228_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
26	1302_BIOAFA229_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
27	1302_BIOAFA230_211203	03 Dec 2021	X						X	Snap bag	X	Frozen
28	1302_BIOAFA231_211203	03 Dec 2021	X						X	Snap bag	X	Frozen

Comments: **Please send ESdat files to DERP.labreports@esdat.com.au and ensure that the files use the PROJECT NAME**

Temp. received: °C

Report & invoice: APCORP.ANZ@aecom.com

Lab Report No | Esky ID

Relinquished by: [redacted] Signed: [redacted] Date: 27/01/2022

Received by: Signed: Date: 27/1/22

Relinquished by: Signed: Date:

Received by: Signed: Date:

FAST

AECOM **0990 PAGE 3 of 6** Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
[redacted]

Laboratory Details
Lab. Name: ALS
[redacted]
Lab. Ref:

Tel: [redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

Sampled By: [redacted] **Project Name: NT_1302_PFASOMP** **AECOM Project #: 60612561** **Purchase Order No:**

Specifications: Please report in ESdat format **RE-FREEZE BIOTA SAMPLES**

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	Y

6. Report Format: ESdat 7. Project Manager:

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	Analysis Request: QTOH	Notes
29	1302_BIOAFA232_211203	03 Dec 2021	X					X	Snap bag	X	Frozen
30	1302_BIOAFA233_211203	03 Dec 2021	X					X	Snap bag	X	Frozen
31	1302_BIOAFA234_211203	03 Dec 2021	X					X	Snap bag	X	Frozen
32	1302_BIOAFA235_211203	03 Dec 2021	X					X	Snap bag	X	Frozen
33	1302_BIOAFA236_211203	03 Dec 2021	X					X	Snap bag	X	Frozen
34	1302_BIOAFA237_211124	24 Nov 2021	X					X	Snap bag	X	Frozen
35	1302_BIOAFA238_211124	24 Nov 2021	X					X	Snap bag	X	Frozen
36	1302_BIOAFA239_211124	24 Nov 2021	X					X	Snap bag	X	Frozen
37	1302_BIOAFA240_211124	24 Nov 2021	X					X	Snap bag	X	Frozen
38	1302_BIOAFA241_211124	24 Nov 2021	X					X	Snap bag	X	Frozen
39	1302_BIOAFA242_211124	24 Nov 2021	X					X	Snap bag	X	Frozen
40	1302_BIOAFA243_211124	24 Nov 2021	X					X	Snap bag	X	Frozen
41	1302_BIOAFA244_211124	24 Nov 2021	X					X	Snap bag	X	Frozen
42	1302_BIOAFA245_211124	24 Nov 2021	X					X	Snap bag	X	Frozen

Comments: **Please send ESdat files to DERP.labreports@esdat.com.au and ensure that the files use the PROJECT NAME** Temp. received: °C **Report & invoice:** APCORP.ANZ@aecom.com Lab Report No. Esky ID

Relinquished by: [redacted]	Signed: [redacted]	Date: 27/01/2022	Relinquished by:	Signed:	Date:
Received by:	Signed:	Date:	Received by:	Signed:	Date:

FAN. 2/2/22 a

AECOM **0990 PAGE 4 of 6** **Chain of Custody**

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
[redacted]

Laboratory Details
Lab. Name: ALS
[redacted]
Lab. Ref:

Tel: [redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

Sampled By: [redacted] **Project Name: NT_1302_PFASOMP** **AECOM Project #: 60612561** **Purchase Order No:**

Specifications: Please report in ESdat format **RE-FREEZE BIOTA SAMPLES**

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	Y

6. Report Format: ESdat 7. Project Manager:

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Matrix:	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	HOLD	Notes
43	1302_BIOAFA246_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
44	1302_BIOAFA247_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
45	1302_BIOAFA248_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
46	1302_BIOAFA249_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
47	1302_BIOAFA250_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
48	1302_BIOAFA251_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
49	1302_BIOAFA252_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
50	1302_BIOAFA253_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
51	1302_BIOAFA254_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
52	1302_BIOAFA255_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
53	1302_BIOAFA256_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
54	1302_BIOAFA257_211124	24 Nov 2021	X						X	Snap bag	X	Frozen

Comments: **Please send ESdat files to DERP.labreports@esdat.com.au and ensure that the files use the PROJECT NAME**

Temp. received: °C

Report & invoice: APCORP.ANZ@aecom.com

Lab Report No/Esky ID

Relinquished by: [redacted] Signed: [redacted] Date: 27/01/2022

Received by: Signed: Date:

Relinquished by: Signed: Date:

Received by: Signed: Date:

FMD

2/2/22

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AECOM

0990 PAGE 5 of 6 Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230

[redacted]

Laboratory Details
Lab. Name: ALS
[redacted]
Lab. Ref:

Tel: [redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

Sampled By: [redacted]

Project Name: NT_1302_PFASOMP

AECOM Project #: 60612561

Purchase Order No:

Specifications: Please report in ESdat format — **RE-FREEZE BIOTA SAMPLES**

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	Y

6. Report Format: ESdat — 7. Project Manager:

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water		Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	HOLD	Notes
55	1302_QC130_211203	03 Dec 2021		X				X		Bottle	X	Surface Water
56	1302_QC131_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
57	1302_QC132_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
58	1302_QC133_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
59	1302_QC134_211125	25 Nov 2021	X						X	Snap bag	X	Frozen
60	1302_QC135_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
61	1302_QC136_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
62	1302_QC137_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
63	1302_QC138_211124	24 Nov 2021	X						X	Snap bag	X	Frozen
64	1302_QC303_220127	27 Jan 2022		X				X		Bottle	X	Rinsate
65	1302_QC503_211115	15 Nov 2021		X				X		Bottle x 2	X	Trip Blank

Comments: **Please send ESdat files to DERP.labreports@esdat.com.au and ensure that the files use the PROJECT NAME**

Temp. received: °C

Report & invoice: APCORP.ANZ@aecom.com

Lab Report No: Esky ID:

Relinquished by: [redacted]	Signed: [redacted]	Date: 27/01/2022	Relinquished by:	Signed:	Date:
Received by:	Signed:	Date:	Received by:	Signed:	Date:

FAN

4/1/22

a

AECOM

0990 PAGE 6 of 6 Chain of Custody

AECOM Australia Pty Ltd
Level 21, 420 George Street
Sydney, NSW, 2000
PO Box Q410, QVB PO, Sydney, NSW, 1230
[redacted]

Laboratory Details
Lab. Name: ALS
[redacted]
Lab. Ref:

Tel: [redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

Sampled By: [redacted]

Project Name: NT_1302_PFASOMP

AECOM Project #: 60612561

Purchase Order No:

Specifications: Please report in ESdat format **KEEP COOL**

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	Y

6. Report Format: ESdat

7. Project Manager:

Lab. ID	Sample ID	Sampling Date	Matrix			Preservation				Container (No. & type)	Analysis Request HOLD	Notes
			biota	water		filt'ed	acid	ice	frozen			
66	1302_SW013_211203	03 Dec 2021		X				X		Bottle	X	Surface Water
67	1302_SW014_211203	03 Dec 2021		X				X		Bottle	X	Surface Water
68	1302_SW015_211109	09 Nov 2021		X				X		Bottle	X	Surface Water
69	1302_SW016_211112	12 Nov 2021		X				X		Bottle	X	Surface Water
70	1302_SW017_211112	12 Nov 2021		X				X		Bottle	X	Surface Water
71	1302_SW018_211112	12 Nov 2021		X				X		Bottle	X	Surface Water

Comments: **Please send ESdat files to DERP.labreports@esdat.com.au and ensure that the files use the PROJECT NAME**

Temp. received: °C

Report & invoice: APCORP.ANZ@aecom.com

Lab Report No: Esky ID:

Relinquished by: [redacted] Signed: Date: 27/01/2022

Received by: [redacted] Signed: Date:

Relinquished by: Signed: Date:

Received by: Signed: Date:

FAN,

2/2/22

G

14.03.22

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ALS Environmental

ADELAIDE: 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

BRISBANE: 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE: 46 Callemondah Drive Clinton QLD 4680 Ph: 07 4971 9600 E: gladstone@alsglobal.com

MACKAY: 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

MELBOURNE: 24 Westfall Road Scoresby VIC 3179 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

MUDGEE: 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

NEWCASTLE: 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

NOWRA: 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com

PERTH: 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY: 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

TOWNSVILLE: 14-15 Desma Circuit Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

WOLLONGONG: 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	✱ Standard TAT (List due date):
OFFICE: Darwin		☐ Non Standard or urgent TAT (List due date):
PROJECT: NT_1302 ~~WQMP-22~~ PFASOMP	ALS QUOTE NO.: ~~SY-478-20-B-v2~~	SY/139/19 V3
ORDER NUMBER: 60612561	Invoicing: ~~80075609~~	60612561 1 4.1
PROJECT MANAGER: James Guzman	CONTACT PH:	

COC SEQUENCE NUMBER (Circle)
COC: (1) 2 3 4 5 6 7
OF: (1) 2 3 4 5 6 7

FOR 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 comment:			

[redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
[redacted]	[redacted]		[redacted]
DATE/TIME: 3/3/22	DATE/TIME: 03/02/22 9:35	DATE/TIME:	DATE/TIME: 07.03.22 7.30am

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).											Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X	Suspended Solids - EA025H	Cations/ Anions - NT-01&02A	TRH/BTEX/8 metals - W-05	8 Dissolved Metals - W-02	Additional metal (Fe) - EG020	MNA - W-28	Explosives - EP203SL	Tributyltin	VOC trip blank - W18	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	1302_SW300_220302	2/3/22 1107	W	P	2	✓										
2	1302_SW109_220302	2/3/22 1149	W		2	✓										
3	1302_QC100_220302	" 1149	W		2	✓										
–	1302_QC200_220302	1149	W		4	✓										PCS FWD NMI
4	1302_QC400_220302		W		2	✓										
5	1302_QC500_220302		W		2	✓										
6	1302_SW170_220302	15:00	W		2	✓										
			W													
			W													
			W													
			W													
			W													
			W													
TOTAL					16											

Subcon / Forward Lab: Split WO
Lab / Analysis: NMI
Organised By / Date: QC 220
Relinquished By / Date: 3/3
Courier / Courier: EA220_3/3
WO No: ES2207387
Attach By: PO.B Internal Sheet:
COUNTRY OF ORIGIN: DARWIN

Environmental Division Sydney
Work Order Reference
ES2207387

Telephone : +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldo.
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

18.3.22

CHAIN OF CUSTODY

ALS COC#: 34744 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 11.03.22 1230pm	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 Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1302_MW128_220307		07/03/2022 01:56 PM	Water	ALS: 2 Non ALS: 0	No	X		
002	1302_QC400_220307		07/03/2022 01:57 PM	Water	ALS: 2 Non ALS: 0	No	X		
003	1302_QC200_220307		07/03/2022 01:58 PM	Water	ALS: 3 Non ALS: 0	No	X		Please fwd to NMI, extra lab qc included
004	1302_QC100_220307		07/03/2022 02:00 PM	Water	ALS: 2 Non ALS: 0	No	X		
005	1302_QC500_220307		07/03/2022 02:01 PM	Water	ALS: 2 Non ALS: 0	No	X		
006	1302_MW103_220307		07/03/2022 02:22 PM	Water	ALS: 2 Non ALS: 0	No	X		
007	1302_QC300_220307		07/03/2022 04:45 PM	Water	ALS: 2 Non ALS: 0	No	X		
008	1302_QC401_220308		08/03/2022 08:45 AM	Water	ALS: 2 Non ALS: 0	No	X		
009	1302_MW176_220308		08/03/2022 08:47 AM	Water	ALS: 2 Non ALS: 0	No	X		

Environmental Division
Sydney
Work Order Reference
ES2208419

Telephone : +61-2-8784 8555

Subcon: Forward Lab / Split WO
Lab / Analyser:
Organised By / Date: NMI
Relinquished By / Date: QC200
Connote / Courier: QC201
WO No: ES2208419
Attach By PO / Internal Sheet:

CHAIN OF CUSTODY

(ALS) COC#: 34744 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 11.03.22 12.30pm	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 Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	1302_MW200_220308		08/03/2022 09:03 AM	Water	ALS: 2 Non ALS: 0	No	X		
011	1302_MW211_220308		08/03/2022 09:16 AM	Water	ALS: 2 Non ALS: 0	No	X		
012	1302_MW180_220308		08/03/2022 09:29 AM	Water	ALS: 2 Non ALS: 0	No	X		
013	1302_MW201_220308		08/03/2022 09:59 AM	Water	ALS: 2 Non ALS: 0	No	X		
014	1302_MW452_220308		08/03/2022 10:10 AM	Water	ALS: 2 Non ALS: 0	No	X		
015	1302_MW451_220308		08/03/2022 10:19 AM	Water	ALS: 2 Non ALS: 0	No	X		
016	1302_QC301_220308		08/03/2022 10:27 AM	Water	ALS: 2 Non ALS: 0	No	X		
017	1302_MW133_220308		08/03/2022 11:59 AM	Water	ALS: 2 Non ALS: 0	No	X		
018	1302_MW303_220308		08/03/2022 01:14 PM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) *COC#:* 34744 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY: [redacted]	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 11.03.22 12.30pm	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 Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	1302_QC101_220308		08/03/2022 01:15 PM	Water	ALS: 2 Non ALS: 0	No	X		
020	1302_MW297_220308		08/03/2022 01:56 PM	Water	ALS: 2 Non ALS: 0	No	X		
021	1302_MW185_220308		08/03/2022 04:02 PM	Water	ALS: 2 Non ALS: 0	No	X		
022	1302_MW195_220308		08/03/2022 04:20 PM	Water	ALS: 2 Non ALS: 0	No	X		
023	1302_MW194_220308		08/03/2022 04:32 PM	Water	ALS: 2 Non ALS: 0	No	X		
024	1302_MW190_220308		08/03/2022 04:43 PM	Water	ALS: 2 Non ALS: 0	No	X		
025	1302_MW191_220308		08/03/2022 04:54 PM	Water	ALS: 2 Non ALS: 0	No	X		
026	1302_MW210_220308		08/03/2022 05:12 PM	Water	ALS: 2 Non ALS: 0	No	X		
027	1302_MW209_220308		08/03/2022 05:28 PM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 34744 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 11.03.22 12-30pm	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	1302_MW107_220309		09/03/2022 10:09 AM	Water	ALS: 2 Non ALS: 0	No	X		
029	1302_QC402_220309		09/03/2022 10:28 AM	Water	ALS: 2 Non ALS: 0	No	X		
030	1302_MW421_220309		09/03/2022 10:29 AM	Water	ALS: 2 Non ALS: 0	No	X		
031	1302_QC102_220309		09/03/2022 10:30 AM	Water	ALS: 2 Non ALS: 0	No	X		
032	1302_QC201_220309		09/03/2022 10:31 AM	Water	ALS: 3 Non ALS: 0	No	X		Please forward to NMI Additional lab qc provided
033	1302_MW197_220309		09/03/2022 10:51 AM	Water	ALS: 2 Non ALS: 0	No	X		
034	1302_MW240_220309		09/03/2022 11:01 AM	Water	ALS: 2 Non ALS: 0	No	X		
035	1302_MW453_220309		09/03/2022 11:11 AM	Water	ALS: 2 Non ALS: 0	No	X		
036	1302_MW144_220309		09/03/2022 11:35 AM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 34744 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 11.03.22 12.30pm	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 Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
037	1302_MW141_220309		09/03/2022 11:55 AM	Water	ALS: 2 Non ALS: 0	No	X		
038	1302_QC103_220309		09/03/2022 11:56 AM	Water	ALS: 2 Non ALS: 0	No	X		
039	1302_MW139_220309		09/03/2022 12:10 PM	Water	ALS: 2 Non ALS: 0	No	X		
040	1302_MW422_220309		09/03/2022 12:20 PM	Water	ALS: 2 Non ALS: 0	No	X		
041	1302_MW454_220309		09/03/2022 12:25 PM	Water	ALS: 2 Non ALS: 0	No	X		
042	1302_MW112_220310		10/03/2022 10:02 AM	Water	ALS: 2 Non ALS: 0	No	X		
043	1302_QC403_220310		10/03/2022 10:03 AM	Water	ALS: 2 Non ALS: 0	No	X		
044	1302_MW205_220310		10/03/2022 10:21 AM	Water	ALS: 2 Non ALS: 0	No	X		
045	1302_MW115_220310		10/03/2022 10:27 AM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 34744 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 11.03.22 12:30pm	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
046	1302_MW156_220310		10/03/2022 10:50 AM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) *COC#:* 34744 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 11.03.22 12.30pm	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	1302_MW128_220307	HDPE (no PTFE)	20 mL	00352010028144	Grey	No	
001	1302_MW128_220307	HDPE (no PTFE)	20 mL	00352010027918	Grey	No	
002	1302_QC400_220307	HDPE (no PTFE)	20 mL	00352101042710	Grey	No	
002	1302_QC400_220307	HDPE (no PTFE)	20 mL	00352101042625	Grey	No	
003	1302_QC200_220307	HDPE (no PTFE)	20 mL	00350719054399	Grey	No	
003	1302_QC200_220307	HDPE (no PTFE)	20 mL	00352101042673	Grey	No	
003	1302_QC200_220307	HDPE (no PTFE)	20 mL	00352101042722	Grey	No	
004	1302_QC100_220307	HDPE (no PTFE)	20 mL	00352101042582	Grey	No	
004	1302_QC100_220307	HDPE (no PTFE)	20 mL	00352101042686	Grey	No	
005	1302_QC500_220307	HDPE (no PTFE)	20 mL	00352101042665	Grey	No	
005	1302_QC500_220307	HDPE (no PTFE)	20 mL	00352101042672	Grey	No	
006	1302_MW103_220307	HDPE (no PTFE)	20 mL	00352101042662	Grey	No	
006	1302_MW103_220307	HDPE (no PTFE)	20 mL	00352101042713	Grey	No	
007	1302_QC300_220307	HDPE (no PTFE)	20 mL	00352101042723	Grey	No	
007	1302_QC300_220307	HDPE (no PTFE)	20 mL	00352101042586	Grey	No	
008	1302_QC401_220308	HDPE (no PTFE)	20 mL	00352101042736	Grey	No	
008	1302_QC401_220308	HDPE (no PTFE)	20 mL	00352101042742	Grey	No	
009	1302_MW176_220308	HDPE (no PTFE)	20 mL	00352101042793	Grey	No	
009	1302_MW176_220308	HDPE (no PTFE)	20 mL	00352101042805	Grey	No	
010	1302_MW200_220308	HDPE (no PTFE)	20 mL	00352101042739	Grey	No	
010	1302_MW200_220308	HDPE (no PTFE)	20 mL	00352101042816	Grey	No	
011	1302_MW211_220308	HDPE (no PTFE)	20 mL	00352101042743	Grey	No	
011	1302_MW211_220308	HDPE (no PTFE)	20 mL	00352101042668	Grey	No	
012	1302_MW180_220308	HDPE (no PTFE)	20 mL	00352101042844	Grey	No	
012	1302_MW180_220308	HDPE (no PTFE)	20 mL	00352101042748	Grey	No	
013	1302_MW201_220308	HDPE (no PTFE)	20 mL	00352101042614	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 34744 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

PROJECT MANAGER: [redacted]
PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 11.03.22 12.30pm	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:

013	1302_MW201_220308	HDPE (no PTFE)	20 mL	00352101042719	Grey	No	
014	1302_MW452_220308	HDPE (no PTFE)	20 mL	00352101042584	Grey	No	
014	1302_MW452_220308	HDPE (no PTFE)	20 mL	00352101042684	Grey	No	
015	1302_MW451_220308	HDPE (no PTFE)	20 mL	00352101042741	Grey	No	
015	1302_MW451_220308	HDPE (no PTFE)	20 mL	00352101042849	Grey	No	
016	1302_QC301_220308	HDPE (no PTFE)	20 mL	00352101042819	Grey	No	
016	1302_QC301_220308	HDPE (no PTFE)	20 mL	00352101042774	Grey	No	
017	1302_MW133_220308	HDPE (no PTFE)	20 mL	00352101042767	Grey	No	
017	1302_MW133_220308	HDPE (no PTFE)	20 mL	00352101042770	Grey	No	
018	1302_MW303_220308	HDPE (no PTFE)	20 mL	00352101042825	Grey	No	
018	1302_MW303_220308	HDPE (no PTFE)	20 mL	00352101042876	Grey	No	
019	1302_QC101_220308	HDPE (no PTFE)	20 mL	00352101042847	Grey	No	
019	1302_QC101_220308	HDPE (no PTFE)	20 mL	00352101042857	Grey	No	
020	1302_MW297_220308	HDPE (no PTFE)	20 mL	00352101042701	Grey	No	
020	1302_MW297_220308	HDPE (no PTFE)	20 mL	00352101042868	Grey	No	
021	1302_MW185_220308	HDPE (no PTFE)	20 mL	00352101042775	Grey	No	
021	1302_MW185_220308	HDPE (no PTFE)	20 mL	00352101042822	Grey	No	
022	1302_MW195_220308	HDPE (no PTFE)	20 mL	00352101042791	Grey	No	
022	1302_MW195_220308	HDPE (no PTFE)	20 mL	00352101042841	Grey	No	
023	1302_MW194_220308	HDPE (no PTFE)	20 mL	00352101042606	Grey	No	
023	1302_MW194_220308	HDPE (no PTFE)	20 mL	00352101042626	Grey	No	
024	1302_MW190_220308	HDPE (no PTFE)	20 mL	00352101042778	Grey	No	
024	1302_MW190_220308	HDPE (no PTFE)	20 mL	00352101042655	Grey	No	
025	1302_MW191_220308	HDPE (no PTFE)	20 mL	00352101042779	Grey	No	
025	1302_MW191_220308	HDPE (no PTFE)	20 mL	00352101042617	Grey	No	
026	1302_MW210_220308	HDPE (no PTFE)	20 mL	00352101042637	Grey	No	
026	1302_MW210_220308	HDPE (no PTFE)	20 mL	00352101042718	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 34744 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 11.03.22 12.30pm	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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:

027	1302_MW209_220308	HDPE (no PTFE)	20 mL	0035210104270 4	Grey	No	
027	1302_MW209_220308	HDPE (no PTFE)	20 mL	0035210104271 1	Grey	No	
028	1302_MW107_220309	HDPE (no PTFE)	20 mL	0035210104274 0	Grey	No	
028	1302_MW107_220309	HDPE (no PTFE)	20 mL	0035210104268 7	Grey	No	
029	1302_QC402_220309	HDPE (no PTFE)	20 mL	0035210104273 4	Grey	No	
029	1302_QC402_220309	HDPE (no PTFE)	20 mL	0035210104259 2	Grey	No	
030	1302_MW421_220309	HDPE (no PTFE)	20 mL	0035210104267 9	Grey	No	
030	1302_MW421_220309	HDPE (no PTFE)	20 mL	0035210104283 8	Grey	No	
031	1302_QC102_220309	HDPE (no PTFE)	20 mL	0035210104276 6	Grey	No	
031	1302_QC102_220309	HDPE (no PTFE)	20 mL	0035210104267 5	Grey	No	
032	1302_QC201_220309	HDPE (no PTFE)	20 mL	0035210104258 7	Grey	No	
032	1302_QC201_220309	HDPE (no PTFE)	20 mL	0035210104279 6	Grey	No	
032	1302_QC201_220309	HDPE (no PTFE)	20 mL	0035210601518 7	Grey	No	
033	1302_MW197_220309	HDPE (no PTFE)	20 mL	0035210104261 3	Grey	No	
033	1302_MW197_220309	HDPE (no PTFE)	20 mL	0035210104275 4	Grey	No	
034	1302_MW240_220309	HDPE (no PTFE)	20 mL	0035210104270 8	Grey	No	
034	1302_MW240_220309	HDPE (no PTFE)	20 mL	0035210104276 2	Grey	No	
035	1302_MW453_220309	HDPE (no PTFE)	20 mL	0035210102147 2	Grey	No	
035	1302_MW453_220309	HDPE (no PTFE)	20 mL	0035210104285 2	Grey	No	
036	1302_MW144_220309	HDPE (no PTFE)	20 mL	0035210104281 1	Grey	No	
036	1302_MW144_220309	HDPE (no PTFE)	20 mL	0035210104283 3	Grey	No	
037	1302_MW141_220309	HDPE (no PTFE)	20 mL	0035210104276 4	Grey	No	
037	1302_MW141_220309	HDPE (no PTFE)	20 mL	0035210104268 1	Grey	No	
038	1302_QC103_220309	HDPE (no PTFE)	20 mL	0035210104273 0	Grey	No	
038	1302_QC103_220309	HDPE (no PTFE)	20 mL	0035210104286 9	Grey	No	
039	1302_MW139_220309	HDPE (no PTFE)	20 mL	0035210104283 9	Grey	No	
039	1302_MW139_220309	HDPE (no PTFE)	20 mL	0035210104279 2	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 34744 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 11.03.22 12.30pm	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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:

040	1302_MW422_220309	HDPE (no PTFE)	20 mL	00352101042769	Grey	No	
040	1302_MW422_220309	HDPE (no PTFE)	20 mL	00352101042755	Grey	No	
041	1302_MW454_220309	HDPE (no PTFE)	20 mL	00352106015249	Grey	No	
041	1302_MW454_220309	HDPE (no PTFE)	20 mL	00352106015223	Grey	No	
042	1302_MW112_220310	HDPE (no PTFE)	20 mL	00352101042728	Grey	No	
042	1302_MW112_220310	HDPE (no PTFE)	20 mL	00352101042696	Grey	No	
043	1302_QC403_220310	HDPE (no PTFE)	20 mL	00352101042629	Grey	No	
043	1302_QC403_220310	HDPE (no PTFE)	20 mL	00352101042843	Grey	No	
044	1302_MW205_220310	HDPE (no PTFE)	20 mL	00352101042761	Grey	No	
044	1302_MW205_220310	HDPE (no PTFE)	20 mL	00352101042863	Grey	No	
045	1302_MW115_220310	HDPE (no PTFE)	20 mL	00352101042676	Grey	No	
045	1302_MW115_220310	HDPE (no PTFE)	20 mL	00352101042768	Grey	No	
046	1302_MW156_220310	HDPE (no PTFE)	20 mL	00352101042648	Grey	No	
046	1302_MW156_220310	HDPE (no PTFE)	20 mL	00352101042715	Grey	No	

Total Bottle Count: ALS: 94, Non ALS: 0

ALSCompass
SAMPLING *Intelligence*

ALS Use Only

Custody Document for Submissions via ALS Compass App

Project: 60612561 Ex. 1 **Client:** AECOM **Project Manager:**
Phone: ( )

ALS Compass COC Reference: 34744 **# Samples:** **Sampler:**
Phone: ( )

Turnaround Requirements: Standard ✓ Urgent

Special Instructions:	ALS Use Only			
	Custody seal intact?	YES	NO	N/A
	Free ice / frozen ice bricks upon receipt?	YES	NO	N/A
	Random sample temperature on receipt?		°C	

Custody:

Relinquished by: [redacted]	**Received by:** [redacted]	**Relinquished by:**	**Received by:**
Date / Time: 1047 10/3/22	**Date / Time:** 10:47a 10/03/22	**Date / Time:**	**Date / Time:**

CHAIN OF CUSTODY

(ALS) COC#: 35017 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 18/3/22 12:30pm	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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:			

Environmental Division
Sydney
Work Order Reference
ES2209679

Telephone : +61-2-8784 8555

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1302_SW170_220314		14/03/2022 02:07 PM	Water	ALS: 2 Non ALS: 0	No	X		
002	1302_QC100_220314		14/03/2022 02:09 PM	Water	ALS: 2 Non ALS: 0	No	X		
003	1302_QC200_220314		14/03/2022 02:09 PM	Water	ALS: 3 Non ALS: 0	No	X		Please forward to NMI additional lab qc provided
004	1302_QC400_220314		14/03/2022 02:10 PM	Water	ALS: 2 Non ALS: 0	No	X		
005	1302_SW152_220314		14/03/2022 02:11 PM	Water	ALS: 2 Non ALS: 0	No	X		
006	1302_QC500_220314		14/03/2022 02:12 PM	Water	ALS: 2 Non ALS: 0	No	X		
007	1302_QC300_220314		14/03/2022 02:53 PM	Water	ALS: 2 Non ALS: 0	No	X		
008	1302_SW178_220314		14/03/2022 02:54 PM	Water	ALS: 2 Non ALS: 0	No	X		
009	1302_SW181_220314		14/03/2022 03:02 PM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 35017 *ALS Laboratory:* ES Sydney

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

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	1302_SW162_220314		14/03/2022 03:50 PM	Water	ALS: 2 Non ALS: 0	No	X		
011	1302_SW109_220314		14/03/2022 05:18 PM	Water	ALS: 2 Non ALS: 0	No	X		
012	1302_SW114_220314		14/03/2022 05:39 PM	Water	ALS: 2 Non ALS: 0	No	X		
013	1302_SW115_220314		14/03/2022 06:03 PM	Water	ALS: 2 Non ALS: 0	No	X		
014	1302_SW125_220315		15/03/2022 03:58 PM	Water	ALS: 2 Non ALS: 0	No	X		
015	1302_SW120_220315		15/03/2022 04:09 PM	Water	ALS: 2 Non ALS: 0	No	X		
016	1302_SW168_220315		15/03/2022 04:40 PM	Water	ALS: 2 Non ALS: 0	No	X		
017	1302_QC101_220315		15/03/2022 04:41 PM	Water	ALS: 2 Non ALS: 0	No	X		
018	1302_QC401_220315		15/03/2022 04:42 PM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 35017 *ALS Laboratory:* ES Sydney

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

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	1302_QC301_220315		15/03/2022 04:42 PM	Water	ALS: 2 Non ALS: 0	No	X		
020	1302_SW106_220315		15/03/2022 05:09 PM	Water	ALS: 2 Non ALS: 0	No	X		
021	1302_QC201_220315		15/03/2022 05:10 PM	Water	ALS: 3 Non ALS: 0	Yes	-		Please fwd to NMI, additional vol. lab qc provided
022	1302_SW108_220315		15/03/2022 05:24 PM	Water	ALS: 2 Non ALS: 0	No	X		
023	1302_SW132_220315		15/03/2022 05:54 PM	Water	ALS: 2 Non ALS: 0	No	X		
024	1302_SW133_220315		15/03/2022 06:19 PM	Water	ALS: 2 Non ALS: 0	No	X		
025	1302_SW113_220316		16/03/2022 10:23 AM	Water	ALS: 2 Non ALS: 0	No	X		
026	1302_QC302_220316		16/03/2022 10:24 AM	Water	ALS: 2 Non ALS: 0	No	X		
027	1302_QC402_220316		16/03/2022 10:25 AM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 35017 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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 Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	1302_SW112_220316		16/03/2022 10:41 AM	Water	ALS: 2 Non ALS: 0	No	X		
029	1302_SW124_220316		16/03/2022 11:06 AM	Water	ALS: 2 Non ALS: 0	No	X		
030	1302_SW143_220316		16/03/2022 11:56 AM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

(ALS) COC#: 35017 *ALS Laboratory:* ES Sydney

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

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	1302_SW170_220314	HDPE (no PTFE)	20 mL	0035210104279 8	Grey	No	
001	1302_SW170_220314	HDPE (no PTFE)	20 mL	0035210104278 0	Grey	No	
002	1302_QC100_220314	HDPE (no PTFE)	20 mL	0035210104284 0	Grey	No	
002	1302_QC100_220314	HDPE (no PTFE)	20 mL	0035210104282 8	Grey	No	
003	1302_QC200_220314	HDPE (no PTFE)	20 mL	0035021902342 6	Grey	No	
003	1302_QC200_220314	HDPE (no PTFE)	20 mL	0035210104286 7	Grey	No	
003	1302_QC200_220314	HDPE (no PTFE)	20 mL	0035210104260 5	Grey	No	
004	1302_QC400_220314	HDPE (no PTFE)	20 mL	0035210104285 9	Grey	No	
004	1302_QC400_220314	HDPE (no PTFE)	20 mL	0035210104278 2	Grey	No	
005	1302_SW152_220314	HDPE (no PTFE)	20 mL	0035210104259 5	Grey	No	
005	1302_SW152_220314	HDPE (no PTFE)	20 mL	0035210104267 8	Grey	No	
006	1302_QC500_220314	HDPE (no PTFE)	20 mL	0035210104264 7	Grey	No	
006	1302_QC500_220314	HDPE (no PTFE)	20 mL	0035210104269 5	Grey	No	
007	1302_QC300_220314	HDPE (no PTFE)	20 mL	0035210104274 6	Grey	No	
007	1302_QC300_220314	HDPE (no PTFE)	20 mL	0035210104283 4	Grey	No	
008	1302_SW178_220314	HDPE (no PTFE)	20 mL	0035210104272 6	Grey	No	
008	1302_SW178_220314	HDPE (no PTFE)	20 mL	0035210104258 5	Grey	No	
009	1302_SW181_220314	HDPE (no PTFE)	20 mL	0035210104268 6	Grey	No	
009	1302_SW181_220314	HDPE (no PTFE)	20 mL	0035210104198 0	Grey	No	
010	1302_SW162_220314	HDPE (no PTFE)	20 mL	0035210104259 7	Grey	No	
010	1302_SW162_220314	HDPE (no PTFE)	20 mL	0035210104260 3	Grey	No	
011	1302_SW109_220314	HDPE (no PTFE)	20 mL	0035210104287 8	Grey	No	
011	1302_SW109_220314	HDPE (no PTFE)	20 mL	0035210104282 6	Grey	No	
012	1302_SW114_220314	HDPE (no PTFE)	20 mL	0035210104264 1	Grey	No	
012	1302_SW114_220314	HDPE (no PTFE)	20 mL	0035210104281 5	Grey	No	
013	1302_SW115_220314	HDPE (no PTFE)	20 mL	0035210104283 2	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 35017 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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:

013	1302_SW115_220314	HDPE (no PTFE)	20 mL	00352101042635	Grey	No	
014	1302_SW125_220315	HDPE (no PTFE)	20 mL	00352101042794	Grey	No	
014	1302_SW125_220315	HDPE (no PTFE)	20 mL	00352101042803	Grey	No	
015	1302_SW120_220315	HDPE (no PTFE)	20 mL	00352101042858	Grey	No	
015	1302_SW120_220315	HDPE (no PTFE)	20 mL	00352101042829	Grey	No	
016	1302_SW168_220315	HDPE (no PTFE)	20 mL	00352101042763	Grey	No	
016	1302_SW168_220315	HDPE (no PTFE)	20 mL	00352101042706	Grey	No	
017	1302_QC101_220315	HDPE (no PTFE)	20 mL	00352101042802	Grey	No	
017	1302_QC101_220315	HDPE (no PTFE)	20 mL	00352101042823	Grey	No	
018	1302_QC401_220315	HDPE (no PTFE)	20 mL	00352101042667	Grey	No	
018	1302_QC401_220315	HDPE (no PTFE)	20 mL	00352101042817	Grey	No	
019	1302_QC301_220315	HDPE (no PTFE)	20 mL	00352101042745	Grey	No	
019	1302_QC301_220315	HDPE (no PTFE)	20 mL	00352101042729	Grey	No	
020	1302_SW106_220315	HDPE (no PTFE)	20 mL	00352101042659	Grey	No	
020	1302_SW106_220315	HDPE (no PTFE)	20 mL	00352101042751	Grey	No	
021	1302_QC201_220315	HDPE (no PTFE)	20 mL	00352106015322	Grey	No	
021	1302_QC201_220315	HDPE (no PTFE)	20 mL	00352101042689	Grey	No	
021	1302_QC201_220315	HDPE (no PTFE)	20 mL	00352101042784	Grey	No	
022	1302_SW108_220315	HDPE (no PTFE)	20 mL	00352101042732	Grey	No	
022	1302_SW108_220315	HDPE (no PTFE)	20 mL	00352101042735	Grey	No	
023	1302_SW132_220315	HDPE (no PTFE)	20 mL	00352101042879	Grey	No	
023	1302_SW132_220315	HDPE (no PTFE)	20 mL	00352101042620	Grey	No	
024	1302_SW133_220315	HDPE (no PTFE)	20 mL	00352101042820	Grey	No	
024	1302_SW133_220315	HDPE (no PTFE)	20 mL	00352101042862	Grey	No	
025	1302_SW113_220316	HDPE (no PTFE)	20 mL	00352101042864	Grey	No	
025	1302_SW113_220316	HDPE (no PTFE)	20 mL	00352101042875	Grey	No	
026	1302_QC302_220316	HDPE (no PTFE)	20 mL	00352101042590	Grey	No	

CHAIN OF CUSTODY

(ALS) COC#: 35017 *ALS Laboratory:* ES Sydney

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

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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:

026	1302_QC302_220316	HDPE (no PTFE)	20 mL	00352101042756	Grey	No	
027	1302_QC402_220316	HDPE (no PTFE)	20 mL	00352101042683	Grey	No	
027	1302_QC402_220316	HDPE (no PTFE)	20 mL	00352101042806	Grey	No	
028	1302_SW112_220316	HDPE (no PTFE)	20 mL	00352101042810	Grey	No	
028	1302_SW112_220316	HDPE (no PTFE)	20 mL	00352101042877	Grey	No	
029	1302_SW124_220316	HDPE (no PTFE)	20 mL	00352101042690	Grey	No	
029	1302_SW124_220316	HDPE (no PTFE)	20 mL	00352101042856	Grey	No	
030	1302_SW143_220316	HDPE (no PTFE)	20 mL	00352101042725	Grey	No	
030	1302_SW143_220316	HDPE (no PTFE)	20 mL	00352101042781	Grey	No	

Total Bottle Count: ALS: 62, Non ALS: 0

ALSCompass SAMPLING Intelligence

ALS

ALS Use Only

Custody Document for Submissions via ALS Compass App

Project: 60612561 4.1 **Client:** AECOM **Project Manager:** [redacted]

Phone: [redacted]

ALS Compass COC Reference: 35017 **# Samples:** _____ **Sampler:** _____

Phone: _____

Turnaround Requirements: Standard ✓ Urgent _____

Special Instructions:	ALS Use Only			
	Custody seal intact?	YES	NO	N/A
	Free ice / frozen ice bricks upon receipt?	YES	NO	N/A
	Random sample temperature on receipt?		°C	

Custody:

Relinquished by:	**Received by:**	**Relinquished by:**	**Received by:**
[redacted]	[redacted]		
Date / Time: 16/3/22 10:51	**Date / Time:** 10:51 am 16/03/22	**Date / Time:**	**Date / Time:**

12.04.22

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 4971 5900 E: gladstone@alsglobal.com

MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

MELBOURNE 24 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

TOWNSVILLE 14-16 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville@alsglobal.com

WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	✱ Standard TAT (List due date):
OFFICE: Darwin		☐ Non Standard or urgent TAT (List due date):
PROJECT: ~~NT 2022 WQM 22~~ NT_PFASOMP	ALS QUOTE NO.: ~~EV-178-20-Rev2~~	54/159/19V3
ORDER NUMBER: 60612561 4.1	Invoicing: ~~6067[illegible]~~ 60612561 461	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7

FOR 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:	19.4 °C		
Other comment:			

[redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
[redacted]	[redacted]		[redacted]
DATE/TIME: 01/4/22	DATE/TIME: 1/4/22 11:20	DATE/TIME:	DATE/TIME: 05.04.22 7.30am

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X	Suspended Solids - EA025H	Cations/ Anions - NT-01&02A	TRH/BTEXN/8 metals - W-05	8 Dissolved Metals - W-02	Additional metal (Fe) - EG020	MNA - W-28	Explosives - EP203SL	Tributyltin	VOC trip blank - W18	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	1302_SW300_220401	01/04/22 1035	W	P	2	✓										
2	1302-SW170_220401	0950	W		2	✓										
3	1302_SW109_220401	11:010	W		2	✓										
4	1302_QC100_220401	11:00	W		2	✓										
	1302_QC200_220401	11:00	W		3	✓										PLS FWD TO B21 ALS.
5	1302_QC300_220401	1055	W		2	✓										
6	1302_QC400_220401	1055	W		2	✓										
7	1302_QC500_220401	0700	W		2	✓										
			W													
			W													
			W													
			W													
				TOTAL	17											

LAB OF ORIGIN DARWIN

Environmental Division Sydney
Work Order Reference
ES2211499

Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = F
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS COC#: 32344 ALS Laboratory: ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_RAAF_Darwin_PFASOMP

SITE: 1302_RAAF_Darwin

ORDER NO:

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: 22/1

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle) AEC006/220119

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_Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1302_SW170_220113		13/01/2022 02:14 PM	Water	ALS: 2 Non ALS: 0	No	X		
002	1302_QC100_220113	N22/001013	13/01/2022 02:16 PM	Water	ALS: 2 Non ALS: 0	No	X		
003	1302_QC200_220113		13/01/2022 02:22 PM	Water	ALS: 3 Non ALS: 0	No	X		Pls fed to NMI. extra vol for lab QC
004	1302_SW162_220113		13/01/2022 03:11 PM	Water	ALS: 2 Non ALS: 0	No	X		
005	1302_QC300_220113		13/01/2022 03:14 PM	Water	ALS: 2 Non ALS: 0	No	X		
006	1302_QC400_220113		13/01/2022 03:15 PM	Water	ALS: 2 Non ALS: 0	No	X		
007	1302_SW109_220113		13/01/2022 04:51 PM	Water	ALS: 2 Non ALS: 0	No	X		
008	1302_SW108_220113		13/01/2022 05:10 PM	Water	ALS: 2 Non ALS: 0	No	X		
009	1302_SW168_220113		13/01/2022 05:23 PM	Water	ALS: 2 Non ALS: 0	No	X		

Subcon / Forward Lab / Split WO

Lab / Analysis:

Organised By / Date: NMI

Relinquished By / Date: QC200

Connote / Courier: QC201

WO No: ES2201342

Attach By PO / Internal Sheet:

Received bottles:

1 500 ml
2 200 ml
3 100 ml
4 20 ml x 2
5 125 Amber bottles
6 2-vials

RECEIVED
19 JAN 2022
BY: ...N.N...4:10...

Environmental Division
Sydney
Work Order Reference
ES2201342

Telephone : +61-2-8784 8555

CHAIN OF CUSTODY

COC#: 32344 *ALS Laboratory:* ES Sydney

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

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_RAAF_Darwin_PFASOMP

SITE: 1302_RAAF_Darwin

ORDER NO:

PROJECT MANAGER:
PRIMARY SAMPLER:

EMAIL REPORTS TO:

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	PFAS_Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	1302_SW112_220114		14/01/2022 11:42 AM	Water	ALS: 2 Non ALS: 0	No	X		
011	1302_SW113_220114		14/01/2022 11:54 AM	Water	ALS: 2 Non ALS: 0	No	X		
012	1302_SW115_220114		14/01/2022 09:32 AM	Water	ALS: 2 Non ALS: 0	No	X		
013	1302_SW106_220114		14/01/2022 09:56 AM	Water	ALS: 2 Non ALS: 0	No	X		
014	1302_QC101_220114		14/01/2022 09:57 AM	Water	ALS: 2 Non ALS: 0	No	X		
015	1302_QC301_220114		14/01/2022 10:03 AM	Water	ALS: 2 Non ALS: 0	No	X		
016	1302_QC401_220114		14/01/2022 10:04 AM	Water	ALS: 2 Non ALS: 0	No	X		
017	1302_SW114_220114		14/01/2022 11:01 AM	Water	ALS: 2 Non ALS: 0	No	X		
018	1302_SW104_220114		14/01/2022 11:15 AM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 32344 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_RAAF_Darwin_PFASOMP

SITE: 1302_RAAF_Darwin

ORDER NO:

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_Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	1302_SW120_220114		14/01/2022 12:16 PM	Water	ALS: 2 Non ALS: 0	No	X		
020	1302_SW124_220114		14/01/2022 12:36 PM	Water	ALS: 2 Non ALS: 0	No	X		
021	1302_SW125_220114		14/01/2022 12:58 PM	Water	ALS: 2 Non ALS: 0	No	X		
022	1302_SW132_220114		14/01/2022 02:40 PM	Water	ALS: 2 Non ALS: 0	No	X		
023	1302_SW133_220114		14/01/2022 03:10 PM	Water	ALS: 2 Non ALS: 0	No	X		
024	1302_SW143_22011		14/01/2022 03:31 PM	Water	ALS: 2 Non ALS: 0	No	X		
025	1302_SW178_220117		17/01/2022 02:10 PM	Water	ALS: 2 Non ALS: 0	No	X		
026	1302_SW181_220117		17/01/2022 02:20 PM	Water	ALS: 2 Non ALS: 0	No	X		
027	1302_QC302_220117		17/01/2022 02:26 PM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

ALS COC#: 32344 *ALS Laboratory:* ES Sydney

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

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: 1302_RAAF_Darwin_PFASOMP

SITE: 1302_RAAF_Darwin

ORDER NO:

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	PFAS_Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	1302_QC402_220117		17/01/2022 02:27 PM	Water	ALS: 2 Non ALS: 0	No	X		
029	1302_SW160_220117		17/01/2022 02:45 PM	Water	ALS: 2 Non ALS: 0	No	X		
030	1302_SW156_220117		17/01/2022 03:03 PM	Water	ALS: 2 Non ALS: 0	No	X		
031	1302_SW152_220117		17/01/2022 03:46 PM	Water	ALS: 2 Non ALS: 0	No	X		
032	1302_QC102_220117		17/01/2022 03:47 PM	Water	ALS: 2 Non ALS: 0	No	X		
033	1302_QC201_220117	N22/001014	17/01/2022 03:48 PM	Water	ALS: 3 Non ALS: 0	No	X		Please forward to NMI. Additional volume for lab qc

→ Received: 1
① 200 mls 1 bottle wt.
② 20mls x 2 "

NMT

AECOQ6/220309/1

16/3

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

CLIENT: AECOM	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ✠ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE: Darwin	ALS QUOTE NO.: ~~SY-478-20-B-v2~~ SY/139/19 V3
PROJECT: NT_1302_~~WQMP-22~~ PFASCMP	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
ORDER NUMBER: 60612561	[redacted] 61 / 4.1

FOR 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 comment:			

RELINQUISHED	RECEIVED	RELINQUISHED BY:	RECEIVED BY:
[redacted]	[redacted]		
DATE/TIME: 3/3/22	DATE/TIME: 03/02/22 9:35	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X	Suspended Solids - EA025H	Cations/ Anions - NT-01&02A	TRH/BTEXN/8 metals - W-05	8 Dissolved Metals - W-02	Additional metal (Fe) - EG020	MNA - W-28	Explosives - EP203SL	Tributyltin	VOC trip blank - W18	Comments on likely contaminant levels, dilutions or samples requiring specific QC analysis etc.
1	1302_SW300_220302	2/3/22 1107	W	P	2	✓										
2	1302_SW109_220302	2/3/22 1149	W		2	✓										
3	1302_QC100_220302	1149	W		2	✓										
—	1302_QC200_220302	1149	W	N22/004125	4	✓										
4	1302_QC400_220302		W		2	✓										
5	1302_QC500_220302		W		2	✓										
6	1302_SW170_220302	15:00	W		2	✓										
			W													
	Extra sample received:		W													
	N.B. NEWO.		W													
	(2) LAB QC.		W													
			W													
			W													
			W													
			W													
				TOTAL	16											

Subcon / Forward Lab / Split WO
Lab / Analysis:
Organised By / Date: NMT
Relinquished By / Date: QC200
Connote / Courier:
WO No: ES2207387
Attach By PO / Internal Sheet:

RECEIVED
09 MAR 2022
BY: [redacted] 15:20

BOC COIN DARWIN

PES FWD NMT

Environmental Division Sydney
Work Order Reference
ES2207387

Telephone : +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formalde. Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

COC#: 34744 *ALS Laboratory:* ES Sydney

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

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

EMAIL REPORTS TO:

EMAIL INVOICES TO:

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle) 23/3

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: AECOQC/220316

NW

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1302_MW128_220307		07/03/2022 01:56 PM	Water	ALS: 2 Non ALS: 0	No	X		
002	1302_QC400_220307		07/03/2022 01:57 PM	Water	ALS: 2 Non ALS: 0	No	X		
003	1302_QC200_220307		07/03/2022 01:58 PM	Water	ALS: 3 Non ALS: 0	No	X		Please fwd to NMI, extra lab qc included
004	1302_QC100_220307		07/03/2022 02:00 PM	Water	ALS: 2 Non ALS: 0	No	X		
005	1302_QC500_220307		07/03/2022 02:01 PM	Water	ALS: 2 Non ALS: 0	No	X		
006	1302_MW103_220307		07/03/2022 02:22 PM	Water	ALS: 2 Non ALS: 0	No	X		
007	1302_QC300_220307		07/03/2022 04:45 PM	Water	ALS: 2 Non ALS: 0	No	X		
008	1302_QC401_220308		08/03/2022 08:45 AM	Water	ALS: 2 Non ALS: 0	No	X		
009	1302_MW176_220308		08/03/2022 08:47 AM	Water	ALS: 2 Non ALS: 0	No	X		

N22/004665

Environmental Division Sydney

Work Order Reference

ES2208419

Telephone : +61-2-8784 8555

RECEIVED

16 MAR 2022

BY: [redacted]

Subcon / Forward Lab / Split WO

Lab / Analysis:

Organised By / Date: NMI

Relinquished By / Date: QC200

Connote / Courier: QC201

WO No: ES2208419

Attach By PO / Internal Sheet:

CHAIN OF CUSTODY

COC#: **34744** *ALS Laboratory:* ES Sydney

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

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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 Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	1302_MW200_220308		08/03/2022 09:03 AM	Water	ALS: 2 Non ALS: 0	No	X		
011	1302_MW211_220308		08/03/2022 09:16 AM	Water	ALS: 2 Non ALS: 0	No	X		
012	1302_MW180_220308		08/03/2022 09:29 AM	Water	ALS: 2 Non ALS: 0	No	X		
013	1302_MW201_220308		08/03/2022 09:59 AM	Water	ALS: 2 Non ALS: 0	No	X		
014	1302_MW452_220308		08/03/2022 10:10 AM	Water	ALS: 2 Non ALS: 0	No	X		
015	1302_MW451_220308		08/03/2022 10:19 AM	Water	ALS: 2 Non ALS: 0	No	X		
016	1302_QC301_220308		08/03/2022 10:27 AM	Water	ALS: 2 Non ALS: 0	No	X		
017	1302_MW133_220308		08/03/2022 11:59 AM	Water	ALS: 2 Non ALS: 0	No	X		
018	1302_MW303_220308		08/03/2022 01:14 PM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **34744** *ALS Laboratory:* ES Sydney

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

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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 Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	1302_QC101_220308		08/03/2022 01:15 PM	Water	ALS: 2 Non ALS: 0	No	X		
020	1302_MW297_220308		08/03/2022 01:56 PM	Water	ALS: 2 Non ALS: 0	No	X		
021	1302_MW185_220308		08/03/2022 04:02 PM	Water	ALS: 2 Non ALS: 0	No	X		
022	1302_MW195_220308		08/03/2022 04:20 PM	Water	ALS: 2 Non ALS: 0	No	X		
023	1302_MW194_220308		08/03/2022 04:32 PM	Water	ALS: 2 Non ALS: 0	No	X		
024	1302_MW190_220308		08/03/2022 04:43 PM	Water	ALS: 2 Non ALS: 0	No	X		
025	1302_MW191_220308		08/03/2022 04:54 PM	Water	ALS: 2 Non ALS: 0	No	X		
026	1302_MW210_220308		08/03/2022 05:12 PM	Water	ALS: 2 Non ALS: 0	No	X		
027	1302_MW209_220308		08/03/2022 05:28 PM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **34744** *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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 Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	1302_MW107_220309		09/03/2022 10:09 AM	Water	ALS: 2 Non ALS: 0	No	X		
029	1302_QC402_220309		09/03/2022 10:28 AM	Water	ALS: 2 Non ALS: 0	No	X		
030	1302_MW421_220309		09/03/2022 10:29 AM	Water	ALS: 2 Non ALS: 0	No	X		
031	1302_QC102_220309		09/03/2022 10:30 AM	Water	ALS: 2 Non ALS: 0	No	X		
032	1302_QC201_220309		09/03/2022 10:31 AM	Water	ALS: 3 Non ALS: 0	No	X N22/004666		Please forward to NMI Additional lab qc provided
033	1302_MW197_220309		09/03/2022 10:51 AM	Water	ALS: 2 Non ALS: 0	No	X		
034	1302_MW240_220309		09/03/2022 11:01 AM	Water	ALS: 2 Non ALS: 0	No	X		
035	1302_MW453_220309		09/03/2022 11:11 AM	Water	ALS: 2 Non ALS: 0	No	X		
036	1302_MW144_220309		09/03/2022 11:35 AM	Water	ALS: 2 Non ALS: 0	No	X		

RECEIVED
16 MAR 2022
BY: .....

CHAIN OF CUSTODY

COC#: **34744** *ALS Laboratory:* ES Sydney

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

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
037	1302_MW141_220309		09/03/2022 11:55 AM	Water	ALS: 2 Non ALS: 0	No	X		
038	1302_QC103_220309		09/03/2022 11:56 AM	Water	ALS: 2 Non ALS: 0	No	X		
039	1302_MW139_220309		09/03/2022 12:10 PM	Water	ALS: 2 Non ALS: 0	No	X		
040	1302_MW422_220309		09/03/2022 12:20 PM	Water	ALS: 2 Non ALS: 0	No	X		
041	1302_MW454_220309		09/03/2022 12:25 PM	Water	ALS: 2 Non ALS: 0	No	X		
042	1302_MW112_220310		10/03/2022 10:02 AM	Water	ALS: 2 Non ALS: 0	No	X		
043	1302_QC403_220310		10/03/2022 10:03 AM	Water	ALS: 2 Non ALS: 0	No	X		
044	1302_MW205_220310		10/03/2022 10:21 AM	Water	ALS: 2 Non ALS: 0	No	X		
045	1302_MW115_220310		10/03/2022 10:27 AM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: **34744** *ALS Laboratory:* ES Sydney

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

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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 Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
046	1302_MW156_220310		10/03/2022 10:50 AM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 35017 *ALS Laboratory:* ES Sydney

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 18/3/22 12:30pm	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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: AEco#91220408
Due 20/04/22
19/4
RV

SAMPLE DETAILS | **ANALYSIS REQUIRED**

SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	1302_SW170_220314		14/03/2022 02:07 PM	Water	ALS: 2 Non ALS: 0	No	X		
002	1302_QC100_220314		14/03/2022 02:09 PM	Water	ALS: 2 Non ALS: 0	No	X		
003	1302_QC200_220314	N22/006477	14/03/2022 02:09 PM	Water	ALS: 3 Non ALS: 0	No	X		Please forward to NMI additional lab qc provided
004	1302_QC400_220314		14/03/2022 02:10 PM	Water	ALS: 2 Non ALS: 0	No	X		
005	1302_SW152_220314		14/03/2022 02:11 PM	Water	ALS: 2 Non ALS: 0	No	X		
006	1302_QC500_220314		14/03/2022 02:12 PM	Water	ALS: 2 Non ALS: 0	No	X		
007	1302_QC300_220314		14/03/2022 02:53 PM	Water	ALS: 2 Non ALS: 0	No	X		
008	1302_SW178_220314		14/03/2022 02:54 PM	Water	ALS: 2 Non ALS: 0	No	X		
009	1302_SW181_220314		14/03/2022 03:02 PM	Water	ALS: 2 Non ALS: 0	No	X		

Environmental Division
Sydney
Work Order Reference
ES2209679

Telephone : +61-2-8784 8555

CCAT
#3,4

1 x 250mL
2 x 40mL

RECEIVED
08 APR 2022
BY: Ao 15:15

CHAIN OF CUSTODY

ALS COC#: 35017 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

PROJECT MANAGER:
PRIMARY SAMPLER:

EMAIL REPORTS TO:

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:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	1302_SW162_220314		14/03/2022 03:50 PM	Water	ALS: 2 Non ALS: 0	No	X		
011	1302_SW109_220314		14/03/2022 05:18 PM	Water	ALS: 2 Non ALS: 0	No	X		
012	1302_SW114_220314		14/03/2022 05:39 PM	Water	ALS: 2 Non ALS: 0	No	X		
013	1302_SW115_220314		14/03/2022 06:03 PM	Water	ALS: 2 Non ALS: 0	No	X		
014	1302_SW125_220315		15/03/2022 03:58 PM	Water	ALS: 2 Non ALS: 0	No	X		
015	1302_SW120_220315		15/03/2022 04:09 PM	Water	ALS: 2 Non ALS: 0	No	X		
016	1302_SW168_220315		15/03/2022 04:40 PM	Water	ALS: 2 Non ALS: 0	No	X		
017	1302_QC101_220315		15/03/2022 04:41 PM	Water	ALS: 2 Non ALS: 0	No	X		
018	1302_QC401_220315		15/03/2022 04:42 PM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 35017 *ALS Laboratory:* ES Sydney

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

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

PROJECT MANAGER:

PRIMARY SAMPLER:

EMAIL REPORTS TO:

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	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	1302_QC301_220315		15/03/2022 04:42 PM	Water	ALS: 2 Non ALS: 0	No	X		
020	1302_SW106_220315		15/03/2022 05:09 PM	Water	ALS: 2 Non ALS: 0	No	X		
021	1302_QC201_220315	N22/006478	15/03/2022 05:10 PM	Water	ALS: 3 Non ALS: 0	Yes	-		Please fwd to NMI, additional vol. lab qc provided
022	1302_SW108_220315		15/03/2022 05:24 PM	Water	ALS: 2 Non ALS: 0	No	X		
023	1302_SW132_220315		15/03/2022 05:54 PM	Water	ALS: 2 Non ALS: 0	No	X		
024	1302_SW133_220315		15/03/2022 06:19 PM	Water	ALS: 2 Non ALS: 0	No	X		
025	1302_SW113_220316		16/03/2022 10:23 AM	Water	ALS: 2 Non ALS: 0	No	X		
026	1302_QC302_220316		16/03/2022 10:24 AM	Water	ALS: 2 Non ALS: 0	No	X		
027	1302_QC402_220316		16/03/2022 10:25 AM	Water	ALS: 2 Non ALS: 0	No	X		

CHAIN OF CUSTODY

COC#: 35017 *ALS Laboratory:* ES Sydney

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

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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 Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	1302_SW112_220316		16/03/2022 10:41 AM	Water	ALS: 2 Non ALS: 0	No	X		
029	1302_SW124_220316		16/03/2022 11:06 AM	Water	ALS: 2 Non ALS: 0	No	X		
030	1302_SW143_220316		16/03/2022 11:56 AM	Water	ALS: 2 Non ALS: 0	No	X		

ALSCompass SAMPLING Intelligence

ALS Use Only

Custody Document for Submissions via ALS Compass App

Project: 60612561 4.1 Client: AECOM Project Manager: [redacted]

Phone: [redacted]

ALS Compass COC Reference: 35017 # Samples: Sampler: [redacted]

Phone: [redacted]

Turnaround Requirements: Standard ✓ Urgent

Special Instructions:	ALS Use Only			
	Custody seal intact?	YES	NO	N/A
	Free ice / frozen ice bricks upon receipt?	YES	NO	N/A
	Random sample temperature on receipt?		°C	

Custody:

Relinquished by:	Received by:	Relinquished by:	Received by:
[redacted]	[redacted]		
Date / Time: 16/3/22 10:51	Date / Time: 10:51 am 16/03/22	Date / Time:	Date / Time:

CHAIN OF CUSTODY

COC#: 35017 *ALS Laboratory:* ES Sydney

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

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	1302_SW170_220314	HDPE (no PTFE)	20 mL	00352101042798	Grey	No	
001	1302_SW170_220314	HDPE (no PTFE)	20 mL	00352101042780	Grey	No	
002	1302_QC100_220314	HDPE (no PTFE)	20 mL	00352101042840	Grey	No	
002	1302_QC100_220314	HDPE (no PTFE)	20 mL	00352101042828	Grey	No	
003	1302_QC200_220314	HDPE (no PTFE)	20 mL	00350219023426	Grey	No	
003	1302_QC200_220314	HDPE (no PTFE)	20 mL	00352101042867	Grey	No	
003	1302_QC200_220314	HDPE (no PTFE)	20 mL	00352101042605	Grey	No	
004	1302_QC400_220314	HDPE (no PTFE)	20 mL	00352101042859	Grey	No	
004	1302_QC400_220314	HDPE (no PTFE)	20 mL	00352101042782	Grey	No	
005	1302_SW152_220314	HDPE (no PTFE)	20 mL	00352101042595	Grey	No	
005	1302_SW152_220314	HDPE (no PTFE)	20 mL	00352101042678	Grey	No	
006	1302_QC500_220314	HDPE (no PTFE)	20 mL	00352101042647	Grey	No	
006	1302_QC500_220314	HDPE (no PTFE)	20 mL	00352101042695	Grey	No	
007	1302_QC300_220314	HDPE (no PTFE)	20 mL	00352101042746	Grey	No	
007	1302_QC300_220314	HDPE (no PTFE)	20 mL	00352101042834	Grey	No	
008	1302_SW178_220314	HDPE (no PTFE)	20 mL	00352101042726	Grey	No	
008	1302_SW178_220314	HDPE (no PTFE)	20 mL	00352101042585	Grey	No	
009	1302_SW181_220314	HDPE (no PTFE)	20 mL	00352101042680	Grey	No	
009	1302_SW181_220314	HDPE (no PTFE)	20 mL	00352101041980	Grey	No	
010	1302_SW162_220314	HDPE (no PTFE)	20 mL	00352101042597	Grey	No	
010	1302_SW162_220314	HDPE (no PTFE)	20 mL	00352101042603	Grey	No	
011	1302_SW109_220314	HDPE (no PTFE)	20 mL	00352101042878	Grey	No	
011	1302_SW109_220314	HDPE (no PTFE)	20 mL	00352101042826	Grey	No	
012	1302_SW114_220314	HDPE (no PTFE)	20 mL	00352101042641	Grey	No	
012	1302_SW114_220314	HDPE (no PTFE)	20 mL	00352101042815	Grey	No	
013	1302_SW115_220314	HDPE (no PTFE)	20 mL	00352101042832	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 35017 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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:

013	1302_SW115_220314	HDPE (no PTFE)	20 mL	00352101042635	Grey	No	
014	1302_SW125_220315	HDPE (no PTFE)	20 mL	00352101042794	Grey	No	
014	1302_SW125_220315	HDPE (no PTFE)	20 mL	00352101042803	Grey	No	
015	1302_SW120_220315	HDPE (no PTFE)	20 mL	00352101042858	Grey	No	
015	1302_SW120_220315	HDPE (no PTFE)	20 mL	00352101042829	Grey	No	
016	1302_SW168_220315	HDPE (no PTFE)	20 mL	00352101042763	Grey	No	
016	1302_SW168_220315	HDPE (no PTFE)	20 mL	00352101042706	Grey	No	
017	1302_QC101_220315	HDPE (no PTFE)	20 mL	00352101042802	Grey	No	
017	1302_QC101_220315	HDPE (no PTFE)	20 mL	00352101042823	Grey	No	
018	1302_QC401_220315	HDPE (no PTFE)	20 mL	00352101042867	Grey	No	
018	1302_QC401_220315	HDPE (no PTFE)	20 mL	00352101042817	Grey	No	
019	1302_QC301_220315	HDPE (no PTFE)	20 mL	00352101042745	Grey	No	
019	1302_QC301_220315	HDPE (no PTFE)	20 mL	00352101042729	Grey	No	
020	1302_SW106_220315	HDPE (no PTFE)	20 mL	00352101042659	Grey	No	
020	1302_SW106_220315	HDPE (no PTFE)	20 mL	00352101042751	Grey	No	
021	1302_QC201_220315	HDPE (no PTFE)	20 mL	00352106015322	Grey	No	
021	1302_QC201_220315	HDPE (no PTFE)	20 mL	00352101042689	Grey	No	
021	1302_QC201_220315	HDPE (no PTFE)	20 mL	00352101042784	Grey	No	
022	1302_SW108_220315	HDPE (no PTFE)	20 mL	00352101042732	Grey	No	
022	1302_SW108_220315	HDPE (no PTFE)	20 mL	00352101042735	Grey	No	
023	1302_SW132_220315	HDPE (no PTFE)	20 mL	00352101042879	Grey	No	
023	1302_SW132_220315	HDPE (no PTFE)	20 mL	00352101042620	Grey	No	
024	1302_SW133_220315	HDPE (no PTFE)	20 mL	00352101042820	Grey	No	
024	1302_SW133_220315	HDPE (no PTFE)	20 mL	00352101042862	Grey	No	
025	1302_SW113_220316	HDPE (no PTFE)	20 mL	00352101042864	Grey	No	
025	1302_SW113_220316	HDPE (no PTFE)	20 mL	00352101042875	Grey	No	
026	1302_QC302_220316	HDPE (no PTFE)	20 mL	00352101042590	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 35017 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP

SITE: 1302_RAAFDARWIN

ORDER NO:

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	1302_QC302_220316	HDPE (no PTFE)	20 mL	00352101042756	Grey	No	
027	1302_QC402_220316	HDPE (no PTFE)	20 mL	00352101042683	Grey	No	
027	1302_QC402_220316	HDPE (no PTFE)	20 mL	00352101042806	Grey	No	
028	1302_SW112_220316	HDPE (no PTFE)	20 mL	00352101042810	Grey	No	
028	1302_SW112_220316	HDPE (no PTFE)	20 mL	00352101042677	Grey	No	
029	1302_SW124_220316	HDPE (no PTFE)	20 mL	00352101042690	Grey	No	
029	1302_SW124_220316	HDPE (no PTFE)	20 mL	00352101042656	Grey	No	
030	1302_SW143_220316	HDPE (no PTFE)	20 mL	00352101042725	Grey	No	
030	1302_SW143_220316	HDPE (no PTFE)	20 mL	00352101042781	Grey	No	

Total Bottle Count: ALS: 62, Non ALS: 0

[redacted]

From: [redacted]
Sent:
To:
Subject:

[redacted]

Yes please, can you please request the analysis of PFAS for QC200 as per the COC.

Thanks,

[redacted]

I acknowledge the Traditional Custodians of the country throughout Australia and pay my respect to them, their Culture and their Elders past, present and emerging.

Please consider the environment before printing this email.

[redacted]

Please open and read the SRN for an estimated reporting date and advise if there are any issues.

Please note the following comments regarding your samples:

Sample 1302_QC201_220315 (N22/006478) sample is on hold as per attached COC
Please advise if you want to test this sample.

Regards,

[redacted]

[redacted]

Supporting economic growth and job creation for all Australians | We are collaborative, innovative, respectful and strive for excellence

Acknowledgement of Country

Our department recognises the First Peoples of this nation and their ongoing connection to culture and country. We acknowledge First Nations Peoples as the Traditional Owners, Custodians and Lore Keepers of the world's oldest living culture and pay respects to their Elders past, present and emerging.

[redacted]

Sorry for the confusion.. yes please!

What is the estimated time for reporting of these results. A mishap from the ALS lab not forwarding them onto NMI sooner but we are needing these results ASAP.

Thanks,

[redacted]

I acknowledge the Traditional Custodians of the country throughout Australia and pay my respect to them, their Culture and their Elders past, present and emerging.

Please consider the environment before printing this email.

[redacted]

Sample QC200 ok QC201 is in question.

Do you want QC201 to be analyse?

Regards

[redacted]

OFFICIAL: Sensitive

[redacted]

[redacted]

Yes please, can you please request the analysis of PFAS for QC200 as per the COC.

Thanks,

[redacted]

I acknowledge the Traditional Custodians of the country throughout Australia and pay my respect to them, their Culture and their Elders past, present and emerging.

Please consider the environment before printing this email.

[redacted]

Please open and read the SRN for an estimated reporting date and advise if there are any issues.

Please note the following comments regarding your samples:

Sample 1302_QC201_220315 (N22/006478) sample is on hold as per attached COC
Please advise if you want to test this sample.

Regards,

[redacted]

Acknowledgement of Country

Our department recognises the First Peoples of this nation and their ongoing connection to culture and country. We acknowledge First Nations Peoples as the Traditional Owners, Custodians and Lore Keepers of the world's oldest living culture and pay respects to their Elders past, present and emerging.

Appendix F

Laboratory Certificates

Appendix F Laboratory Certificates

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2208419**	Page	: 1 of 9
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 11-Mar-2022
Site	: 1302_RAAFDARWIN	Issue Date	: 21-Mar-2022
Sampler	: [redacted]	No. of samples received	: 44
Order number	: -	No. of samples analysed	: 44

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							
EP231A: Perfluoroalkyl Sulfonic Acids	ES2208419--041	1302_MW454_220309	**Perfluorobutane sulfonic acid (PFBS)**	375-73-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	ES2208419--041	1302_MW454_220309	**Perfluoropentane sulfonic acid (PFPeS)**	2706-91-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	ES2208419--041	1302_MW454_220309	**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	ES2208419--041	1302_MW454_220309	**Perfluoroheptane sulfonic acid (PFHpS)**	375-92-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	ES2208419--041	1302_MW454_220309	**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	ES2208419--041	1302_MW454_220309	**Perfluorohexanoic acid (PFHxA)**	307-24-4	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	3	59	5.08	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	2	59	3.39	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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1302_MW128_220307, 1302_QC400_220307, 1302_QC100_220307, 1302_QC500_220307, 1302_MW103_220307, 1302_QC300_220307	**07-Mar-2022**	**15-Mar-2022**	03-Sep-2022	✓	**16-Mar-2022**	03-Sep-2022	✓
HDPE (no PTFE) (EP231X) 1302_QC401_220308, 1302_MW176_220308, 1302_MW200_220308, 1302_MW211_220308, 1302_MW180_220308, 1302_MW201_220308, 1302_MW452_220308, 1302_MW451_220308, 1302_QC301_220308, 1302_MW133_220308, 1302_MW303_220308, 1302_QC101_220308, 1302_MW297_220308, 1302_MW185_220308, 1302_MW195_220308, 1302_MW194_220308, 1302_MW190_220308, 1302_MW191_220308, 1302_MW210_220308, 1302_MW209_220308	**08-Mar-2022**	**15-Mar-2022**	04-Sep-2022	✓	**16-Mar-2022**	04-Sep-2022	✓
HDPE (no PTFE) (EP231X) 1302_MW107_220309, 1302_QC402_220309, 1302_MW241_220309, 1302_QC102_220309, 1302_MW197_220309, 1302_MW240_220309, 1302_MW453_220309, 1302_MW144_220309, 1302_MW141_220309, 1302_QC103_220309, 1302_MW139_220309, 1302_MW422_220309, 1302_MW454_220309	**09-Mar-2022**	**15-Mar-2022**	05-Sep-2022	✓	**16-Mar-2022**	05-Sep-2022	✓
HDPE (no PTFE) (EP231X) 1302_MW112_220310	**10-Mar-2022**	**15-Mar-2022**	06-Sep-2022	✓	**16-Mar-2022**	06-Sep-2022	✓
HDPE (no PTFE) (EP231X) 1302_QC403_220310, 1302_MW205_220310, 1302_MW115_220310, 1302_MW156_220310	**10-Mar-2022**	**16-Mar-2022**	06-Sep-2022	✓	**17-Mar-2022**	06-Sep-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
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_MW128_220307, 1302_QC400_220307, 1302_QC100_220307, 1302_QC500_220307, 1302_MW103_220307, 1302_QC300_220307	**07-Mar-2022**	**15-Mar-2022**	03-Sep-2022	✓	**16-Mar-2022**	03-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC401_220308, 1302_MW176_220308, 1302_MW200_220308, 1302_MW211_220308, 1302_MW180_220308, 1302_MW201_220308, 1302_MW452_220308, 1302_MW451_220308, 1302_QC301_220308, 1302_MW133_220308, 1302_MW303_220308, 1302_QC101_220308, 1302_MW297_220308, 1302_MW185_220308, 1302_MW195_220308, 1302_MW194_220308, 1302_MW190_220308, 1302_MW191_220308, 1302_MW210_220308, 1302_MW209_220308	**08-Mar-2022**	**15-Mar-2022**	04-Sep-2022	✓	**16-Mar-2022**	04-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_MW107_220309, 1302_QC402_220309, 1302_MW241_220309, 1302_QC102_220309, 1302_MW197_220309, 1302_MW240_220309, 1302_MW453_220309, 1302_MW144_220309, 1302_MW141_220309, 1302_QC103_220309, 1302_MW139_220309, 1302_MW422_220309, 1302_MW454_220309	**09-Mar-2022**	**15-Mar-2022**	05-Sep-2022	✓	**16-Mar-2022**	05-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_MW112_220310	**10-Mar-2022**	**15-Mar-2022**	06-Sep-2022	✓	**16-Mar-2022**	06-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC403_220310, 1302_MW205_220310, 1302_MW115_220310, 1302_MW156_220310	**10-Mar-2022**	**16-Mar-2022**	06-Sep-2022	✓	**17-Mar-2022**	06-Sep-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
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
1302_MW128_220307, 1302_QC400_220307, 1302_QC100_220307, 1302_QC500_220307, 1302_MW103_220307, 1302_QC300_220307	**07-Mar-2022**	**15-Mar-2022**	03-Sep-2022	✓	**16-Mar-2022**	03-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC401_220308, 1302_MW176_220308, 1302_MW200_220308, 1302_MW211_220308, 1302_MW180_220308, 1302_MW201_220308, 1302_MW452_220308, 1302_MW451_220308, 1302_QC301_220308, 1302_MW133_220308, 1302_MW303_220308, 1302_QC101_220308, 1302_MW297_220308, 1302_MW185_220308, 1302_MW195_220308, 1302_MW194_220308, 1302_MW190_220308, 1302_MW191_220308, 1302_MW210_220308, 1302_MW209_220308	**08-Mar-2022**	**15-Mar-2022**	04-Sep-2022	✓	**16-Mar-2022**	04-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_MW107_220309, 1302_QC402_220309, 1302_MW241_220309, 1302_QC102_220309, 1302_MW197_220309, 1302_MW240_220309, 1302_MW453_220309, 1302_MW144_220309, 1302_MW141_220309, 1302_QC103_220309, 1302_MW139_220309, 1302_MW422_220309, 1302_MW454_220309	**09-Mar-2022**	**15-Mar-2022**	05-Sep-2022	✓	**16-Mar-2022**	05-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_MW112_220310	**10-Mar-2022**	**15-Mar-2022**	06-Sep-2022	✓	**16-Mar-2022**	06-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC403_220310, 1302_MW205_220310, 1302_MW115_220310, 1302_MW156_220310	**10-Mar-2022**	**16-Mar-2022**	06-Sep-2022	✓	**17-Mar-2022**	06-Sep-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
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_MW128_220307, 1302_QC400_220307, 1302_QC100_220307, 1302_QC500_220307, 1302_MW103_220307, 1302_QC300_220307	**07-Mar-2022**	**15-Mar-2022**	03-Sep-2022	✓	**16-Mar-2022**	03-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC401_220308, 1302_MW176_220308, 1302_MW200_220308, 1302_MW211_220308, 1302_MW180_220308, 1302_MW201_220308, 1302_MW452_220308, 1302_MW451_220308, 1302_QC301_220308, 1302_MW133_220308, 1302_MW303_220308, 1302_QC101_220308, 1302_MW297_220308, 1302_MW185_220308, 1302_MW195_220308, 1302_MW194_220308, 1302_MW190_220308, 1302_MW191_220308, 1302_MW210_220308, 1302_MW209_220308	**08-Mar-2022**	**15-Mar-2022**	04-Sep-2022	✓	**16-Mar-2022**	04-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_MW107_220309, 1302_QC402_220309, 1302_MW241_220309, 1302_QC102_220309, 1302_MW197_220309, 1302_MW240_220309, 1302_MW453_220309, 1302_MW144_220309, 1302_MW141_220309, 1302_QC103_220309, 1302_MW139_220309, 1302_MW422_220309, 1302_MW454_220309	**09-Mar-2022**	**15-Mar-2022**	05-Sep-2022	✓	**16-Mar-2022**	05-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_MW112_220310	**10-Mar-2022**	**15-Mar-2022**	06-Sep-2022	✓	**16-Mar-2022**	06-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC403_220310, 1302_MW205_220310, 1302_MW115_220310, 1302_MW156_220310	**10-Mar-2022**	**16-Mar-2022**	06-Sep-2022	✓	**17-Mar-2022**	06-Sep-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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_MW128_220307, 1302_QC400_220307, 1302_QC100_220307, 1302_QC500_220307, 1302_MW103_220307, 1302_QC300_220307	**07-Mar-2022**	**15-Mar-2022**	03-Sep-2022	✓	**16-Mar-2022**	03-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC401_220308, 1302_MW176_220308, 1302_MW200_220308, 1302_MW211_220308, 1302_MW180_220308, 1302_MW201_220308, 1302_MW452_220308, 1302_MW451_220308, 1302_QC301_220308, 1302_MW133_220308, 1302_MW303_220308, 1302_QC101_220308, 1302_MW297_220308, 1302_MW185_220308, 1302_MW195_220308, 1302_MW194_220308, 1302_MW190_220308, 1302_MW191_220308, 1302_MW210_220308, 1302_MW209_220308	**08-Mar-2022**	**15-Mar-2022**	04-Sep-2022	✓	**16-Mar-2022**	04-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_MW107_220309, 1302_QC402_220309, 1302_MW241_220309, 1302_QC102_220309, 1302_MW197_220309, 1302_MW240_220309, 1302_MW453_220309, 1302_MW144_220309, 1302_MW141_220309, 1302_QC103_220309, 1302_MW139_220309, 1302_MW422_220309, 1302_MW454_220309	**09-Mar-2022**	**15-Mar-2022**	05-Sep-2022	✓	**16-Mar-2022**	05-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_MW112_220310	**10-Mar-2022**	**15-Mar-2022**	06-Sep-2022	✓	**16-Mar-2022**	06-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_QC403_220310, 1302_MW205_220310, 1302_MW115_220310, 1302_MW156_220310	**10-Mar-2022**	**16-Mar-2022**	06-Sep-2022	✓	**17-Mar-2022**	06-Sep-2022	✓

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	59	**5.08**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	59	**5.08**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	59	**5.08**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	59	**3.39**	**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
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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2209679-AA**	Page	: 1 of 13
Amendment	: **2**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted] DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 16-Mar-2022 10:30
Order number	: -	Date Analysis Commenced	: 21-Mar-2022
C-O-C number	: 35017	Issue Date	: 08-Apr-2022 14:49
Sampler	: [redacted]		
Site	: 1302_RAAFDARWIN		
Quote number	: SY/139/19 V3		
No. of samples received	: 24		
No. of samples analysed	: 23		

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*
[redacted]	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 Contact 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.
- Amendment (30/03/2022):This report has been amended following the request for a split report.
- Amendment (08/04/2022):This report has been amended following the removal of results for sample 3 which has been forwarded to NMI.
- 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: RINSATE (Matrix: WATER)				Sample ID	1302_QC300_220314	1302_QC301_220315	1302_QC302_220316	----	----
				Sampling date / time	14-Mar-2022 13:23	15-Mar-2022 15:12	16-Mar-2022 08:54	----	----
Compound	CAS Number	LOR	Unit		ES2209679-007	ES2209679-019	ES2209679-026	--------	--------
					Result	Result	Result	----	----
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	----	----
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	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	1302_QC300_220314	1302_QC301_220315	1302_QC302_220316	----	----
				Sampling date / time	14-Mar-2022 13:23	15-Mar-2022 15:12	16-Mar-2022 08:54	----	----
Compound	CAS Number	LOR	Unit		ES2209679-007	ES2209679-019	ES2209679-026	--------	--------
					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	----	----
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	----	----
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	%		**88.7**	**89.6**	**103**	----	----
13C8-PFOA	----	0.02	%		**102**	**101**	**99.3**	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	1302_SW170_220314	1302_QC100_220314	1302_QC400_220314	1302_SW152_220314	1302_QC500_220314
				Sampling date / time	14-Mar-2022 12:37	14-Mar-2022 12:39	14-Mar-2022 12:40	14-Mar-2022 12:41	14-Mar-2022 12:42
Compound	CAS Number	LOR	Unit		ES2209679-001	ES2209679-002	ES2209679-004	ES2209679-005	ES2209679-006
					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		**0.15**	**0.15**	<0.01	**0.06**	<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		**0.33**	**0.34**	<0.01	**0.16**	<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		**0.04**	**0.04**	<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: SURFACE WATER (Matrix: WATER)				Sample ID	1302_SW170_220314	1302_QC100_220314	1302_QC400_220314	1302_SW152_220314	1302_QC500_220314
				Sampling date / time	14-Mar-2022 12:37	14-Mar-2022 12:39	14-Mar-2022 12:40	14-Mar-2022 12:41	14-Mar-2022 12:42
Compound	CAS Number	LOR	Unit		ES2209679-001	ES2209679-002	ES2209679-004	ES2209679-005	ES2209679-006
					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		**0.52**	**0.53**	<0.01	**0.22**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.48**	**0.49**	<0.01	**0.22**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.52**	**0.53**	<0.01	**0.22**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.7**	**86.7**	**89.6**	**97.2**	**95.2**
13C8-PFOA	----	0.02	%		**108**	**104**	**106**	**104**	**105**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	1302_SW178_220314	1302_SW181_220314	1302_SW162_220314	1302_SW125_220315	1302_SW120_220315
				Sampling date / time	14-Mar-2022 13:24	14-Mar-2022 13:32	14-Mar-2022 14:20	15-Mar-2022 14:28	15-Mar-2022 14:39
Compound	CAS Number	LOR	Unit		ES2209679-008	ES2209679-009	ES2209679-010	ES2209679-014	ES2209679-015
					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	**0.16**	**0.04**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	**0.14**	**0.03**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.06**	<0.01	**1.48**	**0.34**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	**0.09**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**0.23**	**0.01**	**2.88**	**0.54**
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	**0.07**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.03**	<0.02	**0.31**	**0.08**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	**0.04**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.08**	**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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	1302_SW178_220314	1302_SW181_220314	1302_SW162_220314	1302_SW125_220315	1302_SW120_220315
				Sampling date / time	14-Mar-2022 13:24	14-Mar-2022 13:32	14-Mar-2022 14:20	15-Mar-2022 14:28	15-Mar-2022 14:39
Compound	CAS Number	LOR	Unit		ES2209679-008	ES2209679-009	ES2209679-010	ES2209679-014	ES2209679-015
					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	**0.32**	**0.01**	**5.25**	**1.05**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.29**	**0.01**	**4.36**	**0.88**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.32**	**0.01**	**5.02**	**1.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.5**	**89.6**	**95.3**	**90.4**	**91.3**
13C8-PFOA	----	0.02	%		**103**	**103**	**105**	**104**	**104**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_QC101_220315	1302_QC401_220315	1302_SW106_220315	1302_SW132_220315	1302_SW133_220315
				Sampling date / time	15-Mar-2022 15:11	15-Mar-2022 15:12	15-Mar-2022 15:39	15-Mar-2022 16:24	15-Mar-2022 16:49
					ES2209679-017	ES2209679-018	ES2209679-020	ES2209679-023	ES2209679-024
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.05**	<0.02	**0.03**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.05**	<0.02	**0.02**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.30**	<0.01	**0.20**	**0.07**	**0.06**
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		**0.46**	<0.01	**0.34**	**0.13**	**0.05**
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		**0.03**	<0.02	<0.02	<0.02	**0.04**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.11**	<0.02	**0.06**	<0.02	**0.03**
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		**0.04**	<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: SURFACE WATER (Matrix: WATER)				Sample ID	1302_QC101_220315	1302_QC401_220315	1302_SW106_220315	1302_SW132_220315	1302_SW133_220315
				Sampling date / time	15-Mar-2022 15:11	15-Mar-2022 15:12	15-Mar-2022 15:39	15-Mar-2022 16:24	15-Mar-2022 16:49
Compound	CAS Number	LOR	Unit		ES2209679-017	ES2209679-018	ES2209679-020	ES2209679-023	ES2209679-024
					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		**1.04**	<0.01	**0.66**	**0.20**	**0.19**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.76**	<0.01	**0.54**	**0.20**	**0.11**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.99**	<0.01	**0.64**	**0.20**	**0.19**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.5**	**89.1**	**92.4**	**100**	**104**
13C8-PFOA	----	0.02	%		**104**	**104**	**102**	**97.0**	**103**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW113_220316	1302_QC402_220316	1302_SW112_220316	1302_SW124_220316	1302_SW143_220316
				Sampling date / time	16-Mar-2022 08:53	16-Mar-2022 08:55	16-Mar-2022 09:11	16-Mar-2022 09:36	16-Mar-2022 10:26
					ES2209679-025	ES2209679-027	ES2209679-028	ES2209679-029	ES2209679-030
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	**0.03**	<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		**0.12**	<0.01	**0.21**	**0.03**	**0.06**
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		**0.22**	<0.01	**0.37**	**0.06**	**0.14**
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	**0.04**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.03**	<0.02	**0.06**	<0.02	**0.04**
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

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	1302_SW113_220316	1302_QC402_220316	1302_SW112_220316	1302_SW124_220316	1302_SW143_220316
				Sampling date / time	16-Mar-2022 08:53	16-Mar-2022 08:55	16-Mar-2022 09:11	16-Mar-2022 09:36	16-Mar-2022 10:26
Compound	CAS Number	LOR	Unit		ES2209679-025	ES2209679-027	ES2209679-028	ES2209679-029	ES2209679-030
					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	**0.08**
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		**0.37**	<0.01	**0.70**	**0.09**	**0.40**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.34**	<0.01	**0.58**	**0.09**	**0.20**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.37**	<0.01	**0.68**	**0.09**	**0.38**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.9**	**112**	**100**	**110**	**111**
13C8-PFOA	----	0.02	%		**97.2**	**97.2**	**101**	**102**	**104**

Surrogate Control Limits

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

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2209679-AA**	Page	: 1 of 7
Amendment	: **2**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted] DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 16-Mar-2022
Order number	: -	Date Analysis Commenced	: 21-Mar-2022
C-O-C number	: 35017	Issue Date	: 08-Apr-2022
Sampler	: [redacted]		
Site	: 1302_RAAFDARWIN		
Quote number	: SY/139/19 V3		
No. of samples received	: 24		
No. of samples analysed	: 23		

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*
[redacted]	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 (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4240081)									
ES2209679-003	1302_QC200_220314	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.14	0.17	17.6	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.34	0.37	10.2	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4240081)									
ES2209679-003	1302_QC200_220314	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	0.04	0.04	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: 4240081)									
ES2209679-003	1302_QC200_220314	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: 4240081) - continued									
ES2209679-003	1302_QC200_220314	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: 4240081)									
ES2209679-003	1302_QC200_220314	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: 4240081)									
ES2209679-003	1302_QC200_220314	EP231X: Sum of PFAS	----	0.01	µg/L	0.52	0.59	12.6	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4240081)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	98.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	94.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	89.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	76.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	88.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4240084)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	102	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	89.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	93.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4240081)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	88.9	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	119	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	80.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	92.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	88.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	84.2	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.4	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	73.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	95.5	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4240084)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	93.7	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	91.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	118	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	91.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	100	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	91.4	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	93.0	69.0	133

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: 4240084) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	107	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	127	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4240081)								
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	117	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	111	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	79.6	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	75.8	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4240084)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	95.6	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	92.0	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	97.3	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	99.7	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	80.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4240081)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	92.2	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	92.8	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	80.4	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4240084)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	96.2	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	105	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	98.0	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	92.0	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4240081)							
ES2209679-003	1302_QC200_220314	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	118	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	99.2	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	90.2	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	82.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	84.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4240081)							
ES2209679-003	1302_QC200_220314	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	88.2	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	107	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	112	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	80.6	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	88.6	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	85.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	84.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	89.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	101	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	75.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4240081)							
ES2209679-003	1302_QC200_220314	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	108	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	102	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	100	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	106	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	84.7	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	92.0	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	83.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4240081)							
ES2209679-003	1302_QC200_220314	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	81.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	104	64.0	140

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: 4240081) - continued							
ES2209679-003	1302_QC200_220314	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	84.4	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	89.4	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2209679**	Page	: 1 of 6
Amendment	: **2**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 16-Mar-2022
Site	: 1302_RAAFDARWIN	Issue Date	: 08-Apr-2022
Sampler	: [redacted]	No. of samples received	: 30
Order number	: -	No. of samples analysed	: 28

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

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

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	1	38	2.63	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	38	2.63	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*
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW170_220314, 1302_QC100_220314, 1302_QC400_220314, 1302_SW152_220314, 1302_QC500_220314, 1302_QC300_220314, 1302_SW178_220314, 1302_SW181_220314, 1302_SW162_220314, 1302_SW109_220314, 1302_SW114_220314, 1302_SW115_220314	**14-Mar-2022**	**22-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	10-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW125_220315, 1302_SW120_220315, 1302_SW168_220315, 1302_QC101_220315, 1302_QC401_220315, 1302_QC301_220315, 1302_SW106_220315, 1302_SW108_220315, 1302_SW132_220315, 1302_SW133_220315	**15-Mar-2022**	**22-Mar-2022**	11-Sep-2022	✓	**22-Mar-2022**	11-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW113_220316, 1302_QC302_220316, 1302_QC402_220316, 1302_SW112_220316, 1302_SW124_220316, 1302_SW143_220316	**16-Mar-2022**	**22-Mar-2022**	12-Sep-2022	✓	**22-Mar-2022**	12-Sep-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
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW170_220314, 1302_QC100_220314, 1302_QC400_220314, 1302_SW152_220314, 1302_QC500_220314, 1302_QC300_220314, 1302_SW178_220314, 1302_SW181_220314, 1302_SW162_220314, 1302_SW109_220314, 1302_SW114_220314, 1302_SW115_220314	**14-Mar-2022**	**22-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	10-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW125_220315, 1302_SW120_220315, 1302_SW168_220315, 1302_QC101_220315, 1302_QC401_220315, 1302_QC301_220315, 1302_SW106_220315, 1302_SW108_220315, 1302_SW132_220315, 1302_SW133_220315	**15-Mar-2022**	**22-Mar-2022**	11-Sep-2022	✓	**22-Mar-2022**	11-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW113_220316, 1302_QC302_220316, 1302_QC402_220316, 1302_SW112_220316, 1302_SW124_220316, 1302_SW143_220316	**16-Mar-2022**	**22-Mar-2022**	12-Sep-2022	✓	**22-Mar-2022**	12-Sep-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
1302_SW170_220314, 1302_QC100_220314, 1302_QC400_220314, 1302_SW152_220314, 1302_QC500_220314, 1302_QC300_220314, 1302_SW178_220314, 1302_SW181_220314, 1302_SW162_220314, 1302_SW109_220314, 1302_SW114_220314, 1302_SW115_220314	**14-Mar-2022**	**22-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	10-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW125_220315, 1302_SW120_220315, 1302_SW168_220315, 1302_QC101_220315, 1302_QC401_220315, 1302_QC301_220315, 1302_SW106_220315, 1302_SW108_220315, 1302_SW132_220315, 1302_SW133_220315	**15-Mar-2022**	**22-Mar-2022**	11-Sep-2022	✓	**22-Mar-2022**	11-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW113_220316, 1302_QC302_220316, 1302_QC402_220316, 1302_SW112_220316, 1302_SW124_220316, 1302_SW143_220316	**16-Mar-2022**	**22-Mar-2022**	12-Sep-2022	✓	**22-Mar-2022**	12-Sep-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
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW170_220314, 1302_QC100_220314, 1302_QC400_220314, 1302_SW152_220314, 1302_QC500_220314, 1302_QC300_220314, 1302_SW178_220314, 1302_SW181_220314, 1302_SW162_220314, 1302_SW109_220314, 1302_SW114_220314, 1302_SW115_220314	**14-Mar-2022**	**22-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	10-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW125_220315, 1302_SW120_220315, 1302_SW168_220315, 1302_QC101_220315, 1302_QC401_220315, 1302_QC301_220315, 1302_SW106_220315, 1302_SW108_220315, 1302_SW132_220315, 1302_SW133_220315	**15-Mar-2022**	**22-Mar-2022**	11-Sep-2022	✓	**22-Mar-2022**	11-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW113_220316, 1302_QC302_220316, 1302_QC402_220316, 1302_SW112_220316, 1302_SW124_220316, 1302_SW143_220316	**16-Mar-2022**	**22-Mar-2022**	12-Sep-2022	✓	**22-Mar-2022**	12-Sep-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_SW170_220314, 1302_QC100_220314, 1302_QC400_220314, 1302_SW152_220314, 1302_QC500_220314, 1302_QC300_220314, 1302_SW178_220314, 1302_SW181_220314, 1302_SW162_220314, 1302_SW109_220314, 1302_SW114_220314, 1302_SW115_220314	**14-Mar-2022**	**22-Mar-2022**	10-Sep-2022	✓	**22-Mar-2022**	10-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW125_220315, 1302_SW120_220315, 1302_SW168_220315, 1302_QC101_220315, 1302_QC401_220315, 1302_QC301_220315, 1302_SW106_220315, 1302_SW108_220315, 1302_SW132_220315, 1302_SW133_220315	**15-Mar-2022**	**22-Mar-2022**	11-Sep-2022	✓	**22-Mar-2022**	11-Sep-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW113_220316, 1302_QC302_220316, 1302_QC402_220316, 1302_SW112_220316, 1302_SW124_220316, 1302_SW143_220316	**16-Mar-2022**	**22-Mar-2022**	12-Sep-2022	✓	**22-Mar-2022**	12-Sep-2022	✓

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	38	**2.63**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	38	**2.63**	**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
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.

REPORT OF ANALYSIS

Report No. RN1340447

Client	: AECOM AUSTRALIA PTY LTD	**Job No.**	: AECO06/220119
	LEVEL 8	**Quote No.**	: QT-02018
	540 WICKHAM STREET	**Order No.**	:
		Date Received	: 19-JAN-2022
Attention	: [redacted]	**Sampled By**	: CLIENT
Project Name	: 1302_RAAF_DARWIN		
Your Client Services Manager	: [redacted]	**Phone**	: [redacted]

Lab Reg No.	Sample Ref	Sample Description
N22/001013	1302_QC200_220113	WATER 13/01/2022 02:22 PM
N22/001014	1302_QC201_220117	WATER 17/01/2022 03:48 PM

Lab Reg No.		N22/001013	N22/001014			
Date Sampled		13-JAN-2022	17-JAN-2022			
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05	<0.05			NR70
PFPeA (2706-90-3)	ug/L	<0.02	<0.02			NR70
PFHxA (307-24-4)	ug/L	0.010	<0.01			NR70
PFHpA (375-85-9)	ug/L	<0.01	<0.01			NR70
PFOA (335-67-1)	ug/L	<0.01	<0.01			NR70
PFNA (375-95-1)	ug/L	<0.01	<0.01			NR70
PFDA (335-76-2)	ug/L	<0.01	<0.01			NR70
PFUdA (2058-94-8)	ug/L	<0.01	<0.01			NR70
PFDoA (307-55-1)	ug/L	<0.01	<0.01			NR70
PFTrDA (72629-94-8)	ug/L	<0.02	<0.02			NR70
PFTeDA (376-06-7)	ug/L	<0.02	<0.02			NR70
PFHxDA (67905-19-5)	ug/L	<0.02	<0.02			NR70
PFODA (16517-11-6)	ug/L	<0.05	<0.05			NR70
FOUEA (70887-84-2)	ug/L	<0.01	<0.01			NR70
PFDS (335-77-3)	ug/L	<0.01	<0.01			NR70
PFPeS (2706-91-4)	ug/L	<0.01	<0.01			NR70
PFHxS (355-46-4)	ug/L	0.081	0.030			NR70
PFHpS (375-92-8)	ug/L	<0.01	<0.01			NR70
PFOS (1763-23-1)	ug/L	0.19	0.13			NR70
PFNS (68259-12-1)	ug/L	<0.01	<0.01			NR70
PFBS (375-73-5)	ug/L	<0.01	<0.01			NR70
PFOSA (754-91-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02	<0.02			NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02	<0.02			NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01	<0.01			NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05	<0.05			NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05			NR70
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01			NR70

REPORT OF ANALYSIS

Lab Reg No.		N22/001013	N22/001014			
Date Sampled		13-JAN-2022	17-JAN-2022			
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
6:2 FTS (27619-97-2)	ug/L	<0.01	<0.01			NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01			NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01			NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02			NR70
PFBA (Surrogate Recovery)	%	118	123			NR70
PFPeA (Surrogate Recovery)	%	120	126			NR70
PFHxA (Surrogate Recovery)	%	114	117			NR70
PFHpA (Surrogate Recovery)	%	109	104			NR70
PFOA (Surrogate Recovery)	%	119	119			NR70
PFNA (Surrogate Recovery)	%	126	128			NR70
PFDA (Surrogate Recovery)	%	105	128			NR70
PFUdA (Surrogate Recovery)	%	54	56			NR70
PFDoA (Surrogate Recovery)	%	74	70			NR70
PFTeDA (Surrogate Recovery)	%	104	131			NR70
PFHxDA (Surrogate Recovery)	%	117	114			NR70
FOUEA (Surrogate Recovery)	%	93	84			NR70
PFBS (Surrogate Recovery)	%	110	113			NR70
PFHxS (Surrogate Recovery)	%	109	110			NR70
PFOS (Surrogate Recovery)	%	113	122			NR70
PFOSA (Surrogate Recovery)	%	83	75			NR70
N-MeFOSA (Surrogate Recovery)	%	85	72			NR70
N-EtFOSA (Surrogate Recovery)	%	95	85			NR70
N-MeFOSAA (Surrogate Recovery)	%	96	83			NR70
N-EtFOSAA (Surrogate Recovery)	%	46	53			NR70
N-MeFOSE (Surrogate Recovery)	%	72	58			NR70
N-EtFOSE (Surrogate Recovery)	%	162	121			NR70
4:2 FTS (Surrogate Recovery)	%	103	109			NR70
6:2 FTS (Surrogate Recovery)	%	115	110			NR70
8:2 FTS (Surrogate Recovery)	%	101	101			NR70
8:2 diPAP (Surrogate Recovery)	%	84	105			NR70
Dates						
Date extracted		21-JAN-2022	21-JAN-2022			
Date analysed		21-JAN-2022	21-JAN-2022			

N22/001013
to
N22/001014

PFOS and PFHxS are quantified using a combined branched and linear standard,

REPORT OF ANALYSIS

linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

Selected PFAS surrogate recoveries are biased due to matrix effects.ô
High PFAS surrogate recoveries accepted - results corrected for recovery.
Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N >10.

[redacted]
Organics - NSW
Accreditation No. 198

27-JAN-2022

ACCREDITED FOR TECHNICAL COMPETENCE

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1340440*

Measurement Uncertainty is available upon request.
Chemical Accreditation 198: 105 Delhi Road, North Ryde, NSW, 2113

REPORT OF ANALYSIS

Report No. RN1346368

Client	: AECOM AUSTRALIA PTY LTD	**Job No.**	: AECO06/220316
	LEVEL 8	**Quote No.**	: QT-02018
	540 WICKHAM STREET	**Order No.**	:
		Date Received	: 16-MAR-2022
Attention	: [redacted]	**Sampled By**	: CLIENT
Project Name	: NT_1302_PFASOMP		
Your Client Services Manager	: [redacted]	**Phone**	: 02 9449 0169

Lab Reg No.	Sample Ref	Sample Description
N22/004665	1302_QC200_220307	WATER 07/03/2022 01:58 PM
N22/004666	1302_QC201_220309	WATER 09/03/2022 10:31 AM

Lab Reg No.		N22/004665	N22/004666			
Date Sampled		07-MAR-2022	09-MAR-2022			
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	0.052	0.90			NR70
PFPeA (2706-90-3)	ug/L	0.082	1.3			NR70
PFHxA (307-24-4)	ug/L	0.31	2.4			NR70
PFHpA (375-85-9)	ug/L	0.045	1.8			NR70
PFOA (335-67-1)	ug/L	0.090	1.7			NR70
PFNA (375-95-1)	ug/L	<0.01	0.77			NR70
PFDA (335-76-2)	ug/L	<0.01	0.098			NR70
PFUdA (2058-94-8)	ug/L	<0.01	<0.01			NR70
PFDoA (307-55-1)	ug/L	<0.01	<0.01			NR70
PFTrDA (72629-94-8)	ug/L	<0.02	<0.02			NR70
PFTeDA (376-06-7)	ug/L	<0.02	<0.02			NR70
PFHxDA (67905-19-5)	ug/L	<0.02	<0.02			NR70
PFODA (16517-11-6)	ug/L	<0.05	<0.05			NR70
FOUEA (70887-84-2)	ug/L	<0.01	<0.01			NR70
PFDS (335-77-3)	ug/L	<0.01	<0.01			NR70
PFPeS (2706-91-4)	ug/L	0.14	0.94			NR70
PFHxS (355-46-4)	ug/L	0.98	3.9			NR70
PFHpS (375-92-8)	ug/L	0.088	0.49			NR70
PFOS (1763-23-1)	ug/L	2.7	12			NR70
PFNS (68259-12-1)	ug/L	<0.01	0.011			NR70
PFBS (375-73-5)	ug/L	0.14	0.65			NR70
PFOSA (754-91-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02	<0.02			NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02	<0.02			NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01	<0.01			NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01	<0.01			NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05	<0.05			NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05			NR70
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01			NR70

REPORT OF ANALYSIS

Lab Reg No.		N22/004665	N22/004666			
Date Sampled		07-MAR-2022	09-MAR-2022			
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
6:2 FTS (27619-97-2)	ug/L	<0.01	0.35			NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	0.75			NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01			NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02			NR70
PFBA (Surrogate Recovery)	%	85	113			NR70
PFPeA (Surrogate Recovery)	%	87	108			NR70
PFHxA (Surrogate Recovery)	%	88	112			NR70
PFHpA (Surrogate Recovery)	%	88	106			NR70
PFOA (Surrogate Recovery)	%	88	98			NR70
PFNA (Surrogate Recovery)	%	75	68			NR70
PFDA (Surrogate Recovery)	%	71	123			NR70
PFUdA (Surrogate Recovery)	%	100	119			NR70
PFDoA (Surrogate Recovery)	%	87	96			NR70
PFTeDA (Surrogate Recovery)	%	159	99			NR70
PFHxDA (Surrogate Recovery)	%	53	259			NR70
FOUEA (Surrogate Recovery)	%	67	73			NR70
PFBS (Surrogate Recovery)	%	79	110			NR70
PFHxS (Surrogate Recovery)	%	97	108			NR70
PFOS (Surrogate Recovery)	%	115	114			NR70
PFOSA (Surrogate Recovery)	%	70	86			NR70
N-MeFOSA (Surrogate Recovery)	%	66	68			NR70
N-EtFOSA (Surrogate Recovery)	%	68	71			NR70
N-MeFOSAA (Surrogate Recovery)	%	68	87			NR70
N-EtFOSAA (Surrogate Recovery)	%	75	88			NR70
N-MeFOSE (Surrogate Recovery)	%	37	54			NR70
N-EtFOSE (Surrogate Recovery)	%	60	65			NR70
4:2 FTS (Surrogate Recovery)	%	81	77			NR70
6:2 FTS (Surrogate Recovery)	%	77	73			NR70
8:2 FTS (Surrogate Recovery)	%	70	108			NR70
8:2 diPAP (Surrogate Recovery)	%	65	80			NR70
Dates						
Date extracted		18-MAR-2022	18-MAR-2022			
Date analysed		18-MAR-2022	18-MAR-2022			

N22/004665
to
N22/004666

PFOS and PFHxS are quantified using a combined branched and linear standard,

REPORT OF ANALYSIS

linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

Selected PFAS surrogate recoveries are biased due to matrix effects.ô
High PFAS surrogate recoveries accepted - results corrected for recovery.
Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N >10.

[redacted]

Organics - NSW
Accreditation No. 198

23-MAR-2022

NATA
ACCREDITED FOR
TECHNICAL
COMPETENCE

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1346358*

Measurement Uncertainty is available upon request.
Chemical Accreditation 198: 105 Delhi Road, North Ryde, NSW, 2113

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/220119 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
				N22/001013				
PFBA (375-22-4)	NR70	0.05	<0.05	<0.05	<0.05	-	99	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	<0.02	<0.02	-	83	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	0.010	<0.01	-	88	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	<0.01	<0.01	-	93	NA
PFOA (335-67-1)	NR70	0.01	<0.01	<0.01	<0.01	-	78	NA
PFNA (375-95-1)	NR70	0.01	<0.01	<0.01	<0.01	-	88	NA
PFDA (335-76-2)	NR70	0.01	<0.01	<0.01	<0.01	-	84	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	<0.01	<0.01	-	96	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	<0.01	<0.01	-	86	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	<0.02	<0.02	-	108	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	<0.02	<0.02	-	86	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	<0.02	<0.02	-	84	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	<0.05	<0.05	-	74	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	<0.01	<0.01	-	93	NA
PFBS (375-73-5)	NR70	0.01	<0.01	<0.01	<0.01	-	85	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	<0.01	<0.01	-	83	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	0.081	0.075	8.0	82	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	<0.01	<0.01	-	86	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	0.19	0.18	5.0	87	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	<0.01	<0.01	-	83	NA
PFDS (335-77-3)	NR70	0.01	<0.01	<0.01	<0.01	-	76	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	<0.01	<0.01	-	84	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	<0.02	<0.02	-	89	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	<0.02	<0.02	-	95	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	<0.01	<0.01	-	84	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	<0.01	<0.01	-	81	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	<0.05	<0.05	-	105	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	<0.05	<0.05	-	54	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	<0.01	<0.01	-	94	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	<0.01	<0.01	-	91	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	<0.01	<0.01	-	82	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	<0.01	<0.01	-	93	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	<0.02	<0.02	-	92	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference.

Signed: [redacted]

[redacted]
Organics Manager, NMI-North Ryde

Date: **21/01/2022**

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/220316 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	96	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	90	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	92	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	92	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	88	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	111	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	83	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	70	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	82	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	55	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	71	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	61	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	55	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	85	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	92	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	100	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	87	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	95	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	93	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	87	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	88	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	90	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	98	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	93	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	96	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	95	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	80	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	51	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	91	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	94	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	90	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	81	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	89	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference.

Signed: [redacted]

Organics Manager, NMI-North Ryde

Date: **23/03/2022**

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2201342**	Page	: 1 of 19
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted] DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 18-Jan-2022 07:30
Order number	: 60612562_4.1	Date Analysis Commenced	: 19-Jan-2022
C-O-C number	: 32344	Issue Date	: 24-Jan-2022 16:44
Sampler	: [redacted]		
Site	: 1302_RAAF_Darwin		
Quote number	: SY/139/19 v4 60612562_4.1		
No. of samples received	: 32		
No. of samples analysed	: 32		

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*
[redacted]	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 Contact 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.
- EP231X: PFAS results for sample #4 confirmed by re-extraction and re-analysis.
- Amendment (24/01/2022): This report has been amended as a result of a request to change Project ID. All analysis results are as per the previous report.
- 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**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW170_220113	1302_QC100_220113	1302_SW162_220113	1302_QC300_220113	1302_QC400_220113
				Sampling date / time	13-Jan-2022 14:14	13-Jan-2022 14:16	13-Jan-2022 15:11	13-Jan-2022 15:14	13-Jan-2022 15:15
					ES2201342-001	ES2201342-002	ES2201342-004	ES2201342-005	ES2201342-006
					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		**0.15**	**0.14**	<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		**0.42**	**0.37**	**0.02**	<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: SURFACE WATER (Matrix: WATER)				Sample ID	1302_SW170_220113	1302_QC100_220113	1302_SW162_220113	1302_QC300_220113	1302_QC400_220113
				Sampling date / time	13-Jan-2022 14:14	13-Jan-2022 14:16	13-Jan-2022 15:11	13-Jan-2022 15:14	13-Jan-2022 15:15
Compound	CAS Number	LOR	Unit		ES2201342-001	ES2201342-002	ES2201342-004	ES2201342-005	ES2201342-006
					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		**0.59**	**0.51**	**0.02**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.57**	**0.51**	**0.02**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.59**	**0.51**	**0.02**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**105**	**105**	**108**	**106**
13C8-PFOA	----	0.02	%		**93.8**	**92.4**	**99.4**	**101**	**94.6**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW109_220113	1302_SW108_220113	1302_SW168_220113	1302_SW112_220114	1302_SW113_220114
				Sampling date / time	13-Jan-2022 16:51	13-Jan-2022 17:10	13-Jan-2022 17:23	14-Jan-2022 11:42	14-Jan-2022 11:54
					ES2201342-007	ES2201342-008	ES2201342-009	ES2201342-010	ES2201342-011
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.03**	**0.03**	**0.06**	**0.03**	**0.02**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.03**	**0.03**	**0.06**	**0.03**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.28**	**0.30**	**0.42**	**0.27**	**0.20**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.03**	**0.05**	**0.05**	**0.03**	**0.04**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.56**	**0.57**	**0.90**	**0.52**	**0.39**
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		**0.05**	**0.05**	**0.11**	**0.04**	**0.03**
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**	**0.03**	**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: SURFACE WATER (Matrix: WATER)				Sample ID	1302_SW109_220113	1302_SW108_220113	1302_SW168_220113	1302_SW112_220114	1302_SW113_220114
				Sampling date / time	13-Jan-2022 16:51	13-Jan-2022 17:10	13-Jan-2022 17:23	14-Jan-2022 11:42	14-Jan-2022 11:54
Compound	CAS Number	LOR	Unit		ES2201342-007	ES2201342-008	ES2201342-009	ES2201342-010	ES2201342-011
					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		**0.99**	**1.04**	**1.63**	**0.93**	**0.68**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.84**	**0.87**	**1.32**	**0.79**	**0.59**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.93**	**0.96**	**1.52**	**0.87**	**0.64**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**104**	**110**	**110**	**99.0**
13C8-PFOA	----	0.02	%		**97.2**	**96.2**	**94.0**	**96.9**	**91.4**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW115_220114	1302_SW106_220114	1302_QC101_220114	1302_QC301_220114	1302_QC401_220114
				Sampling date / time	14-Jan-2022 09:32	14-Jan-2022 09:56	14-Jan-2022 09:57	14-Jan-2022 10:03	14-Jan-2022 10:04
					ES2201342-012	ES2201342-013	ES2201342-014	ES2201342-015	ES2201342-016
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.03**	**0.03**	**0.03**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.03**	**0.03**	**0.03**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.26**	**0.27**	**0.27**	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.03**	**0.04**	**0.04**	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.43**	**0.54**	**0.59**	<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		**0.05**	**0.04**	**0.04**	<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: SURFACE WATER (Matrix: WATER)				Sample ID	1302_SW115_220114	1302_SW106_220114	1302_QC101_220114	1302_QC301_220114	1302_QC401_220114
				Sampling date / time	14-Jan-2022 09:32	14-Jan-2022 09:56	14-Jan-2022 09:57	14-Jan-2022 10:03	14-Jan-2022 10:04
Compound	CAS Number	LOR	Unit		ES2201342-012	ES2201342-013	ES2201342-014	ES2201342-015	ES2201342-016
					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		**0.83**	**0.95**	**1.00**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.69**	**0.81**	**0.86**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.77**	**0.88**	**0.93**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**108**	**105**	**110**	**102**	**104**
13C8-PFOA	----	0.02	%		**93.4**	**100**	**92.0**	**93.7**	**90.9**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW114_220114	1302_SW104_220114	1302_SW120_220114	1302_SW124_220114	1302_SW125_220114
				Sampling date / time	14-Jan-2022 11:01	14-Jan-2022 11:15	14-Jan-2022 12:16	14-Jan-2022 12:36	14-Jan-2022 12:58
					ES2201342-017	ES2201342-018	ES2201342-019	ES2201342-020	ES2201342-021
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.17**	**0.06**	**0.05**	<0.02	**0.15**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.16**	**0.05**	**0.05**	<0.02	**0.15**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.55**	**0.50**	**0.52**	**0.17**	**1.46**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.15**	**0.08**	**0.06**	**0.05**	**0.09**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**3.24**	**1.24**	**0.91**	**0.59**	**2.41**
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		**0.07**	<0.02	<0.02	<0.02	**0.05**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.39**	**0.12**	**0.09**	**0.02**	**0.26**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.04**	<0.02	<0.02	<0.02	**0.04**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.06**	**0.02**	**0.02**	<0.01	**0.06**
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: SURFACE WATER (Matrix: WATER)				Sample ID	1302_SW114_220114	1302_SW104_220114	1302_SW120_220114	1302_SW124_220114	1302_SW125_220114
				Sampling date / time	14-Jan-2022 11:01	14-Jan-2022 11:15	14-Jan-2022 12:16	14-Jan-2022 12:36	14-Jan-2022 12:58
Compound	CAS Number	LOR	Unit		ES2201342-017	ES2201342-018	ES2201342-019	ES2201342-020	ES2201342-021
					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		**5.83**	**2.07**	**1.70**	**0.83**	**4.67**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**4.79**	**1.74**	**1.43**	**0.76**	**3.87**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**5.52**	**1.94**	**1.59**	**0.78**	**4.43**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**107**	**101**	**105**	**108**	**113**
13C8-PFOA	----	0.02	%		**93.5**	**97.1**	**94.1**	**95.3**	**82.8**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	1302_SW132_220114	1302_SW133_220114	1302_SW143_22011	1302_SW178_220117	1302_SW181_220117
				Sampling date / time	14-Jan-2022 14:40	14-Jan-2022 15:10	14-Jan-2022 15:31	17-Jan-2022 14:10	17-Jan-2022 14:20
Compound	CAS Number	LOR	Unit		ES2201342-022	ES2201342-023	ES2201342-024	ES2201342-025	ES2201342-026
					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		**0.06**	**0.07**	**0.09**	**0.04**	**0.05**
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		**0.12**	**0.06**	**0.16**	**0.34**	**0.18**
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	**0.04**	**0.06**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.04**	**0.06**	<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: SURFACE WATER (Matrix: WATER)				Sample ID	1302_SW132_220114	1302_SW133_220114	1302_SW143_22011	1302_SW178_220117	1302_SW181_220117
				Sampling date / time	14-Jan-2022 14:40	14-Jan-2022 15:10	14-Jan-2022 15:31	17-Jan-2022 14:10	17-Jan-2022 14:20
Compound	CAS Number	LOR	Unit		ES2201342-022	ES2201342-023	ES2201342-024	ES2201342-025	ES2201342-026
					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	**0.12**	<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		**0.18**	**0.21**	**0.52**	**0.38**	**0.23**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.18**	**0.13**	**0.25**	**0.38**	**0.23**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.18**	**0.21**	**0.52**	**0.38**	**0.23**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**117**	**114**	**111**	**117**	**109**
13C8-PFOA	----	0.02	%		**83.4**	**81.6**	**84.7**	**82.8**	**81.7**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_QC302_220117	1302_QC402_220117	1302_SW160_220117	1302_SW156_220117	1302_SW152_220117
				Sampling date / time	17-Jan-2022 14:26	17-Jan-2022 14:27	17-Jan-2022 14:45	17-Jan-2022 15:03	17-Jan-2022 15:46
					ES2201342-027	ES2201342-028	ES2201342-029	ES2201342-030	ES2201342-031
					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	**0.03**	**0.03**	**0.04**
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	**0.09**	**0.10**	**0.18**
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	**0.02**	<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: SURFACE WATER (Matrix: WATER)				Sample ID	1302_QC302_220117	1302_QC402_220117	1302_SW160_220117	1302_SW156_220117	1302_SW152_220117
				Sampling date / time	17-Jan-2022 14:26	17-Jan-2022 14:27	17-Jan-2022 14:45	17-Jan-2022 15:03	17-Jan-2022 15:46
Compound	CAS Number	LOR	Unit		ES2201342-027	ES2201342-028	ES2201342-029	ES2201342-030	ES2201342-031
					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	**0.14**	**0.17**	**0.22**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	**0.12**	**0.13**	**0.22**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	**0.14**	**0.17**	**0.22**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**118**	**116**	**118**	**118**	**114**
13C8-PFOA	----	0.02	%		**85.4**	**81.4**	**81.5**	**81.7**	**83.9**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	1302_QC102_220117	----	----	----	----
				Sampling date / time	17-Jan-2022 15:47	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2201342-032	--------	--------	--------	--------
					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		**0.04**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.19**	----	----	----	----
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: SURFACE WATER (Matrix: WATER)				Sample ID	1302_QC102_220117	----	----	----	----
				Sampling date / time	17-Jan-2022 15:47	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2201342-032	--------	--------	--------	--------
					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		**0.23**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.23**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.23**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**120**	----	----	----	----
13C8-PFOA	----	0.02	%		**85.1**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC500	----	----	----	----
				Sampling date / time	17-Jan-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2201342-034	--------	--------	--------	--------
					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: WATER (Matrix: WATER)				Sample ID	QC500	----	----	----	----
				Sampling date / time	17-Jan-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2201342-034	--------	--------	--------	--------
					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	%		**116**	----	----	----	----
13C8-PFOA	----	0.02	%		**82.2**	----	----	----	----

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

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2201342**	Page	: 1 of 5
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted] DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 18-Jan-2022
Order number	: 60612562_4.1	Date Analysis Commenced	: 19-Jan-2022
C-O-C number	: 32344	Issue Date	: 24-Jan-2022
Sampler	: [redacted]		
Site	: 1302_RAAF_Darwin		
Quote number	: SY/139/19 v4 60612562_4.1		
No. of samples received	: 32		
No. of samples analysed	: 32		

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*
[redacted]	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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4129159)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	95.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	88.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	93.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	92.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	88.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	99.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4129170)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	90.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	90.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	88.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	87.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	88.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4129159)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	79.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	82.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	88.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	78.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	98.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	92.2	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	99.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	95.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	97.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4129170)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	94.5	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	115	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	92.0	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	79.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.2	69.0	133

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: 4129170) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	92.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	111	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4129159)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	85.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	95.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	91.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	93.4	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	106	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	77.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	91.0	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4129170)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	82.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	88.2	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	80.7	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	94.7	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	86.3	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	92.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	92.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4129159)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	86.0	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	83.2	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	101	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	95.0	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4129170)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	95.6	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	91.0	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	98.2	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	85.0	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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2201342**	Page	: 1 of 6
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 18-Jan-2022
Site	: 1302_RAAF_Darwin	Issue Date	: 24-Jan-2022
Sampler	: [redacted]	No. of samples received	: 32
Order number	: 60612562_4.1	No. of samples analysed	: 32

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

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

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	0	36	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	36	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: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW170_220113, 1302_QC100_220113, 1302_SW162_220113, 1302_SW300_220113, 1302_QC400_220113, 1302_SW109_220113, 1302_SW108_220113, 1302_SW168_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW112_220114, 1302_SW113_220114, 1302_SW115_220114, 1302_SW106_220114, 1302_QC101_220114, 1302_QC301_220114, 1302_QC401_220114, 1302_SW114_220114, 1302_SW104_220114, 1302_SW120_220114, 1302_SW124_220114, 1302_SW125_220114, 1302_SW132_220114, 1302_SW133_220114, 1302_SW143_22011	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**21-Jan-2022**	13-Jul-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW178_220117, 1302_SW181_220117, 1302_QC302_220117, 1302_QC402_220117, 1302_SW160_220117, 1302_SW156_220117, 1302_SW152_220117, 1302_QC102_220117, QC500	**17-Jan-2022**	**20-Jan-2022**	16-Jul-2022	✓	**21-Jan-2022**	16-Jul-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
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW170_220113, 1302_QC100_220113, 1302_SW162_220113, 1302_QC300_220113, 1302_QC400_220113, 1302_SW109_220113, 1302_SW108_220113, 1302_SW168_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW112_220114, 1302_SW113_220114, 1302_SW115_220114, 1302_SW106_220114, 1302_QC101_220114, 1302_QC301_220114, 1302_QC401_220114, 1302_SW114_220114, 1302_SW104_220114, 1302_SW120_220114, 1302_SW124_220114, 1302_SW125_220114, 1302_SW132_220114, 1302_SW133_220114, 1302_SW143_22011	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**21-Jan-2022**	13-Jul-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW178_220117, 1302_SW181_220117, 1302_QC302_220117, 1302_QC402_220117, 1302_SW160_220117, 1302_SW156_220117, 1302_SW152_220117, 1302_QC102_220117, QC500	**17-Jan-2022**	**20-Jan-2022**	16-Jul-2022	✓	**21-Jan-2022**	16-Jul-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
1302_SW170_220113, 1302_QC100_220113, 1302_SW162_220113, 1302_QC300_220113, 1302_QC400_220113, 1302_SW109_220113, 1302_SW108_220113, 1302_SW168_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW112_220114, 1302_SW113_220114, 1302_SW115_220114, 1302_SW106_220114, 1302_QC101_220114, 1302_QC301_220114, 1302_QC401_220114, 1302_SW114_220114, 1302_SW104_220114, 1302_SW120_220114, 1302_SW124_220114, 1302_SW125_220114, 1302_SW132_220114, 1302_SW133_220114, 1302_SW143_22011	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**21-Jan-2022**	13-Jul-2022	✓
HDPE (no PTFE) (EP231X)							
1302_SW178_220117, 1302_SW181_220117, 1302_QC302_220117, 1302_QC402_220117, 1302_SW160_220117, 1302_SW156_220117, 1302_SW152_220117, 1302_QC102_220117, QC500	**17-Jan-2022**	**20-Jan-2022**	16-Jul-2022	✓	**21-Jan-2022**	16-Jul-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
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1302_SW170_220113, 1302_QC100_220113, 1302_SW162_220113, 1302_QC300_220113, 1302_QC400_220113, 1302_SW109_220113, 1302_SW108_220113, 1302_SW168_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
HDPE (no PTFE) (EP231X) 1302_SW112_220114, 1302_SW113_220114, 1302_SW115_220114, 1302_SW106_220114, 1302_QC101_220114, 1302_QC301_220114, 1302_QC401_220114, 1302_SW114_220114, 1302_SW104_220114, 1302_SW120_220114, 1302_SW124_220114, 1302_SW125_220114, 1302_SW132_220114, 1302_SW133_220114, 1302_SW143_22011	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**21-Jan-2022**	13-Jul-2022	✓
HDPE (no PTFE) (EP231X) 1302_SW178_220117, 1302_SW181_220117, 1302_QC302_220117, 1302_QC402_220117, 1302_SW160_220117, 1302_SW156_220117, 1302_SW152_220117, 1302_QC102_220117, QC500	**17-Jan-2022**	**20-Jan-2022**	16-Jul-2022	✓	**21-Jan-2022**	16-Jul-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 1302_SW170_220113, 1302_QC100_220113, 1302_SW162_220113, 1302_QC300_220113, 1302_QC400_220113, 1302_SW109_220113, 1302_SW108_220113, 1302_SW168_220113	**13-Jan-2022**	**20-Jan-2022**	12-Jul-2022	✓	**21-Jan-2022**	12-Jul-2022	✓
HDPE (no PTFE) (EP231X) 1302_SW112_220114, 1302_SW113_220114, 1302_SW115_220114, 1302_SW106_220114, 1302_QC101_220114, 1302_QC301_220114, 1302_QC401_220114, 1302_SW114_220114, 1302_SW104_220114, 1302_SW120_220114, 1302_SW124_220114, 1302_SW125_220114, 1302_SW132_220114, 1302_SW133_220114, 1302_SW143_22011	**14-Jan-2022**	**20-Jan-2022**	13-Jul-2022	✓	**21-Jan-2022**	13-Jul-2022	✓
HDPE (no PTFE) (EP231X) 1302_SW178_220117, 1302_SW181_220117, 1302_QC302_220117, 1302_QC402_220117, 1302_SW160_220117, 1302_SW156_220117, 1302_SW152_220117, 1302_QC102_220117, QC500	**17-Jan-2022**	**20-Jan-2022**	16-Jul-2022	✓	**21-Jan-2022**	16-Jul-2022	✓

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	36	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	36	**0.00**	**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
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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2203382**	Page	: 1 of 33
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted] DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 02-Feb-2022 07:11
Order number	: 60612531	Date Analysis Commenced	: 07-Feb-2022
C-O-C number	: ----	Issue Date	: 17-Feb-2022 13:28
Sampler	: [redacted]		
Site	: ----		
Quote number	: SY/139/19 V3		
No. of samples received	: 71		
No. of samples analysed	: 71		

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*
[redacted]	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 Contact 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.
- EP231X (Biota): ALS NATA accreditation for PFAS in Biota covers all Perfluoroalkyl Sulfonic Acids, Perfluoroalkyl Carboxylic Acids and (n:2) Fluorotelomer Sulfonic Acids in fish (whole and muscle), plants and vegetable matrices, with the exception PFBA (fish only), EtFOSA, MeFOSE, EtFOSE, MeFOSAA, EtFOSAA.
- 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: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA204_211108	1302_BIOAFA205_211108	1302_BIOAFA206_211108	1302_BIOAFA207_211108	1302_BIOAFA208_211108
			Sampling date / time	08-Nov-2021 00:00	08-Nov-2021 00:00	08-Nov-2021 00:00	08-Nov-2021 00:00	08-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	ES2203382-001	ES2203382-002	ES2203382-003	ES2203382-004	ES2203382-005
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	Mussels (internal organs	Mussels (internal organs	Mussels (internal organs	Mussels (internal organs	Mussels (internal organs
ø Weight of Sample Prepared	----	0.1	g	45.7	44.7	57.8	53.4	48.0
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	6	7	7	10	6
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	1	1	1	2	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	7	8	8	12	7
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	4	3	3	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA204_211108	1302_BIOAFA205_211108	1302_BIOAFA206_211108	1302_BIOAFA207_211108	1302_BIOAFA208_211108
				Sampling date / time	08-Nov-2021 00:00	08-Nov-2021 00:00	08-Nov-2021 00:00	08-Nov-2021 00:00	08-Nov-2021 00:00
Compound	CAS Number	LOR	Unit		ES2203382-001	ES2203382-002	ES2203382-003	ES2203382-004	ES2203382-005
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**11**	**11**	**11**	**12**	**7**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**93.5**	**89.5**	**107**	**110**	**87.0**
13C8-PFOA	----	1	%		**95.0**	**89.0**	**96.5**	**93.5**	**83.5**

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA209_211 113	1302_BIOAFA210_211 113	1302_BIOAFA211_211 113	1302_BIOAFA212_211 114	1302_BIOAFA213_211 114
				Sampling date / time	13-Nov-2021 00:00	13-Nov-2021 00:00	13-Nov-2021 00:00	14-Nov-2021 00:00	14-Nov-2021 00:00
					ES2203382-006	ES2203382-007	ES2203382-008	ES2203382-009	ES2203382-010
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø Sample Description	----	-	--		Yabbies	Yabbies	Yabbies	Yabbies	Yabbies
ø Weight of Sample Prepared	----	0.1	g		49.1	76.5	70.0	33.2	33.0
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		2	<1	2	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		2	1	2	2	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		16	18	21	13	10
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		18	37	37	17	18
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		4	10	10	4	4
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		22	47	47	21	22
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		2	<1	2	<1	1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	4	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	3	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA** (Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA209_211113	1302_BIOAFA210_211113	1302_BIOAFA211_211113	1302_BIOAFA212_211114	1302_BIOAFA213_211114
				Sampling date / time	13-Nov-2021 00:00	13-Nov-2021 00:00	13-Nov-2021 00:00	14-Nov-2021 00:00	14-Nov-2021 00:00
					ES2203382-006	ES2203382-007	ES2203382-008	ES2203382-009	ES2203382-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**44**	**75**	**74**	**37**	**34**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**99.0**	**103**	**120**	**116**	**96.5**
13C8-PFOA	----	1	%		**89.0**	**86.0**	**101**	**84.5**	**92.0**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA214_211 114	1302_BIOAFA215_211 112	1302_BIOAFA216_211 112	1302_BIOAFA217_211 112	1302_BIOAFA218_211 125
			Sampling date / time	14-Nov-2021 00:00	12-Nov-2021 00:00	12-Nov-2021 00:00	12-Nov-2021 00:00	25-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	ES2203382-011	ES2203382-012	ES2203382-013	ES2203382-014	ES2203382-015
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	Yabbies	Yabbies	Yabbies	Yabbies	Fillet
ø Weight of Sample Prepared	----	0.1	g	49.3	11.7	23.6	29.8	100
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	8	15	8	5	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	18	37	24	9	1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	4	6	6	2	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	22	43	30	11	1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA214_211114	1302_BIOAFA215_211112	1302_BIOAFA216_211112	1302_BIOAFA217_211112	1302_BIOAFA218_211125
				Sampling date / time	14-Nov-2021 00:00	12-Nov-2021 00:00	12-Nov-2021 00:00	12-Nov-2021 00:00	25-Nov-2021 00:00
					ES2203382-011	ES2203382-012	ES2203382-013	ES2203382-014	ES2203382-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**31**	**60**	**40**	**16**	**1**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**97.5**	**94.0**	**81.0**	**97.5**	**91.0**
13C8-PFOA	----	1	%		**95.0**	**86.5**	**75.5**	**86.5**	**90.0**

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA219_211125	1302_BIOAFA220_211125	1302_BIOAFA221_211125	1302_BIOAFA222_211125	1302_BIOAFA223_211125
				Sampling date / time	25-Nov-2021 00:00	25-Nov-2021 00:00	25-Nov-2021 00:00	25-Nov-2021 00:00	25-Nov-2021 00:00
					ES2203382-016	ES2203382-017	ES2203382-018	ES2203382-019	ES2203382-020
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø Sample Description	----	-	--		**Fillet**	**Fillet**	**Fillet**	**Fillet**	**Fillet**
ø Weight of Sample Prepared	----	0.1	g		**88.9**	**66.2**	**37.7**	**45.6**	**40.0**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	<1	**1**	**1**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		**1**	<1	<1	<1	**1**
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		**1**	<1	<1	**1**	**1**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		**2**	<1	<1	**1**	**2**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA219_211125	1302_BIOAFA220_211125	1302_BIOAFA221_211125	1302_BIOAFA222_211125	1302_BIOAFA223_211125
				Sampling date / time	25-Nov-2021 00:00	25-Nov-2021 00:00	25-Nov-2021 00:00	25-Nov-2021 00:00	25-Nov-2021 00:00
Compound	CAS Number	LOR	Unit		ES2203382-016	ES2203382-017	ES2203382-018	ES2203382-019	ES2203382-020
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**2**	<1	<1	**2**	**3**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**104**	**84.5**	**71.0**	**111**	**119**
13C8-PFOA	----	1	%		**90.5**	**91.0**	**91.0**	**95.5**	**105**

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA224_211125	1302_BIOAFA225_211125	1302_BIOAFA226_211125	1302_BIOAFA227_211125	1302_BIOAFA228_211125
				Sampling date / time	25-Nov-2021 00:00	25-Nov-2021 00:00	25-Nov-2021 00:00	25-Nov-2021 00:00	25-Nov-2021 00:00
					ES2203382-021	ES2203382-022	ES2203382-023	ES2203382-024	ES2203382-025
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø Sample Description	----	-	--		Fillet	Fillet	Fillet	Fillet	Fillet
ø Weight of Sample Prepared	----	0.1	g		32.5	52.0	57.7	70.4	50.0
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		2	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		2	<1	4	7	6
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		<1	<1	1	2	2
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		2	<1	5	9	8
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA224_211125	1302_BIOAFA225_211125	1302_BIOAFA226_211125	1302_BIOAFA227_211125	1302_BIOAFA228_211125
			Sampling date / time	25-Nov-2021 00:00	25-Nov-2021 00:00	25-Nov-2021 00:00	25-Nov-2021 00:00	25-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	ES2203382-021	ES2203382-022	ES2203382-023	ES2203382-024	ES2203382-025
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg	<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg	<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	<2	<2	<2
EP231P: PFAS Sums								
^ Sum of PFAS	----	1	µg/kg	**4**	<1	**5**	**9**	**8**
EP231S: PFAS Surrogate								
13C4-PFOS	----	1	%	**91.0**	**100**	**93.5**	**105**	**102**
13C8-PFOA	----	1	%	**98.0**	**99.0**	**92.0**	**99.5**	**92.5**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA229_211125	1302_BIOAFA230_211203	1302_BIOAFA231_211203	1302_BIOAFA232_211203	1302_BIOAFA233_211203
				Sampling date / time	25-Nov-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		ES2203382-026	ES2203382-027	ES2203382-028	ES2203382-029	ES2203382-030
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø Sample Description	----	-	--		Fillet	Fillet	Fillet	Fish (small)	Fish (small)
ø Weight of Sample Prepared	----	0.1	g		62.9	45.4	38.3	23.3	11.7
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		4	2	3	2	2
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		<1	<1	1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		4	2	4	2	2
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA** (Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA229_211125	1302_BIOAFA230_211203	1302_BIOAFA231_211203	1302_BIOAFA232_211203	1302_BIOAFA233_211203
				Sampling date / time	25-Nov-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00
					ES2203382-026	ES2203382-027	ES2203382-028	ES2203382-029	ES2203382-030
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**4**	**2**	**4**	**2**	**2**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**97.0**	**108**	**95.5**	**103**	**97.0**
13C8-PFOA	----	1	%		**88.5**	**95.0**	**95.0**	**93.5**	**93.5**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA234_211203	1302_BIOAFA235_211203	1302_BIOAFA236_211203	1302_BIOAFA237_211124	1302_BIOAFA238_211124
			Sampling date / time	03-Dec-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	ES2203382-031	ES2203382-032	ES2203382-033	ES2203382-034	ES2203382-035
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	Fish (small)	Fish (small)	Fish (small)	Fillet	Fillet
ø Weight of Sample Prepared	----	0.1	g	17.8	16.3	30.4	141	104
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	<1	<1	<1	1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	<1	<1	1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	<1	<1	2	<1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA234_211203	1302_BIOAFA235_211203	1302_BIOAFA236_211203	1302_BIOAFA237_211124	1302_BIOAFA238_211124
				Sampling date / time	03-Dec-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00
Compound	CAS Number	LOR	Unit		ES2203382-031	ES2203382-032	ES2203382-033	ES2203382-034	ES2203382-035
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	<1	<1	**2**	<1
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**99.0**	**103**	**105**	**101**	**91.5**
13C8-PFOA	----	1	%		**96.5**	**92.5**	**104**	**94.5**	**83.0**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA239_211124	1302_BIOAFA240_211124	1302_BIOAFA241_211124	1302_BIOAFA242_211124	1302_BIOAFA243_211124
			Sampling date / time	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	ES2203382-036	ES2203382-037	ES2203382-038	ES2203382-039	ES2203382-040
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	Fillet	Fillet	Fillet	Fillet	Fillet
ø Weight of Sample Prepared	----	0.1	g	62.4	80.4	18.1	96.5	79.6
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	3	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	<1	6	<1	1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	1	<1	1	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	7	<1	2	1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA239_211124	1302_BIOAFA240_211124	1302_BIOAFA241_211124	1302_BIOAFA242_211124	1302_BIOAFA243_211124
				Sampling date / time	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00
Compound	CAS Number	LOR	Unit		ES2203382-036	ES2203382-037	ES2203382-038	ES2203382-039	ES2203382-040
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	**10**	<1	**2**	**1**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**94.0**	**94.5**	**98.5**	**99.0**	**112**
13C8-PFOA	----	1	%		**94.5**	**87.5**	**98.5**	**88.0**	**102**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA244_211124	1302_BIOAFA245_211124	1302_BIOAFA246_211124	1302_BIOAFA247_211124	1302_BIOAFA248_211124
			Sampling date / time	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	ES2203382-041	ES2203382-042	ES2203382-043	ES2203382-044	ES2203382-045
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	fillet	fillet	fillet	fillet	fillet
ø Weight of Sample Prepared	----	0.1	g	98.8	85.0	96.8	47.0	64.7
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	9	5
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	2	<1	<1	33	3
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	<1	<1	6	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	2	<1	<1	39	4
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA244_211124	1302_BIOAFA245_211124	1302_BIOAFA246_211124	1302_BIOAFA247_211124	1302_BIOAFA248_211124
				Sampling date / time	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00
					ES2203382-041	ES2203382-042	ES2203382-043	ES2203382-044	ES2203382-045
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**2**	<1	<1	**48**	**9**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**108**	**106**	**99.0**	**90.0**	**104**
13C8-PFOA	----	1	%		**116**	**114**	**106**	**116**	**106**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA249_211124	1302_BIOAFA250_211124	1302_BIOAFA251_211124	1302_BIOAFA252_211124	1302_BIOAFA253_211124
			Sampling date / time	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	ES2203382-046	ES2203382-047	ES2203382-048	ES2203382-049	ES2203382-050
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	fillet	fillet	fillet	fillet	fillet with bone and skin
ø Weight of Sample Prepared	----	0.1	g	68.0	46.7	29.9	51.9	119
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	30	1	1	2	9
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	31	1	1	2	9
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA249_211124	1302_BIOAFA250_211124	1302_BIOAFA251_211124	1302_BIOAFA252_211124	1302_BIOAFA253_211124
				Sampling date / time	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00
Compound	CAS Number	LOR	Unit		ES2203382-046	ES2203382-047	ES2203382-048	ES2203382-049	ES2203382-050
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**31**	**1**	**1**	**2**	**9**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**101**	**96.5**	**104**	**116**	**99.5**
13C8-PFOA	----	1	%		**106**	**105**	**110**	**108**	**106**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA254_211124	1302_BIOAFA255_211124	1302_BIOAFA256_211124	1302_BIOAFA257_211124	1302_QC131_211125
			Sampling date / time	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	25-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	ES2203382-051	ES2203382-052	ES2203382-053	ES2203382-054	ES2203382-056
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	fillet	fillet with bone and skin	fillet	fillet	fillet
ø Weight of Sample Prepared	----	0.1	g	51.6	41.4	81.6	68.0	99.9
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	2	1	<1	1	2
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	2	1	<1	1	2
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA254_211124	1302_BIOAFA255_211124	1302_BIOAFA256_211124	1302_BIOAFA257_211124	1302_QC131_211125
				Sampling date / time	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00	25-Nov-2021 00:00
Compound	CAS Number	LOR	Unit		ES2203382-051	ES2203382-052	ES2203382-053	ES2203382-054	ES2203382-056
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**2**	**1**	<1	**1**	**2**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**112**	**90.0**	**106**	**120**	**100**
13C8-PFOA	----	1	%		**104**	**101**	**108**	**117**	**108**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_QC132_211125	1302_QC133_211125	1302_QC134_211125	1302_QC135_211124	1302_QC136_211124
			Sampling date / time	25-Nov-2021 00:00	25-Nov-2021 00:00	25-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00
Compound	CAS Number	LOR	Unit	ES2203382-057	ES2203382-058	ES2203382-059	ES2203382-060	ES2203382-061
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	fillet	fillet	fillet	fillet	fillet
ø Weight of Sample Prepared	----	0.1	g	84.4	47.5	43.8	113	98.1
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	1	<1	1	2	1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	1	<1	1	2	1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_QC132_211125	1302_QC133_211125	1302_QC134_211125	1302_QC135_211124	1302_QC136_211124
				Sampling date / time	25-Nov-2021 00:00	25-Nov-2021 00:00	25-Nov-2021 00:00	24-Nov-2021 00:00	24-Nov-2021 00:00
Compound	CAS Number	LOR	Unit		ES2203382-057	ES2203382-058	ES2203382-059	ES2203382-060	ES2203382-061
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**1**	<1	**1**	**2**	**1**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**102**	**108**	**107**	**106**	**90.0**
13C8-PFOA	----	1	%		**112**	**102**	**106**	**108**	**116**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_QC137_211124	1302_QC138_211124	----	----	----
			Sampling date / time	24-Nov-2021 00:00	24-Nov-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2203382-062	ES2203382-063	--------	--------	--------
				Result	Result	----	----	----
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	fillet	fillet	----	----	----
ø Weight of Sample Prepared	----	0.1	g	66.3	87.3	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	3	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	----	----	----
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	<1	4	----	----	----
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	1	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	5	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	----	----	----

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_QC137_211124	1302_QC138_211124	----	----	----
				Sampling date / time	24-Nov-2021 00:00	24-Nov-2021 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2203382-062	ES2203382-063	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	----	----	----
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	**8**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**108**	**112**	----	----	----
13C8-PFOA	----	1	%		**102**	**108**	----	----	----

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_QC130_211203	1302_QC303_220127	1302_QC503_211115	1302_SW013_211203	1302_SW014_211203
				Sampling date / time	03-Dec-2021 00:00	27-Jan-2022 00:00	15-Nov-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00
					ES2203382-055	ES2203382-064	ES2203382-065	ES2203382-066	ES2203382-067
					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		**0.02**	<0.01	<0.01	**0.03**	**0.03**
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		**0.04**	<0.01	<0.01	**0.04**	**0.02**
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: WATER (Matrix: WATER)				Sample ID	1302_QC130_211203	1302_QC303_220127	1302_QC503_211115	1302_SW013_211203	1302_SW014_211203
				Sampling date / time	03-Dec-2021 00:00	27-Jan-2022 00:00	15-Nov-2021 00:00	03-Dec-2021 00:00	03-Dec-2021 00:00
Compound	CAS Number	LOR	Unit		ES2203382-055	ES2203382-064	ES2203382-065	ES2203382-066	ES2203382-067
					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		**0.06**	<0.01	<0.01	**0.07**	**0.05**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.06**	<0.01	<0.01	**0.07**	**0.05**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.06**	<0.01	<0.01	**0.07**	**0.05**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.4**	**93.9**	**93.3**	**102**	**102**
13C8-PFOA	----	0.02	%		**103**	**99.6**	**106**	**107**	**106**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW015_211109	1302_SW016_211112	1302_SW017_211112	1302_SW018_211112	----
				Sampling date / time	09-Nov-2021 00:00	12-Nov-2021 00:00	12-Nov-2021 00:00	12-Nov-2021 00:00	----
Compound	CAS Number	LOR	Unit		ES2203382-068	ES2203382-069	ES2203382-070	ES2203382-071	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.04**	**0.07**	**0.04**	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.03**	**0.06**	**0.04**	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.40**	**0.52**	**0.30**	**0.11**	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.02**	**0.03**	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.49**	**0.67**	**0.37**	**0.14**	----
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		**0.08**	**0.13**	**0.06**	**0.03**	----
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		**0.02**	**0.03**	**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	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW015_211109	1302_SW016_211112	1302_SW017_211112	1302_SW018_211112	----
				Sampling date / time	09-Nov-2021 00:00	12-Nov-2021 00:00	12-Nov-2021 00:00	12-Nov-2021 00:00	----
Compound	CAS Number	LOR	Unit		ES2203382-068	ES2203382-069	ES2203382-070	ES2203382-071	--------
					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	----
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	----
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		**1.08**	**1.53**	**0.82**	**0.28**	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.89**	**1.19**	**0.67**	**0.25**	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.03**	**1.44**	**0.78**	**0.28**	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.4**	**93.0**	**97.2**	**103**	----
13C8-PFOA	----	0.02	%		**106**	**104**	**110**	**104**	----

Surrogate Control Limits

Sub-Matrix: **BIOTA**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	50	130
13C8-PFOA	----	50	130

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2203382**	Page	: 1 of 19
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted] DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 02-Feb-2022
Order number	: 60612531	Date Analysis Commenced	: 07-Feb-2022
C-O-C number	: ----	Issue Date	: 17-Feb-2022
Sampler	: [redacted]		
Site	: ----		
Quote number	: SY/139/19 V3		
No. of samples received	: 71		
No. of samples analysed	: 71		

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*
[redacted]	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: **BIOTA**

				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: 4159825)									
ES2203382-001	1302_BIOAFA204_211108	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	7	10	34.6	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
ES2203382-011	1302_BIOAFA214_211114	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	8	7	15.3	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	22	19	17.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4159826)									
ES2203382-021	1302_BIOAFA224_211125	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	2	2	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	2	3	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
ES2203382-031	1302_BIOAFA234_211203	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	<1	0.0	No Limit

Sub-Matrix: **BIOTA**

				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: 4159826) - continued									
ES2203382-031	1302_BIOAFA234_211203	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4159827)									
ES2203382-041	1302_BIOAFA244_211124	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	2	2	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
ES2203382-051	1302_BIOAFA254_211124	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	2	2	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4159828)									
ES2203382-059	1302_QC134_211125	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	1	2	61.7	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4159825)									
ES2203382-001	1302_BIOAFA204_211108	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	4	4	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
ES2203382-011	1302_BIOAFA214_211114	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit

Sub-Matrix: **BIOTA**

				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: 4159825) - continued									
ES2203382-011	1302_BIOAFA214_211114	EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4159826)									
ES2203382-021	1302_BIOAFA224_211125	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
ES2203382-031	1302_BIOAFA234_211203	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4159827)									
ES2203382-041	1302_BIOAFA244_211124	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
ES2203382-051	1302_BIOAFA254_211124	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit

Sub-Matrix: **BIOTA**

				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: 4159827) - continued									
ES2203382-051	1302_BIOAFA254_211124	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4159828)									
ES2203382-059	1302_QC134_211125	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4159825)									
ES2203382-001	1302_BIOAFA204_211108	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
ES2203382-011	1302_BIOAFA214_211114	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit

Sub-Matrix: **BIOTA**

				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: 4159825) - continued									
ES2203382-011	1302_BIOAFA214_211114	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4159826)									
ES2203382-021	1302_BIOAFA224_211125	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
ES2203382-031	1302_BIOAFA234_211203	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4159827)									
ES2203382-041	1302_BIOAFA244_211124	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit

Sub-Matrix: **BIOTA**

				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: 4159827) - continued									
ES2203382-041	1302_BIOAFA244_211124	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
ES2203382-051	1302_BIOAFA254_211124	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4159828)									
ES2203382-059	1302_QC134_211125	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4159825)									
ES2203382-001	1302_BIOAFA204_211108	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit

Sub-Matrix: **BIOTA**

				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: 4159825) - continued									
ES2203382-001	1302_BIOAFA204_211108	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit
ES2203382-011	1302_BIOAFA214_211114	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4159826)									
ES2203382-021	1302_BIOAFA224_211125	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit
ES2203382-031	1302_BIOAFA234_211203	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4159827)									
ES2203382-041	1302_BIOAFA244_211124	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit

Sub-Matrix: **BIOTA**

				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: 4159827) - continued									
ES2203382-051	1302_BIOAFA254_211124	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4159828)									
ES2203382-059	1302_QC134_211125	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4159825)									
ES2203382-001	1302_BIOAFA204_211108	EP231X: Sum of PFAS	----	1	µg/kg	11	14	24.0	0% - 50%
ES2203382-011	1302_BIOAFA214_211114	EP231X: Sum of PFAS	----	1	µg/kg	31	26	17.5	0% - 20%
EP231P: PFAS Sums (QC Lot: 4159826)									
ES2203382-021	1302_BIOAFA224_211125	EP231X: Sum of PFAS	----	1	µg/kg	4	5	22.2	No Limit
ES2203382-031	1302_BIOAFA234_211203	EP231X: Sum of PFAS	----	1	µg/kg	<1	<1	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4159827)									
ES2203382-041	1302_BIOAFA244_211124	EP231X: Sum of PFAS	----	1	µg/kg	2	2	0.0	No Limit
ES2203382-051	1302_BIOAFA254_211124	EP231X: Sum of PFAS	----	1	µg/kg	2	2	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4159828)									
ES2203382-059	1302_QC134_211125	EP231X: Sum of PFAS	----	1	µg/kg	1	2	66.7	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: **BIOTA**

				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: 4159825)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	5 µg/kg	94.8	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	5 µg/kg	79.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	5 µg/kg	80.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	5 µg/kg	84.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	5 µg/kg	85.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<1	5 µg/kg	110	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4159826)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	5 µg/kg	101	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	5 µg/kg	76.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	5 µg/kg	84.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	5 µg/kg	84.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	5 µg/kg	82.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<1	5 µg/kg	95.6	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4159827)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	5 µg/kg	99.6	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	5 µg/kg	89.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	5 µg/kg	89.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	5 µg/kg	95.6	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	5 µg/kg	94.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<1	5 µg/kg	84.0	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4159828)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	5 µg/kg	99.2	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	5 µg/kg	87.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	5 µg/kg	90.4	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	5 µg/kg	95.6	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	5 µg/kg	96.8	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<1	5 µg/kg	103	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4159825)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	25 µg/kg	110	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<1	5 µg/kg	98.8	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	5 µg/kg	105	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	5 µg/kg	88.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	5 µg/kg	87.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	5 µg/kg	90.4	72.0	129

Sub-Matrix: **BIOTA**

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: 4159825) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	5 µg/kg	82.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	5 µg/kg	94.4	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<1	5 µg/kg	103	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<1	5 µg/kg	81.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	12.5 µg/kg	91.7	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4159826)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	25 µg/kg	115	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<1	5 µg/kg	123	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	5 µg/kg	107	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	5 µg/kg	92.0	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	5 µg/kg	88.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	5 µg/kg	90.4	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	5 µg/kg	93.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	5 µg/kg	88.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<1	5 µg/kg	98.4	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<1	5 µg/kg	86.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	12.5 µg/kg	91.8	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4159827)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	25 µg/kg	103	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<1	5 µg/kg	106	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	5 µg/kg	123	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	5 µg/kg	114	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	5 µg/kg	106	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	5 µg/kg	116	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	5 µg/kg	121	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	5 µg/kg	118	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<1	5 µg/kg	93.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<1	5 µg/kg	80.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	12.5 µg/kg	108	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4159828)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	25 µg/kg	107	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<1	5 µg/kg	90.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	5 µg/kg	117	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	5 µg/kg	105	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	5 µg/kg	104	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	5 µg/kg	112	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	5 µg/kg	123	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	5 µg/kg	122	64.0	136

Sub-Matrix: **BIOTA**

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: 4159828) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<1	5 µg/kg	112	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<1	5 µg/kg	83.2	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	12.5 µg/kg	113	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4159825)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<1	5 µg/kg	84.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<2	12.5 µg/kg	98.6	88.1	105
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	12.5 µg/kg	84.6	81.6	144
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	12.5 µg/kg	97.6	84.7	135
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	12.5 µg/kg	86.4	20.5	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	5 µg/kg	72.0	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	5 µg/kg	88.0	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4159826)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<1	5 µg/kg	80.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<2	12.5 µg/kg	101	88.1	105
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	12.5 µg/kg	83.5	81.6	144
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	12.5 µg/kg	112	84.7	135
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	12.5 µg/kg	85.8	20.5	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	5 µg/kg	75.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	5 µg/kg	80.0	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4159827)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<1	5 µg/kg	112	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<2	12.5 µg/kg	# 109	88.1	105
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	12.5 µg/kg	117	81.6	144
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	12.5 µg/kg	96.0	84.7	135
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	12.5 µg/kg	117	20.5	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	5 µg/kg	107	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	5 µg/kg	89.6	61.0	139

Sub-Matrix: **BIOTA**

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: 4159828)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<1	5 µg/kg	102	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<2	12.5 µg/kg	# 112	88.1	105
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	12.5 µg/kg	126	81.6	144
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	12.5 µg/kg	101	84.7	135
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	12.5 µg/kg	104	20.5	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	5 µg/kg	106	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	5 µg/kg	93.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4159825)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	5 µg/kg	93.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	5 µg/kg	80.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	5 µg/kg	98.0	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	5 µg/kg	106	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4159826)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	5 µg/kg	102	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	5 µg/kg	80.8	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	5 µg/kg	95.6	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	5 µg/kg	# 83.2	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4159827)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	5 µg/kg	100	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	5 µg/kg	103	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	5 µg/kg	106	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	5 µg/kg	103	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4159828)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	5 µg/kg	94.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	5 µg/kg	99.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	5 µg/kg	107	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	5 µg/kg	95.2	93.4	130
EP231P: PFAS Sums (QCLot: 4159825)								
EP231X: Sum of PFAS	----	1	µg/kg	<1	----	----	----	----
EP231P: PFAS Sums (QCLot: 4159826)								
EP231X: Sum of PFAS	----	1	µg/kg	<1	----	----	----	----
EP231P: PFAS Sums (QCLot: 4159827)								
EP231X: Sum of PFAS	----	1	µg/kg	<1	----	----	----	----
EP231P: PFAS Sums (QCLot: 4159828)								

Sub-Matrix: **BIOTA**

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: 4159828) - continued								
EP231X: Sum of PFAS	----	1	µg/kg	<1	----	----	----	----

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4168856)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	125	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	107	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	108	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	104	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4168856)								
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	117	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	123	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	115	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	114	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	111	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	116	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	129	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	117	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	125	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4168856)								
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	110	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	103	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	131	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	122	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	116	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4168856)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	134	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	127	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: 4168856) - continued								
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.25 µg/L	120	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	119	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: **BIOTA**

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: 4159825)							
ES2203382-002	1302_BIOAFA205_211108	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	5 µg/kg	105	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	5 µg/kg	86.4	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	5 µg/kg	82.8	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	5 µg/kg	112	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	5 µg/kg	77.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	5 µg/kg	122	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4159826)							
ES2203382-022	1302_BIOAFA225_211125	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	5 µg/kg	104	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	5 µg/kg	76.0	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	5 µg/kg	88.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	5 µg/kg	96.0	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	5 µg/kg	84.8	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	5 µg/kg	118	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4159827)							
ES2203382-042	1302_BIOAFA245_211124	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	5 µg/kg	98.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	5 µg/kg	93.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	5 µg/kg	94.8	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	5 µg/kg	94.0	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	5 µg/kg	108	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	5 µg/kg	84.4	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4159828)							
ES2203382-060	1302_QC135_211124	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	5 µg/kg	99.2	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	5 µg/kg	88.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	5 µg/kg	84.8	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	5 µg/kg	90.4	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	5 µg/kg	81.2	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	5 µg/kg	121	59.0	134

Sub-Matrix: **BIOTA**

				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: 4159825)							
ES2203382-002	1302_BIOAFA205_211108	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	25 µg/kg	107	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	5 µg/kg	97.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	5 µg/kg	107	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	5 µg/kg	96.0	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	5 µg/kg	109	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	5 µg/kg	94.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	5 µg/kg	89.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	5 µg/kg	94.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	5 µg/kg	103	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	5 µg/kg	93.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	12.5 µg/kg	100	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4159826)							
ES2203382-022	1302_BIOAFA225_211125	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	25 µg/kg	111	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	5 µg/kg	109	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	5 µg/kg	114	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	5 µg/kg	95.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	5 µg/kg	94.4	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	5 µg/kg	102	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	5 µg/kg	105	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	5 µg/kg	98.4	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	5 µg/kg	108	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	5 µg/kg	77.2	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	12.5 µg/kg	99.7	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4159827)							
ES2203382-042	1302_BIOAFA245_211124	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	25 µg/kg	104	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	5 µg/kg	110	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	5 µg/kg	114	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	5 µg/kg	106	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	5 µg/kg	109	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	5 µg/kg	114	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	5 µg/kg	119	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	5 µg/kg	119	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	5 µg/kg	94.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	5 µg/kg	82.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	12.5 µg/kg	106	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4159828)							
ES2203382-060	1302_QC135_211124	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	25 µg/kg	104	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	5 µg/kg	91.6	69.0	132

Sub-Matrix: **BIOTA**

				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: 4159828) - continued							
ES2203382-060	1302_QC135_211124	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	5 µg/kg	112	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	5 µg/kg	104	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	5 µg/kg	103	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	5 µg/kg	118	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	5 µg/kg	121	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	5 µg/kg	122	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	5 µg/kg	102	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	5 µg/kg	80.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	12.5 µg/kg	114	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4159825)							
ES2203382-002	1302_BIOAFA205_211108	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	5 µg/kg	78.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	12.5 µg/kg	98.7	88.1	105
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	12.5 µg/kg	85.9	81.6	144
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	12.5 µg/kg	104	84.7	135
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	12.5 µg/kg	109	20.5	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	5 µg/kg	75.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	5 µg/kg	86.8	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4159826)							
ES2203382-022	1302_BIOAFA225_211125	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	5 µg/kg	86.4	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	12.5 µg/kg	# 109	88.1	105
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	12.5 µg/kg	83.5	81.6	144
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	12.5 µg/kg	112	84.7	135
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	12.5 µg/kg	98.9	20.5	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	5 µg/kg	74.4	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	5 µg/kg	87.6	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4159827)							
ES2203382-042	1302_BIOAFA245_211124	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	5 µg/kg	110	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	12.5 µg/kg	# 119	88.1	105

Sub-Matrix: **BIOTA**

				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: 4159827) - continued							
ES2203382-042	1302_BIOAFA245_211124	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	12.5 µg/kg	112	81.6	144
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	12.5 µg/kg	93.6	84.7	135
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	12.5 µg/kg	114	20.5	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	5 µg/kg	104	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	5 µg/kg	91.6	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4159828)							
ES2203382-060	1302_QC135_211124	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	5 µg/kg	100	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	12.5 µg/kg	# 114	88.1	105
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	12.5 µg/kg	122	81.6	144
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	12.5 µg/kg	92.2	84.7	135
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	12.5 µg/kg	122	20.5	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	5 µg/kg	98.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	5 µg/kg	98.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4159825)							
ES2203382-002	1302_BIOAFA205_211108	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	5 µg/kg	94.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	5 µg/kg	80.8	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	5 µg/kg	91.2	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	5 µg/kg	104	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4159826)							
ES2203382-022	1302_BIOAFA225_211125	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	5 µg/kg	101	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	5 µg/kg	93.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	5 µg/kg	92.0	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	5 µg/kg	# 76.0	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4159827)							
ES2203382-042	1302_BIOAFA245_211124	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	5 µg/kg	95.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	5 µg/kg	99.2	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	5 µg/kg	108	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	5 µg/kg	98.4	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4159828)							

Sub-Matrix: **BIOTA**

				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: 4159828) - continued							
ES2203382-060	1302_QC135_211124	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	5 µg/kg	88.8	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	5 µg/kg	97.6	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	5 µg/kg	106	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	5 µg/kg	113	93.4	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2203382**	Page	: 1 of 13
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 02-Feb-2022
Site	: ----	Issue Date	: 17-Feb-2022
Sampler	: [redacted]	No. of samples received	: 71
Order number	: 60612531	No. of samples analysed	: 71

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.**
- **Laboratory Control outliers exist - please see following pages for full details.**
- **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: **BIOTA**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	QC-4159827-002	----	**N-Methyl perfluorooctane sulfonamide (MeFOSA)**	31506-32-8	109 %	88.1-105%	**Recovery greater than upper control limit**
EP231C: Perfluoroalkyl Sulfonamides	QC-4159828-002	----	**N-Methyl perfluorooctane sulfonamide (MeFOSA)**	31506-32-8	112 %	88.1-105%	**Recovery greater than upper control limit**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	QC-4159826-002	----	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	83.2 %	93.4-130%	**Recovery less than lower control limit**
Matrix Spike (MS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	ES2203382--022	1302_BIOAFA225_211125	**N-Methyl perfluorooctane sulfonamide (MeFOSA)**	31506-32-8	109 %	88.1-105%	**Recovery greater than upper data quality objective**
EP231C: Perfluoroalkyl Sulfonamides	ES2203382--042	1302_BIOAFA245_211124	**N-Methyl perfluorooctane sulfonamide (MeFOSA)**	31506-32-8	119 %	88.1-105%	**Recovery greater than upper data quality objective**
EP231C: Perfluoroalkyl Sulfonamides	ES2203382--060	1302_QC135_211124	**N-Methyl perfluorooctane sulfonamide (MeFOSA)**	31506-32-8	114 %	88.1-105%	**Recovery greater than upper data quality objective**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	ES2203382--022	1302_BIOAFA225_211125	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	76.0 %	93.4-130%	**Recovery less than lower data quality objective**

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	0	19	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	19	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: **BIOTA**

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
Biota Sample Pre-Preparation							
Frozen Sample (Biota-PP) 1302_BIOAFA230_211203, 1302_BIOAFA231_211203, 1302_BIOAFA232_211203, 1302_BIOAFA233_211203, 1302_BIOAFA234_211203, 1302_BIOAFA235_211203, 1302_BIOAFA236_211203	**03-Dec-2021**	**08-Feb-2022**	----	----	**----**	----	----
Frozen Sample (Biota-PP) 1302_BIOAFA204_211108, 1302_BIOAFA205_211108, 1302_BIOAFA206_211108, 1302_BIOAFA207_211108, 1302_BIOAFA208_211108	**08-Nov-2021**	**08-Feb-2022**	----	----	**----**	----	----
Frozen Sample (Biota-PP) 1302_BIOAFA215_211112, 1302_BIOAFA216_211112, 1302_BIOAFA217_211112	**12-Nov-2021**	**08-Feb-2022**	----	----	**----**	----	----
Frozen Sample (Biota-PP) 1302_BIOAFA209_211113, 1302_BIOAFA210_211113, 1302_BIOAFA211_211113	**13-Nov-2021**	**08-Feb-2022**	----	----	**----**	----	----
Frozen Sample (Biota-PP) 1302_BIOAFA212_211114, 1302_BIOAFA213_211114, 1302_BIOAFA214_211114	**14-Nov-2021**	**08-Feb-2022**	----	----	**----**	----	----
Frozen Sample (Biota-PP) 1302_BIOAFA237_211124, 1302_BIOAFA238_211124, 1302_BIOAFA239_211124, 1302_BIOAFA240_211124, 1302_BIOAFA241_211124, 1302_BIOAFA242_211124, 1302_BIOAFA243_211124, 1302_BIOAFA244_211124, 1302_BIOAFA245_211124, 1302_BIOAFA246_211124, 1302_BIOAFA247_211124, 1302_BIOAFA248_211124, 1302_BIOAFA249_211124, 1302_BIOAFA250_211124, 1302_BIOAFA251_211124, 1302_BIOAFA252_211124, 1302_BIOAFA253_211124, 1302_BIOAFA254_211124, 1302_BIOAFA255_211124, 1302_BIOAFA256_211124, 1302_BIOAFA257_211124, 1302_QC135_211124, 1302_QC136_211124, 1302_QC137_211124, 1302_QC138_211124	**24-Nov-2021**	**08-Feb-2022**	----	----	**----**	----	----
Frozen Sample (Biota-PP)							

Matrix: **BIOTA**

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
Biota Sample Pre-Preparation - Continued								
1302_BIOAFA218_211125,	1302_BIOAFA219_211125,	**25-Nov-2021**	**08-Feb-2022**	----	----	**----**	----	----
1302_BIOAFA220_211125,	1302_BIOAFA221_211125,							
1302_BIOAFA222_211125,	1302_BIOAFA223_211125,							
1302_BIOAFA224_211125,	1302_BIOAFA225_211125,							
1302_BIOAFA226_211125,	1302_BIOAFA227_211125,							
1302_BIOAFA228_211125,	1302_BIOAFA229_211125,							
1302_QC131_211125,	1302_QC132_211125,							
1302_QC133_211125,	1302_QC134_211125							

Matrix: **BIOTA**

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							
Frozen Sample (EP231-PFOS-SP) 1302_BIOAFA230_211203, 1302_BIOAFA231_211203, 1302_BIOAFA232_211203, 1302_BIOAFA233_211203, 1302_BIOAFA234_211203, 1302_BIOAFA235_211203, 1302_BIOAFA236_211203	**03-Dec-2021**	**11-Feb-2022**	01-Jun-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231-PFOS-SP) 1302_BIOAFA204_211108, 1302_BIOAFA205_211108, 1302_BIOAFA206_211108, 1302_BIOAFA207_211108, 1302_BIOAFA208_211108	**08-Nov-2021**	**11-Feb-2022**	07-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231-PFOS-SP) 1302_BIOAFA215_211112, 1302_BIOAFA216_211112, 1302_BIOAFA217_211112	**12-Nov-2021**	**11-Feb-2022**	11-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231-PFOS-SP) 1302_BIOAFA209_211113, 1302_BIOAFA210_211113, 1302_BIOAFA211_211113	**13-Nov-2021**	**11-Feb-2022**	12-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231-PFOS-SP) 1302_BIOAFA212_211114, 1302_BIOAFA213_211114, 1302_BIOAFA214_211114	**14-Nov-2021**	**11-Feb-2022**	13-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231-PFOS-SP) 1302_BIOAFA237_211124, 1302_BIOAFA238_211124, 1302_BIOAFA239_211124, 1302_BIOAFA240_211124, 1302_BIOAFA241_211124, 1302_BIOAFA242_211124, 1302_BIOAFA243_211124	**24-Nov-2021**	**11-Feb-2022**	23-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231-PFOS-SP) 1302_BIOAFA244_211124, 1302_BIOAFA245_211124, 1302_BIOAFA246_211124, 1302_BIOAFA247_211124, 1302_BIOAFA248_211124, 1302_BIOAFA249_211124, 1302_BIOAFA250_211124, 1302_BIOAFA251_211124, 1302_BIOAFA252_211124, 1302_BIOAFA253_211124, 1302_BIOAFA254_211124, 1302_BIOAFA255_211124, 1302_BIOAFA256_211124, 1302_BIOAFA257_211124, 1302_QC135_211124, 1302_QC136_211124, 1302_QC137_211124, 1302_QC138_211124	**24-Nov-2021**	**11-Feb-2022**	23-May-2022	✓	**14-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231-PFOS-SP) 1302_BIOAFA218_211125, 1302_BIOAFA219_211125, 1302_BIOAFA220_211125, 1302_BIOAFA221_211125, 1302_BIOAFA222_211125, 1302_BIOAFA223_211125, 1302_BIOAFA224_211125, 1302_BIOAFA225_211125, 1302_BIOAFA226_211125, 1302_BIOAFA227_211125, 1302_BIOAFA228_211125, 1302_BIOAFA229_211125	**25-Nov-2021**	**11-Feb-2022**	24-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231-PFOS-SP) 1302_QC131_211125, 1302_QC132_211125, 1302_QC133_211125, 1302_QC134_211125	**25-Nov-2021**	**11-Feb-2022**	24-May-2022	✓	**14-Feb-2022**	23-Mar-2022	✓

Matrix: **BIOTA**

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							
Frozen Sample (EP231X) 1302_BIOAFA230_211203, 1302_BIOAFA231_211203, 1302_BIOAFA232_211203, 1302_BIOAFA233_211203, 1302_BIOAFA234_211203, 1302_BIOAFA235_211203, 1302_BIOAFA236_211203	**03-Dec-2021**	**11-Feb-2022**	01-Jun-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA204_211108, 1302_BIOAFA205_211108, 1302_BIOAFA206_211108, 1302_BIOAFA207_211108, 1302_BIOAFA208_211108	**08-Nov-2021**	**11-Feb-2022**	07-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA215_211112, 1302_BIOAFA216_211112, 1302_BIOAFA217_211112	**12-Nov-2021**	**11-Feb-2022**	11-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA209_211113, 1302_BIOAFA210_211113, 1302_BIOAFA211_211113	**13-Nov-2021**	**11-Feb-2022**	12-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA212_211114, 1302_BIOAFA213_211114, 1302_BIOAFA214_211114	**14-Nov-2021**	**11-Feb-2022**	13-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA237_211124, 1302_BIOAFA238_211124, 1302_BIOAFA239_211124, 1302_BIOAFA240_211124, 1302_BIOAFA241_211124, 1302_BIOAFA242_211124, 1302_BIOAFA243_211124	**24-Nov-2021**	**11-Feb-2022**	23-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA244_211124, 1302_BIOAFA245_211124, 1302_BIOAFA246_211124, 1302_BIOAFA247_211124, 1302_BIOAFA248_211124, 1302_BIOAFA249_211124, 1302_BIOAFA250_211124, 1302_BIOAFA251_211124, 1302_BIOAFA252_211124, 1302_BIOAFA253_211124, 1302_BIOAFA254_211124, 1302_BIOAFA255_211124, 1302_BIOAFA256_211124, 1302_BIOAFA257_211124, 1302_QC135_211124, 1302_QC136_211124, 1302_QC137_211124, 1302_QC138_211124	**24-Nov-2021**	**11-Feb-2022**	23-May-2022	✓	**14-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA218_211125, 1302_BIOAFA219_211125, 1302_BIOAFA220_211125, 1302_BIOAFA221_211125, 1302_BIOAFA222_211125, 1302_BIOAFA223_211125, 1302_BIOAFA224_211125, 1302_BIOAFA225_211125, 1302_BIOAFA226_211125, 1302_BIOAFA227_211125, 1302_BIOAFA228_211125, 1302_BIOAFA229_211125	**25-Nov-2021**	**11-Feb-2022**	24-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_QC131_211125, 1302_QC132_211125, 1302_QC133_211125, 1302_QC134_211125	**25-Nov-2021**	**11-Feb-2022**	24-May-2022	✓	**14-Feb-2022**	23-Mar-2022	✓

Matrix: **BIOTA**

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							
Frozen Sample (EP231X) 1302_BIOAFA230_211203, 1302_BIOAFA231_211203, 1302_BIOAFA232_211203, 1302_BIOAFA233_211203, 1302_BIOAFA234_211203, 1302_BIOAFA235_211203, 1302_BIOAFA236_211203	**03-Dec-2021**	**11-Feb-2022**	01-Jun-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA204_211108, 1302_BIOAFA205_211108, 1302_BIOAFA206_211108, 1302_BIOAFA207_211108, 1302_BIOAFA208_211108	**08-Nov-2021**	**11-Feb-2022**	07-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA215_211112, 1302_BIOAFA216_211112, 1302_BIOAFA217_211112	**12-Nov-2021**	**11-Feb-2022**	11-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA209_211113, 1302_BIOAFA210_211113, 1302_BIOAFA211_211113	**13-Nov-2021**	**11-Feb-2022**	12-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA212_211114, 1302_BIOAFA213_211114, 1302_BIOAFA214_211114	**14-Nov-2021**	**11-Feb-2022**	13-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA237_211124, 1302_BIOAFA238_211124, 1302_BIOAFA239_211124, 1302_BIOAFA240_211124, 1302_BIOAFA241_211124, 1302_BIOAFA242_211124, 1302_BIOAFA243_211124	**24-Nov-2021**	**11-Feb-2022**	23-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA244_211124, 1302_BIOAFA245_211124, 1302_BIOAFA246_211124, 1302_BIOAFA247_211124, 1302_BIOAFA248_211124, 1302_BIOAFA249_211124, 1302_BIOAFA250_211124, 1302_BIOAFA251_211124, 1302_BIOAFA252_211124, 1302_BIOAFA253_211124, 1302_BIOAFA254_211124, 1302_BIOAFA255_211124, 1302_BIOAFA256_211124, 1302_BIOAFA257_211124, 1302_QC135_211124, 1302_QC136_211124, 1302_QC137_211124, 1302_QC138_211124	**24-Nov-2021**	**11-Feb-2022**	23-May-2022	✓	**14-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA218_211125, 1302_BIOAFA219_211125, 1302_BIOAFA220_211125, 1302_BIOAFA221_211125, 1302_BIOAFA222_211125, 1302_BIOAFA223_211125, 1302_BIOAFA224_211125, 1302_BIOAFA225_211125, 1302_BIOAFA226_211125, 1302_BIOAFA227_211125, 1302_BIOAFA228_211125, 1302_BIOAFA229_211125	**25-Nov-2021**	**11-Feb-2022**	24-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_QC131_211125, 1302_QC132_211125, 1302_QC133_211125, 1302_QC134_211125	**25-Nov-2021**	**11-Feb-2022**	24-May-2022	✓	**14-Feb-2022**	23-Mar-2022	✓

Matrix: **BIOTA**

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							
Frozen Sample (EP231X) 1302_BIOAFA230_211203, 1302_BIOAFA231_211203, 1302_BIOAFA232_211203, 1302_BIOAFA233_211203, 1302_BIOAFA234_211203, 1302_BIOAFA235_211203, 1302_BIOAFA236_211203	**03-Dec-2021**	**11-Feb-2022**	01-Jun-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA204_211108, 1302_BIOAFA205_211108, 1302_BIOAFA206_211108, 1302_BIOAFA207_211108, 1302_BIOAFA208_211108	**08-Nov-2021**	**11-Feb-2022**	07-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA215_211112, 1302_BIOAFA216_211112, 1302_BIOAFA217_211112	**12-Nov-2021**	**11-Feb-2022**	11-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA209_211113, 1302_BIOAFA210_211113, 1302_BIOAFA211_211113	**13-Nov-2021**	**11-Feb-2022**	12-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA212_211114, 1302_BIOAFA213_211114, 1302_BIOAFA214_211114	**14-Nov-2021**	**11-Feb-2022**	13-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA237_211124, 1302_BIOAFA238_211124, 1302_BIOAFA239_211124, 1302_BIOAFA240_211124, 1302_BIOAFA241_211124, 1302_BIOAFA242_211124, 1302_BIOAFA243_211124	**24-Nov-2021**	**11-Feb-2022**	23-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA244_211124, 1302_BIOAFA245_211124, 1302_BIOAFA246_211124, 1302_BIOAFA247_211124, 1302_BIOAFA248_211124, 1302_BIOAFA249_211124, 1302_BIOAFA250_211124, 1302_BIOAFA251_211124, 1302_BIOAFA252_211124, 1302_BIOAFA253_211124, 1302_BIOAFA254_211124, 1302_BIOAFA255_211124, 1302_BIOAFA256_211124, 1302_BIOAFA257_211124, 1302_QC135_211124, 1302_QC136_211124, 1302_QC137_211124, 1302_QC138_211124	**24-Nov-2021**	**11-Feb-2022**	23-May-2022	✓	**14-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA218_211125, 1302_BIOAFA219_211125, 1302_BIOAFA220_211125, 1302_BIOAFA221_211125, 1302_BIOAFA222_211125, 1302_BIOAFA223_211125, 1302_BIOAFA224_211125, 1302_BIOAFA225_211125, 1302_BIOAFA226_211125, 1302_BIOAFA227_211125, 1302_BIOAFA228_211125, 1302_BIOAFA229_211125	**25-Nov-2021**	**11-Feb-2022**	24-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_QC131_211125, 1302_QC132_211125, 1302_QC133_211125, 1302_QC134_211125	**25-Nov-2021**	**11-Feb-2022**	24-May-2022	✓	**14-Feb-2022**	23-Mar-2022	✓

Matrix: **BIOTA**

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
EP231P: PFAS Sums							
Frozen Sample (EP231X) 1302_BIOAFA230_211203, 1302_BIOAFA231_211203, 1302_BIOAFA232_211203, 1302_BIOAFA233_211203, 1302_BIOAFA234_211203, 1302_BIOAFA235_211203, 1302_BIOAFA236_211203	**03-Dec-2021**	**11-Feb-2022**	01-Jun-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA204_211108, 1302_BIOAFA205_211108, 1302_BIOAFA206_211108, 1302_BIOAFA207_211108, 1302_BIOAFA208_211108	**08-Nov-2021**	**11-Feb-2022**	07-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA215_211112, 1302_BIOAFA216_211112, 1302_BIOAFA217_211112	**12-Nov-2021**	**11-Feb-2022**	11-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA209_211113, 1302_BIOAFA210_211113, 1302_BIOAFA211_211113	**13-Nov-2021**	**11-Feb-2022**	12-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA212_211114, 1302_BIOAFA213_211114, 1302_BIOAFA214_211114	**14-Nov-2021**	**11-Feb-2022**	13-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA237_211124, 1302_BIOAFA238_211124, 1302_BIOAFA239_211124, 1302_BIOAFA240_211124, 1302_BIOAFA241_211124, 1302_BIOAFA242_211124, 1302_BIOAFA243_211124	**24-Nov-2021**	**11-Feb-2022**	23-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA244_211124, 1302_BIOAFA245_211124, 1302_BIOAFA246_211124, 1302_BIOAFA247_211124, 1302_BIOAFA248_211124, 1302_BIOAFA249_211124, 1302_BIOAFA250_211124, 1302_BIOAFA251_211124, 1302_BIOAFA252_211124, 1302_BIOAFA253_211124, 1302_BIOAFA254_211124, 1302_BIOAFA255_211124, 1302_BIOAFA256_211124, 1302_BIOAFA257_211124, 1302_QC135_211124, 1302_QC136_211124, 1302_QC137_211124, 1302_QC138_211124	**24-Nov-2021**	**11-Feb-2022**	23-May-2022	✓	**14-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_BIOAFA218_211125, 1302_BIOAFA219_211125, 1302_BIOAFA220_211125, 1302_BIOAFA221_211125, 1302_BIOAFA222_211125, 1302_BIOAFA223_211125, 1302_BIOAFA224_211125, 1302_BIOAFA225_211125, 1302_BIOAFA226_211125, 1302_BIOAFA227_211125, 1302_BIOAFA228_211125, 1302_BIOAFA229_211125	**25-Nov-2021**	**11-Feb-2022**	24-May-2022	✓	**11-Feb-2022**	23-Mar-2022	✓
Frozen Sample (EP231X) 1302_QC131_211125, 1302_QC132_211125, 1302_QC133_211125, 1302_QC134_211125	**25-Nov-2021**	**11-Feb-2022**	24-May-2022	✓	**14-Feb-2022**	23-Mar-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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1302_QC130_211203, 1302_SW014_211203, 1302_SW013_211203,	**03-Dec-2021**	**14-Feb-2022**	01-Jun-2022	✓	**14-Feb-2022**	01-Jun-2022	✓
HDPE (no PTFE) (EP231X) 1302_SW015_211109	**09-Nov-2021**	**14-Feb-2022**	08-May-2022	✓	**14-Feb-2022**	08-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_SW016_211112, 1302_SW018_211112, 1302_SW017_211112,	**12-Nov-2021**	**14-Feb-2022**	11-May-2022	✓	**14-Feb-2022**	11-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_QC503_211115	**15-Nov-2021**	**14-Feb-2022**	14-May-2022	✓	**14-Feb-2022**	14-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_QC303_220127	**27-Jan-2022**	**14-Feb-2022**	26-Jul-2022	✓	**14-Feb-2022**	26-Jul-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 1302_QC130_211203, 1302_SW014_211203, 1302_SW013_211203,	**03-Dec-2021**	**14-Feb-2022**	01-Jun-2022	✓	**14-Feb-2022**	01-Jun-2022	✓
HDPE (no PTFE) (EP231X) 1302_SW015_211109	**09-Nov-2021**	**14-Feb-2022**	08-May-2022	✓	**14-Feb-2022**	08-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_SW016_211112, 1302_SW018_211112, 1302_SW017_211112,	**12-Nov-2021**	**14-Feb-2022**	11-May-2022	✓	**14-Feb-2022**	11-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_QC503_211115	**15-Nov-2021**	**14-Feb-2022**	14-May-2022	✓	**14-Feb-2022**	14-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_QC303_220127	**27-Jan-2022**	**14-Feb-2022**	26-Jul-2022	✓	**14-Feb-2022**	26-Jul-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 1302_QC130_211203, 1302_SW014_211203, 1302_SW013_211203,	**03-Dec-2021**	**14-Feb-2022**	01-Jun-2022	✓	**14-Feb-2022**	01-Jun-2022	✓
HDPE (no PTFE) (EP231X) 1302_SW015_211109	**09-Nov-2021**	**14-Feb-2022**	08-May-2022	✓	**14-Feb-2022**	08-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_SW016_211112, 1302_SW018_211112, 1302_SW017_211112,	**12-Nov-2021**	**14-Feb-2022**	11-May-2022	✓	**14-Feb-2022**	11-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_QC503_211115	**15-Nov-2021**	**14-Feb-2022**	14-May-2022	✓	**14-Feb-2022**	14-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_QC303_220127	**27-Jan-2022**	**14-Feb-2022**	26-Jul-2022	✓	**14-Feb-2022**	26-Jul-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
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1302_QC130_211203, 1302_SW013_211203, 1302_SW014_211203	**03-Dec-2021**	**14-Feb-2022**	01-Jun-2022	✓	**14-Feb-2022**	01-Jun-2022	✓
HDPE (no PTFE) (EP231X) 1302_SW015_211109	**09-Nov-2021**	**14-Feb-2022**	08-May-2022	✓	**14-Feb-2022**	08-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_SW016_211112, 1302_SW017_211112, 1302_SW018_211112	**12-Nov-2021**	**14-Feb-2022**	11-May-2022	✓	**14-Feb-2022**	11-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_QC503_211115	**15-Nov-2021**	**14-Feb-2022**	14-May-2022	✓	**14-Feb-2022**	14-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_QC303_220127	**27-Jan-2022**	**14-Feb-2022**	26-Jul-2022	✓	**14-Feb-2022**	26-Jul-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 1302_QC130_211203, 1302_SW013_211203, 1302_SW014_211203	**03-Dec-2021**	**14-Feb-2022**	01-Jun-2022	✓	**14-Feb-2022**	01-Jun-2022	✓
HDPE (no PTFE) (EP231X) 1302_SW015_211109	**09-Nov-2021**	**14-Feb-2022**	08-May-2022	✓	**14-Feb-2022**	08-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_SW016_211112, 1302_SW017_211112, 1302_SW018_211112	**12-Nov-2021**	**14-Feb-2022**	11-May-2022	✓	**14-Feb-2022**	11-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_QC503_211115	**15-Nov-2021**	**14-Feb-2022**	14-May-2022	✓	**14-Feb-2022**	14-May-2022	✓
HDPE (no PTFE) (EP231X) 1302_QC303_220127	**27-Jan-2022**	**14-Feb-2022**	26-Jul-2022	✓	**14-Feb-2022**	26-Jul-2022	✓

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: **BIOTA**

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	7	62	**11.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	62	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	62	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	62	**6.45**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	19	**0.00**	**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	0	19	**0.00**	**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
PFOS - Linear/Branched Speciation	EP231-PFOS-SP	BIOTA	In-house: Linear PFOS is determined by quantiation of the separate linear peak using linear PFOS. Branched PFOS is determined as the difference between total PFOS (determined using a mixed linear/branched standard) and linear PFOS.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	BIOTA	In-house: A sample extract is analysed 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 biota which is then solvent extracted. 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.
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
Prep-Preparation for Biota Analysis	* Biota-PP	BIOTA	A sample is prepared from whole or particular tissues/organs, identified, homogenised and the total weight of prepared sample recorded.
Sample Preparation for PFAS in Biota	EP231-PR	BIOTA	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of homogenised biota 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 conform to US DoD QSM 5.3, table B-15 requirements.
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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2208419**	Page	: 1 of 23
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted] DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 11-Mar-2022 12:30
Order number	: -	Date Analysis Commenced	: 14-Mar-2022
C-O-C number	: 34744	Issue Date	: 21-Mar-2022 16:54
Sampler	: [redacted]		
Site	: 1302_RAAFDARWIN		
Quote number	: SY/139/19 V3		
No. of samples received	: 44		
No. of samples analysed	: 44		

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*
[redacted]	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 Contact 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.
- Amendment (21/03/2022):This report has been amended to update sample ID 1302_MW421_220309 to 1302_MW241_220309 as per an email request from [redacted].
- 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	1302_MW128_220307	1302_QC400_220307	1302_QC100_220307	1302_QC500_220307	1302_MW103_220307
				Sampling date / time	07-Mar-2022 13:56	07-Mar-2022 13:57	07-Mar-2022 14:00	07-Mar-2022 14:01	07-Mar-2022 14:22
					ES2208419-001	ES2208419-002	ES2208419-004	ES2208419-005	ES2208419-006
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.15**	<0.02	**0.16**	<0.02	**0.25**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.17**	<0.02	**0.17**	<0.02	**0.35**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.59**	<0.01	**1.57**	<0.01	**4.64**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.10**	<0.02	**0.10**	<0.02	**0.29**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**4.00**	<0.01	**4.09**	<0.01	**17.3**
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		**0.08**	<0.02	**0.09**	<0.02	**0.15**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.40**	<0.02	**0.40**	<0.02	**0.95**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.04**	<0.02	**0.04**	<0.02	**0.09**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.10**	<0.01	**0.10**	<0.01	**0.28**
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: GROUNDWATER (Matrix: WATER)				Sample ID	1302_MW128_220307	1302_QC400_220307	1302_QC100_220307	1302_QC500_220307	1302_MW103_220307
				Sampling date / time	07-Mar-2022 13:56	07-Mar-2022 13:57	07-Mar-2022 14:00	07-Mar-2022 14:01	07-Mar-2022 14:22
Compound	CAS Number	LOR	Unit		ES2208419-001	ES2208419-002	ES2208419-004	ES2208419-005	ES2208419-006
					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		**6.63**	<0.01	**6.72**	<0.01	**24.3**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**5.59**	<0.01	**5.66**	<0.01	**21.9**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**6.36**	<0.01	**6.45**	<0.01	**23.7**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**90.3**	**89.0**	**90.2**	**89.0**	**87.2**
13C8-PFOA	----	0.02	%		**114**	**112**	**111**	**108**	**103**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_QC401_220308	1302_MW176_220308	1302_MW200_220308	1302_MW211_220308	1302_MW180_220308
				Sampling date / time	08-Mar-2022 08:45	08-Mar-2022 08:47	08-Mar-2022 09:03	08-Mar-2022 09:16	08-Mar-2022 09:29
					ES2208419-008	ES2208419-009	ES2208419-010	ES2208419-011	ES2208419-012
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	**0.03**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	**0.03**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.05**	**0.25**	**0.04**	**0.08**
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	**0.08**	**0.36**	**0.06**	<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	**0.04**	<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: GROUNDWATER (Matrix: WATER)				Sample ID	1302_QC401_220308	1302_MW176_220308	1302_MW200_220308	1302_MW211_220308	1302_MW180_220308
				Sampling date / time	08-Mar-2022 08:45	08-Mar-2022 08:47	08-Mar-2022 09:03	08-Mar-2022 09:16	08-Mar-2022 09:29
Compound	CAS Number	LOR	Unit		ES2208419-008	ES2208419-009	ES2208419-010	ES2208419-011	ES2208419-012
					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	**0.13**	**0.71**	**0.10**	**0.08**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.13**	**0.61**	**0.10**	**0.08**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.13**	**0.68**	**0.10**	**0.08**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**84.8**	**97.8**	**96.8**	**101**	**93.9**
13C8-PFOA	----	0.02	%		**105**	**105**	**104**	**99.7**	**98.9**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW201_220308	1302_MW452_220308	1302_MW451_220308	1302_MW133_220308	1302_MW303_220308
				Sampling date / time	08-Mar-2022 09:59	08-Mar-2022 10:10	08-Mar-2022 10:19	08-Mar-2022 11:59	08-Mar-2022 13:14
					ES2208419-013	ES2208419-014	ES2208419-015	ES2208419-017	ES2208419-018
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.07**	<0.02	**0.50**	**1.62**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.09**	<0.02	**0.66**	**2.10**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.01**	**0.89**	**0.02**	**6.32**	**13.0**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.05**	<0.02	**0.70**	**1.05**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.01**	**1.86**	**0.03**	**30.4**	**18.8**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	**0.05**	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	**0.1**	**0.3**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.02**	<0.02	**0.32**	**0.53**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.15**	<0.02	**2.35**	**3.54**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.02**	<0.02	**0.20**	**0.35**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.05**	<0.01	**0.53**	**0.77**
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	**0.06**	**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: GROUNDWATER (Matrix: WATER)				Sample ID	1302_MW201_220308	1302_MW452_220308	1302_MW451_220308	1302_MW133_220308	1302_MW303_220308
				Sampling date / time	08-Mar-2022 09:59	08-Mar-2022 10:10	08-Mar-2022 10:19	08-Mar-2022 11:59	08-Mar-2022 13:14
Compound	CAS Number	LOR	Unit		ES2208419-013	ES2208419-014	ES2208419-015	ES2208419-017	ES2208419-018
					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		**0.02**	**3.20**	**0.05**	**42.2**	**42.1**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	**2.75**	**0.05**	**36.7**	**31.8**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	**3.06**	**0.05**	**40.7**	**38.9**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.8**	**97.3**	**97.5**	**94.9**	**97.7**
13C8-PFOA	----	0.02	%		**97.3**	**97.3**	**96.2**	**94.2**	**90.3**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	1302_QC101_220308	1302_MW297_220308	1302_MW185_220308	1302_MW195_220308	1302_MW194_220308
				Sampling date / time	08-Mar-2022 13:15	08-Mar-2022 13:56	08-Mar-2022 16:02	08-Mar-2022 16:20	08-Mar-2022 16:32
Compound	CAS Number	LOR	Unit		ES2208419-019	ES2208419-020	ES2208419-021	ES2208419-022	ES2208419-023
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**1.99**	**0.03**	<0.02	<0.02	**0.13**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**2.54**	**0.04**	<0.02	<0.02	**0.14**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**13.8**	**0.37**	**0.02**	**0.08**	**1.23**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**1.24**	<0.02	<0.02	<0.02	**0.08**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**19.1**	**1.07**	<0.01	**0.12**	**2.41**
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		**0.63**	<0.02	<0.02	<0.02	**0.06**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**4.11**	**0.10**	<0.02	<0.02	**0.36**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.39**	<0.02	<0.02	<0.02	**0.02**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.84**	**0.02**	<0.01	<0.01	**0.06**
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: GROUNDWATER (Matrix: WATER)				Sample ID	1302_QC101_220308	1302_MW297_220308	1302_MW185_220308	1302_MW195_220308	1302_MW194_220308
				Sampling date / time	08-Mar-2022 13:15	08-Mar-2022 13:56	08-Mar-2022 16:02	08-Mar-2022 16:20	08-Mar-2022 16:32
Compound	CAS Number	LOR	Unit		ES2208419-019	ES2208419-020	ES2208419-021	ES2208419-022	ES2208419-023
					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		**0.06**	<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		**45.1**	**1.63**	**0.02**	**0.20**	**4.49**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**32.9**	**1.44**	**0.02**	**0.20**	**3.64**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**41.3**	**1.59**	**0.02**	**0.20**	**4.27**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.8**	**106**	**92.7**	**81.0**	**84.2**
13C8-PFOA	----	0.02	%		**93.6**	**89.0**	**89.9**	**110**	**114**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	1302_MW190_220308	1302_MW191_220308	1302_MW210_220308	1302_MW209_220308	1302_MW107_220309
				Sampling date / time	08-Mar-2022 16:43	08-Mar-2022 16:54	08-Mar-2022 17:12	08-Mar-2022 17:28	09-Mar-2022 10:09
Compound	CAS Number	LOR	Unit		ES2208419-024	ES2208419-025	ES2208419-026	ES2208419-027	ES2208419-028
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.07**	**0.04**	<0.02	**0.24**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.09**	**0.05**	<0.02	**0.33**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.01**	**0.81**	**0.50**	<0.01	**3.06**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.04**	**0.02**	<0.02	**0.20**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.02**	**1.26**	**0.82**	<0.01	**5.40**
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	**0.03**	<0.02	<0.02	**0.16**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.17**	**0.08**	<0.02	**0.79**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.07**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.03**	**0.02**	<0.01	**0.16**
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: GROUNDWATER (Matrix: WATER)				Sample ID	1302_MW190_220308	1302_MW191_220308	1302_MW210_220308	1302_MW209_220308	1302_MW107_220309
				Sampling date / time	08-Mar-2022 16:43	08-Mar-2022 16:54	08-Mar-2022 17:12	08-Mar-2022 17:28	09-Mar-2022 10:09
Compound	CAS Number	LOR	Unit		ES2208419-024	ES2208419-025	ES2208419-026	ES2208419-027	ES2208419-028
					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		**0.03**	**2.50**	**1.53**	<0.01	**10.4**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.03**	**2.07**	**1.32**	<0.01	**8.46**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	**2.37**	**1.46**	<0.01	**9.88**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**83.9**	**88.5**	**84.7**	**86.0**	**87.0**
13C8-PFOA	----	0.02	%		**114**	**109**	**115**	**115**	**115**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	1302_QC402_220309	1302_MW241_220309	1302_QC102_220309	1302_MW197_220309	1302_MW240_220309
				Sampling date / time	09-Mar-2022 10:28	09-Mar-2022 10:29	09-Mar-2022 10:30	09-Mar-2022 10:51	09-Mar-2022 11:01
Compound	CAS Number	LOR	Unit		ES2208419-029	ES2208419-030	ES2208419-031	ES2208419-033	ES2208419-034
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**1.21**	**1.24**	**0.20**	**1.55**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.80**	**0.80**	**0.27**	**1.28**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**6.30**	**6.26**	**2.58**	**7.34**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.69**	**0.66**	**0.15**	**0.80**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	**19.0**	**18.3**	**4.90**	**19.2**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.06**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**1.2**	**1.2**	<0.1	**1.4**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**2.47**	**2.47**	**0.11**	**2.89**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**5.59**	**5.53**	**0.68**	**6.79**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**2.30**	**2.36**	**0.04**	**2.76**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**3.10**	**3.07**	**0.12**	**3.71**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.80**	**0.77**	<0.02	**0.89**
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	**0.09**	**0.08**	<0.02	**0.22**
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	**0.07**
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: GROUNDWATER (Matrix: WATER)				Sample ID	1302_QC402_220309	1302_MW241_220309	1302_QC102_220309	1302_MW197_220309	1302_MW240_220309
				Sampling date / time	09-Mar-2022 10:28	09-Mar-2022 10:29	09-Mar-2022 10:30	09-Mar-2022 10:51	09-Mar-2022 11:01
Compound	CAS Number	LOR	Unit		ES2208419-029	ES2208419-030	ES2208419-031	ES2208419-033	ES2208419-034
					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	**0.37**	**0.36**	<0.05	**0.32**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	**1.32**	**1.26**	<0.05	**2.43**
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	**45.2**	**44.4**	**9.05**	**51.7**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**25.3**	**24.6**	**7.48**	**26.5**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**42.9**	**42.0**	**8.63**	**48.4**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**85.6**	**84.3**	**89.0**	**88.9**	**82.4**
13C8-PFOA	----	0.02	%		**114**	**113**	**111**	**115**	**114**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	1302_MW453_220309	1302_MW144_220309	1302_MW141_220309	1302_QC103_220309	1302_MW139_220309
				Sampling date / time	09-Mar-2022 11:11	09-Mar-2022 11:35	09-Mar-2022 11:55	09-Mar-2022 11:56	09-Mar-2022 12:10
Compound	CAS Number	LOR	Unit		ES2208419-035	ES2208419-036	ES2208419-037	ES2208419-038	ES2208419-039
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**1.09**	**0.14**	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.90**	**0.13**	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**4.52**	**0.99**	**0.16**	**0.18**	**0.14**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.28**	**0.06**	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**3.66**	**1.16**	**0.13**	**0.15**	**0.27**
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	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**2.05**	**0.02**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**4.97**	**0.16**	<0.02	<0.02	**0.03**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**1.93**	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**2.34**	**0.03**	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.24**	<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: GROUNDWATER (Matrix: WATER)				Sample ID	1302_MW453_220309	1302_MW144_220309	1302_MW141_220309	1302_QC103_220309	1302_MW139_220309
				Sampling date / time	09-Mar-2022 11:11	09-Mar-2022 11:35	09-Mar-2022 11:55	09-Mar-2022 11:56	09-Mar-2022 12:10
Compound	CAS Number	LOR	Unit		ES2208419-035	ES2208419-036	ES2208419-037	ES2208419-038	ES2208419-039
					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		**0.29**	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		**0.11**	<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		**23.4**	**2.69**	**0.29**	**0.33**	**0.44**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**8.18**	**2.15**	**0.29**	**0.33**	**0.41**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**22.0**	**2.50**	**0.29**	**0.33**	**0.44**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**85.1**	**85.0**	**84.5**	**85.1**	**83.1**
13C8-PFOA	----	0.02	%		**115**	**116**	**115**	**112**	**116**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW422_220309	1302_MW454_220309	1302_MW112_220310	1302_QC403_220310	1302_MW205_220310
				Sampling date / time	09-Mar-2022 12:20	09-Mar-2022 12:25	10-Mar-2022 10:02	10-Mar-2022 10:03	10-Mar-2022 10:21
					ES2208419-040	ES2208419-041	ES2208419-042	ES2208419-043	ES2208419-044
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**39.4**	**2.27**	**0.32**	<0.02	**0.26**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**33.2**	**2.76**	**0.30**	<0.02	**0.23**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**235**	**14.2**	**2.26**	<0.01	**1.56**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**9.88**	**1.45**	**0.16**	<0.02	**0.10**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**93.3**	**22.0**	**6.88**	<0.01	**2.45**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		**0.20**	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**6.3**	**0.3**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**14.0**	**0.74**	**0.14**	<0.02	**0.07**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**71.2**	**4.00**	**0.90**	<0.02	**0.40**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**5.65**	**0.26**	**0.06**	<0.02	**0.05**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**12.5**	**0.64**	**0.16**	<0.01	**0.09**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.10**	<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		**0.09**	<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: GROUNDWATER (Matrix: WATER)				Sample ID	1302_MW422_220309	1302_MW454_220309	1302_MW112_220310	1302_QC403_220310	1302_MW205_220310
				Sampling date / time	09-Mar-2022 12:20	09-Mar-2022 12:25	10-Mar-2022 10:02	10-Mar-2022 10:03	10-Mar-2022 10:21
Compound	CAS Number	LOR	Unit		ES2208419-040	ES2208419-041	ES2208419-042	ES2208419-043	ES2208419-044
					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		**521**	**48.6**	**11.2**	<0.01	**5.21**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**328**	**36.2**	**9.14**	<0.01	**4.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**477**	**44.4**	**10.7**	<0.01	**4.88**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**81.3**	**84.1**	**90.5**	**104**	**104**
13C8-PFOA	----	0.02	%		**108**	**112**	**113**	**90.7**	**87.5**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	1302_MW115_220310	1302_MW156_220310	----	----	----
				Sampling date / time	10-Mar-2022 10:27	10-Mar-2022 10:50	----	----	----
Compound	CAS Number	LOR	Unit		ES2208419-045	ES2208419-046	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**3.48**	**0.29**	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**3.21**	**0.28**	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**25.9**	**2.17**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**2.33**	**0.17**	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**59.3**	**5.09**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		**0.12**	<0.02	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.6**	<0.1	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**1.03**	**0.09**	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**6.92**	**0.58**	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.66**	**0.06**	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**1.76**	**0.13**	----	----	----
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		**0.23**	<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	----	----	----

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	1302_MW115_220310	1302_MW156_220310	----	----	----
				Sampling date / time	10-Mar-2022 10:27	10-Mar-2022 10:50	----	----	----
Compound	CAS Number	LOR	Unit		ES2208419-045	ES2208419-046	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	----	----	----
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		**106**	**8.86**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**85.2**	**7.26**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**99.6**	**8.41**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**92.4**	**99.3**	----	----	----
13C8-PFOA	----	0.02	%		**92.4**	**90.3**	----	----	----

Analytical Results

Sub-Matrix: **RINSATE** (Matrix: **WATER**)				Sample ID	1302_QC300_220307	1302_QC301_220308	----	----	----
				Sampling date / time	07-Mar-2022 16:45	08-Mar-2022 10:27	----	----	----
Compound	CAS Number	LOR	Unit		ES2208419-007	ES2208419-016	--------	--------	--------
					Result	Result	----	----	----
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	----	----	----
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	----	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	1302_QC300_220307	1302_QC301_220308	----	----	----
				Sampling date / time	07-Mar-2022 16:45	08-Mar-2022 10:27	----	----	----
Compound	CAS Number	LOR	Unit		ES2208419-007	ES2208419-016	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	----	----	----
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	%		**91.4**	**101**	----	----	----
13C8-PFOA	----	0.02	%		**103**	**94.0**	----	----	----

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2208419**	Page	: 1 of 11
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted] DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 11-Mar-2022
Order number	: -	Date Analysis Commenced	: 14-Mar-2022
C-O-C number	: 34744	Issue Date	: 21-Mar-2022
Sampler	: [redacted]		
Site	: 1302_RAAFDARWIN		
Quote number	: SY/139/19 V3		
No. of samples received	: 44		
No. of samples analysed	: 44		

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*
[redacted]	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 (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4226531)									
ES2208419-041	1302_MW454_220309	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	14.2	13.7	3.2	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	22.0	20.9	5.2	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	2.27	2.05	10.2	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	2.76	2.82	2.0	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	1.45	1.46	0.0	0% - 20%
		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: 4226898)									
ES2207828-020	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.31	0.32	4.1	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.53	0.48	8.6	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.03	0.03	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
ES2207828-037	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: 4226531)									
ES2208419-041	1302_MW454_220309	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.64	0.65	0.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.74	0.80	7.5	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	4.00	4.30	7.1	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.26	0.26	0.0	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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4226531) - continued									
ES2208419-041	1302_MW454_220309	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	<0.1	98.5	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4226898)									
ES2207828-020	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	0.06	0.06	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
ES2207828-037	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: 4226531)									
ES2208419-041	1302_MW454_220309	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

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: 4226531) - continued									
ES2208419-041	1302_MW454_220309	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: 4226898)									
ES2207828-020	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
ES2207828-037	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: 4226531)									
ES2208419-041	1302_MW454_220309	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: 4226898)									

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: 4226898) - continued									
ES2207828-020	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
ES2207828-037	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: 4226531)									
ES2208419-041	1302_MW454_220309	EP231X: Sum of PFAS	----	0.01	µg/L	48.6	46.9	3.5	0% - 20%
EP231P: PFAS Sums (QC Lot: 4226898)									
ES2207828-020	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.97	0.93	4.2	0% - 20%
ES2207828-037	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4226529)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	99.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	96.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	96.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	91.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	82.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	86.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4226531)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	87.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	102	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	78.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	93.8	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4226898)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	89.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	87.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	96.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	94.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	86.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4226529)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	83.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	118	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	76.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	88.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	84.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	72.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	88.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	79.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	91.0	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4226531)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	80.1	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: 4226531) - continued								
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	75.6	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	74.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	79.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	76.8	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	80.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	83.1	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4226898)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	94.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	98.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	119	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	97.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	100	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	98.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	111	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	104	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4226529)								
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	95.9	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.2	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	98.1	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	98.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	79.0	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4226531)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	112	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	90.0	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	80.6	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: 4226531) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	75.9	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	75.0	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	94.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	78.0	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4226898)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	90.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	105	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	97.8	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	97.0	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	87.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4226529)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	85.8	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	95.4	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	101	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	116	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4226531)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	89.6	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	107	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	113	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4226898)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	85.0	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	92.0	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	99.4	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	115	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4226531)							
ES2208419-041	1302_MW454_220309	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	# Not Determined	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	# Not Determined	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	# Not Determined	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	80.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4226898)							
ES2207828-021	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	95.6	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	84.0	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	83.2	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	81.4	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	75.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	78.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4226531)							
ES2208419-041	1302_MW454_220309	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	89.9	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	102	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	81.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.4	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	79.8	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	87.0	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	75.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	99.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	73.0	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	81.8	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4226898)							
ES2207828-021	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	86.2	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	88.2	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	96.8	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	90.8	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	84.6	71.0	133

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: 4226898) - continued							
ES2207828-021	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	91.8	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	96.2	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	88.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	98.6	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	86.8	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	95.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4226531)							
ES2208419-041	1302_MW454_220309	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	108	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	90.6	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	88.0	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	76.5	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	72.4	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	97.2	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	78.0	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4226898)							
ES2207828-021	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	82.4	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	83.8	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	95.3	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	82.9	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	94.0	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	83.6	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	76.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4226531)							
ES2208419-041	1302_MW454_220309	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	89.2	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	99.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	100	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	117	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4226898)							

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: 4226898) - continued							
ES2207828-021	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	82.4	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	89.0	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	88.6	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	98.8	71.4	144

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2209445**	Page	: 1 of 5
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: 60612561 4.1 NT_PFASOMP	Date Samples Received	: 05-Apr-2022 08:45
Order number	: 60612561 4.1	Date Analysis Commenced	: 07-Apr-2022
C-O-C number	: ----	Issue Date	: 12-Apr-2022 13:34
Sampler	: [redacted]		
Site	: ----		
Quote number	: SY/139/19 V3_QLD		
No. of samples received	: 1		
No. of samples analysed	: 1		

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*
[redacted]	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

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 Contact 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.
- 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: WATER (Matrix: WATER)				Sample ID	1302_QC200_220401	----	----	----	----
				Sampling date / time	01-Apr-2022 10:30	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2209445-001	--------	--------	--------	--------
					Result	----	----	----	----
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		**0.04**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.30**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.57**	----	----	----	----
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		**0.07**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.02**	----	----	----	----
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: WATER (Matrix: WATER)				Sample ID	1302_QC200_220401	----	----	----	----
				Sampling date / time	01-Apr-2022 10:30	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2209445-001	--------	--------	--------	--------
					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		**1.03**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.87**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.99**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.2**	----	----	----	----
13C8-PFOA	----	0.02	%		**101**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2209445**	Page	: 1 of 6
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: JAMES GUZMAN	Contact	: Christopher Redford
Address	: GPO BOX 3175 DARWIN NT, AUSTRALIA 0801	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 60612561 4.1 NT_PFASOMP	Date Samples Received	: 05-Apr-2022
Order number	: 60612561 4.1	Date Analysis Commenced	: 07-Apr-2022
C-O-C number	: ----	Issue Date	: 12-Apr-2022
Sampler	: POPPY HARDING/PETER SZAMOSI		
Site	: ----		
Quote number	: SY/139/19 V3_QLD		
No. of samples received	: 1		
No. of samples analysed	: 1		

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*
Matt Frost	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD

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 (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4274721)									
EB2209445-001	1302_QC200_220401	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.30	0.30	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.57	0.52	8.3	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	0.04	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: 4274721)									
EB2209445-001	1302_QC200_220401	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.02	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	0.07	0.07	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: 4274721)									
EB2209445-001	1302_QC200_220401	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: 4274721) - continued									
EB2209445-001	1302_QC200_220401	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: 4274721)									
EB2209445-001	1302_QC200_220401	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: 4274721)									
EB2209445-001	1302_QC200_220401	EP231X: Sum of PFAS	----	0.01	µg/L	1.03	1.00	3.0	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.87	0.82	5.9	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.99	0.94	5.2	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4274721)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	119	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	118	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	110	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	127	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	115	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	135	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4274721)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	125	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	116	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	118	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	127	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	113	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	123	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	125	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	121	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	129	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4274721)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	132	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	112	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	118	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	126	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	117	62.6	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	135	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4274721)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	137	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	122	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	125	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: 4274721) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	126	64.2	133
EP231P: PFAS Sums (QCLot: 4274721)								
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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4274721)							
EB2209511-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	112	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	119	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	# Not Determined	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	116	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	# Not Determined	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	130	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4274721)							
EB2209511-001	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	106	73.0	129
		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	128	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	119	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	109	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	124	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	113	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	121	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	114	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	135	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	111	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4274721)							
EB2209511-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	127	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: 4274721) - continued							
EB2209511-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	107	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	119	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	110	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	121	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	126	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	133	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4274721)							
EB2209511-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	126	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	110	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	124	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	110	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2209445**	Page	: 1 of 4
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Telephone	: +[redacted]
Project	: 60612561 4.1 NT_PFASOMP	Date Samples Received	: 05-Apr-2022
Site	: ----	Issue Date	: 12-Apr-2022
Sampler	: [redacted]	No. of samples received	: 1
Order number	: 60612561 4.1	No. of samples analysed	: 1

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

- **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							
EP231A: Perfluoroalkyl Sulfonic Acids	EB2209511--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	EB2209511--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.**

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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1302_QC200_220401	**01-Apr-2022**	**07-Apr-2022**	28-Sep-2022	✓	**08-Apr-2022**	28-Sep-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 1302_QC200_220401	**01-Apr-2022**	**07-Apr-2022**	28-Sep-2022	✓	**08-Apr-2022**	28-Sep-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 1302_QC200_220401	**01-Apr-2022**	**07-Apr-2022**	28-Sep-2022	✓	**08-Apr-2022**	28-Sep-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1302_QC200_220401	**01-Apr-2022**	**07-Apr-2022**	28-Sep-2022	✓	**08-Apr-2022**	28-Sep-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 1302_QC200_220401	**01-Apr-2022**	**07-Apr-2022**	28-Sep-2022	✓	**08-Apr-2022**	28-Sep-2022	✓

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	3	**33.33**	**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
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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2207387**	Page	: 1 of 7
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 07-Mar-2022 07:30
Order number	: 60612561	Date Analysis Commenced	: 07-Mar-2022
C-O-C number	: ----	Issue Date	: 14-Mar-2022 08:38
Sampler	: [redacted]		
Site	: ----		
Quote number	: SY/139/19 V3		
No. of samples received	: 6		
No. of samples analysed	: 6		

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*
[redacted]	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 Contact 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.
- 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: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW300_220302	1302_SW109_220302	1302_QC100_220302	1302_QC400_220302	1302_QC500_220302
				Sampling date / time	02-Mar-2022 11:07	02-Mar-2022 11:49	02-Mar-2022 11:49	02-Mar-2022 00:00	02-Mar-2022 00:00
					ES2207387-001	ES2207387-002	ES2207387-003	ES2207387-004	ES2207387-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.23**	**0.03**	**0.03**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.19**	**0.02**	**0.03**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.02**	**0.22**	**0.22**	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.05**	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.14**	**0.34**	**0.35**	<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		**0.2**	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.46**	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.86**	**0.06**	**0.06**	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.27**	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.38**	**0.01**	**0.01**	<0.01	<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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW300_220302	1302_SW109_220302	1302_QC100_220302	1302_QC400_220302	1302_QC500_220302
				Sampling date / time	02-Mar-2022 11:07	02-Mar-2022 11:49	02-Mar-2022 11:49	02-Mar-2022 00:00	02-Mar-2022 00:00
Compound	CAS Number	LOR	Unit		ES2207387-001	ES2207387-002	ES2207387-003	ES2207387-004	ES2207387-005
					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		**4.85**	**0.68**	**0.70**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**2.16**	**0.56**	**0.57**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**4.56**	**0.66**	**0.67**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**84.7**	**84.6**	**79.4**	**83.6**	**76.0**
13C8-PFOA	----	0.02	%		**118**	**119**	**117**	**116**	**114**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW170_220302	----	----	----	----
				Sampling date / time	02-Mar-2022 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2207387-006	--------	--------	--------	--------
					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		**0.15**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.29**	----	----	----	----
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		**0.04**	----	----	----	----
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: WATER (Matrix: WATER)				Sample ID	1302_SW170_220302	----	----	----	----
				Sampling date / time	02-Mar-2022 15:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2207387-006	--------	--------	--------	--------
					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		**0.48**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.44**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.48**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**84.8**	----	----	----	----
13C8-PFOA	----	0.02	%		**114**	----	----	----	----

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2207387**	Page	: 1 of 4
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 07-Mar-2022
Order number	: 60612561	Date Analysis Commenced	: 07-Mar-2022
C-O-C number	: ----	Issue Date	: 14-Mar-2022
Sampler	: [redacted]		
Site	: ----		
Quote number	: SY/139/19 V3		
No. of samples received	: 6		
No. of samples analysed	: 6		

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*
[redacted]	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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4221060)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	94.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	111	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	107	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	81.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	74.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4221060)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	91.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	126	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	78.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	91.6	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	89.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	109	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	76.0	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	80.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	92.7	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4221060)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	117	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	106	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	105	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	99.0	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	78.6	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	77.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4221060)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	102	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	113	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	123	67.0	138

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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4221060) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	114	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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2207387**	Page	: 1 of 5
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 07-Mar-2022
Site	: ----	Issue Date	: 14-Mar-2022
Sampler	: [redacted]	No. of samples received	: 6
Order number	: 60612561	No. of samples analysed	: 6

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

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

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	0	18	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	18	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: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW300_220302, 1302_SW109_220302, 1302_QC100_220302, 1302_QC400_220302, 1302_QC500_220302, 1302_SW170_220302	**02-Mar-2022**	**11-Mar-2022**	29-Aug-2022	✓	**11-Mar-2022**	29-Aug-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW300_220302, 1302_SW109_220302, 1302_QC100_220302, 1302_QC400_220302, 1302_QC500_220302, 1302_SW170_220302	**02-Mar-2022**	**11-Mar-2022**	29-Aug-2022	✓	**11-Mar-2022**	29-Aug-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
1302_SW300_220302, 1302_SW109_220302, 1302_QC100_220302, 1302_QC400_220302, 1302_QC500_220302, 1302_SW170_220302	**02-Mar-2022**	**11-Mar-2022**	29-Aug-2022	✓	**11-Mar-2022**	29-Aug-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW300_220302, 1302_SW109_220302, 1302_QC100_220302, 1302_QC400_220302, 1302_QC500_220302, 1302_SW170_220302	**02-Mar-2022**	**11-Mar-2022**	29-Aug-2022	✓	**11-Mar-2022**	29-Aug-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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_SW300_220302, 1302_SW109_220302, 1302_QC100_220302, 1302_QC400_220302, 1302_QC500_220302, 1302_SW170_220302	**02-Mar-2022**	**11-Mar-2022**	29-Aug-2022	✓	**11-Mar-2022**	29-Aug-2022	✓

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	18	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	18	**0.00**	**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
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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2211499**	Page	: 1 of 7
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 05-Apr-2022 07:30
Order number	: 60612561 4.1	Date Analysis Commenced	: 05-Apr-2022
C-O-C number	: ----	Issue Date	: 11-Apr-2022 09:20
Sampler	: [redacted]		
Site	: ----		
Quote number	: SY/139/19 V3		
No. of samples received	: 7		
No. of samples analysed	: 7		

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*
[redacted]	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 Contact 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.
- 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: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW300_220401	1302_SW170_220401	1302_SW109_220401	1302_QC100_220401	1302_QC300_220401
				Sampling date / time	01-Apr-2022 09:35	01-Apr-2022 08:50	01-Apr-2022 10:00	01-Apr-2022 10:00	01-Apr-2022 09:55
					ES2211499-001	ES2211499-002	ES2211499-003	ES2211499-004	ES2211499-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.15**	<0.02	**0.03**	**0.03**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.13**	<0.02	**0.04**	**0.03**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.71**	**0.04**	**0.32**	**0.27**	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.04**	<0.02	**0.02**	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.75**	**0.11**	**0.53**	**0.52**	<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		**0.21**	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.52**	<0.02	**0.08**	**0.08**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.22**	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.24**	<0.01	**0.02**	**0.02**	<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: WATER (Matrix: WATER)				Sample ID	1302_SW300_220401	1302_SW170_220401	1302_SW109_220401	1302_QC100_220401	1302_QC300_220401
				Sampling date / time	01-Apr-2022 09:35	01-Apr-2022 08:50	01-Apr-2022 10:00	01-Apr-2022 10:00	01-Apr-2022 09:55
Compound	CAS Number	LOR	Unit		ES2211499-001	ES2211499-002	ES2211499-003	ES2211499-004	ES2211499-005
					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		**3.07**	**0.15**	**1.04**	**0.95**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.46**	**0.15**	**0.85**	**0.79**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**2.90**	**0.15**	**0.98**	**0.92**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**108**	**101**	**103**	**100**	**94.1**
13C8-PFOA	----	0.02	%		**108**	**103**	**99.4**	**102**	**94.9**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC400_220401	1302_QC500_220401	----	----	----
				Sampling date / time	01-Apr-2022 09:55	01-Apr-2022 06:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2211499-006	ES2211499-007	--------	--------	--------
					Result	Result	----	----	----
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	----	----	----
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	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC400_220401	1302_QC500_220401	----	----	----
				Sampling date / time	01-Apr-2022 09:55	01-Apr-2022 06:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2211499-006	ES2211499-007	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	----	----	----
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	%		**102**	**95.9**	----	----	----
13C8-PFOA	----	0.02	%		**105**	**105**	----	----	----

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2211499**	Page	: 1 of 4
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 05-Apr-2022
Order number	: 60612561 4.1	Date Analysis Commenced	: 05-Apr-2022
C-O-C number	: ----	Issue Date	: 11-Apr-2022
Sampler	: [redacted]		
Site	: ----		
Quote number	: SY/139/19 V3		
No. of samples received	: 7		
No. of samples analysed	: 7		

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*
[redacted]	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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4271506)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	94.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	91.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	89.6	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	97.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	91.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	91.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4271506)								
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	104	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	129	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	101	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	116	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	95.4	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	101	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	91.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	77.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	110	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4271506)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	93.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	135	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	107	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	76.3	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	123	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	95.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	90.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4271506)								
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	89.8	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	96.0	67.0	138

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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4271506) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	82.8	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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2211499**	Page	: 1 of 5
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 05-Apr-2022
Site	: ----	Issue Date	: 11-Apr-2022
Sampler	: [redacted]	No. of samples received	: 7
Order number	: 60612561 4.1	No. of samples analysed	: 7

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

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

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	0	10	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	10	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* Date extracted	Due for extraction	Evaluation	*Analysis* Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW300_220401, 1302_SW170_220401, 1302_SW109_220401, 1302_QC100_220401, 1302_QC300_220401, 1302_QC400_220401, 1302_QC500_220401	**01-Apr-2022**	**06-Apr-2022**	28-Sep-2022	✓	**07-Apr-2022**	28-Sep-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW300_220401, 1302_SW170_220401, 1302_SW109_220401, 1302_QC100_220401, 1302_QC300_220401, 1302_QC400_220401, 1302_QC500_220401	**01-Apr-2022**	**06-Apr-2022**	28-Sep-2022	✓	**07-Apr-2022**	28-Sep-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
1302_SW300_220401, 1302_SW170_220401, 1302_SW109_220401, 1302_QC100_220401, 1302_QC300_220401, 1302_QC400_220401, 1302_QC500_220401	**01-Apr-2022**	**06-Apr-2022**	28-Sep-2022	✓	**07-Apr-2022**	28-Sep-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW300_220401, 1302_SW170_220401, 1302_SW109_220401, 1302_QC100_220401, 1302_QC300_220401, 1302_QC400_220401, 1302_QC500_220401	**01-Apr-2022**	**06-Apr-2022**	28-Sep-2022	✓	**07-Apr-2022**	28-Sep-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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_SW300_220401, 1302_SW170_220401, 1302_SW109_220401, 1302_QC100_220401, 1302_QC300_220401, 1302_QC400_220401, 1302_QC500_220401	**01-Apr-2022**	**06-Apr-2022**	28-Sep-2022	✓	**07-Apr-2022**	28-Sep-2022	✓

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	10	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	10	**0.00**	**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
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.

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/220309/1 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	121	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	121	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	104	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	101	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	98	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	82	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	150	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	145	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	150	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	147	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	128	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	55	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	99	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	51	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	119	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	118	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	109	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	115	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	103	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	103	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	105	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	107	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	130	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	149	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	108	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	102	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	84	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	144	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	145	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	109	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	122	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	114	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	106	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference.

Signed: [redacted]

Organics Manager, NMI-North Ryde

Date: **16/03/2022**

REPORT OF ANALYSIS

Report No. RN1345719

Client	: AECOM AUSTRALIA PTY LTD	**Job No.**	: AECO06/220309/1
	[redacted]	**Quote No.**	: QT-02018
	[redacted]	**Order No.**	: 60612561_14_1
		Date Received	: 09-MAR-2022
Attention	: [redacted]	**Sampled By**	: CLIENT
Project Name	: NT_1302_PFASOMP		
Your Client Services Manager	: [redacted]	**Phone**	: 02 9449 0169

Lab Reg No.	Sample Ref	Sample Description
N22/004125	1302_QC200_220302	WATER 2/3/22 1149AM

Lab Reg No.		N22/004125				
Date Sampled		02-MAR-2022				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05				NR70
PFPeA (2706-90-3)	ug/L	<0.02				NR70
PFHxA (307-24-4)	ug/L	0.039				NR70
PFHpA (375-85-9)	ug/L	<0.01				NR70
PFOA (335-67-1)	ug/L	0.012				NR70
PFNA (375-95-1)	ug/L	<0.01				NR70
PFDA (335-76-2)	ug/L	<0.01				NR70
PFUdA (2058-94-8)	ug/L	<0.01				NR70
PFDoA (307-55-1)	ug/L	<0.01				NR70
PFTrDA (72629-94-8)	ug/L	<0.02				NR70
PFTeDA (376-06-7)	ug/L	<0.02				NR70
PFHxDA (67905-19-5)	ug/L	<0.02				NR70
PFODA (16517-11-6)	ug/L	<0.05				NR70
FOUEA (70887-84-2)	ug/L	<0.01				NR70
PFDS (335-77-3)	ug/L	<0.01				NR70
PFPeS (2706-91-4)	ug/L	0.023				NR70
PFHxS (355-46-4)	ug/L	0.19				NR70
PFHpS (375-92-8)	ug/L	<0.01				NR70
PFOS (1763-23-1)	ug/L	0.36				NR70
PFNS (68259-12-1)	ug/L	<0.01				NR70
PFBS (375-73-5)	ug/L	0.022				NR70
PFOSA (754-91-6)	ug/L	<0.01				NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02				NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02				NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01				NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01				NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05				NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05				NR70
4:2 FTS (757124-72-4)	ug/L	<0.01				NR70
6:2 FTS (27619-97-2)	ug/L	<0.01				NR70

REPORT OF ANALYSIS

Lab Reg No.		N22/004125				
Date Sampled		02-MAR-2022				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
8:2 FTS (39108-34-4)	ug/L	<0.01				NR70
10:2 FTS (120226-60-0)	ug/L	<0.01				NR70
8:2 diPAP (678-41-1)	ug/L	<0.02				NR70
PFBA (Surrogate Recovery)	%	107				NR70
PFPeA (Surrogate Recovery)	%	97				NR70
PFHxA (Surrogate Recovery)	%	102				NR70
PFHpA (Surrogate Recovery)	%	86				NR70
PFOA (Surrogate Recovery)	%	131				NR70
PFNA (Surrogate Recovery)	%	48				NR70
PFDA (Surrogate Recovery)	%	55				NR70
PFUdA (Surrogate Recovery)	%	51				NR70
PFDoA (Surrogate Recovery)	%	102				NR70
PFTeDA (Surrogate Recovery)	%	57				NR70
PFHxDA (Surrogate Recovery)	%	19				NR70
FOUEA (Surrogate Recovery)	%	72				NR70
PFBS (Surrogate Recovery)	%	106				NR70
PFHxS (Surrogate Recovery)	%	112				NR70
PFOS (Surrogate Recovery)	%	110				NR70
PFOSA (Surrogate Recovery)	%	56				NR70
N-MeFOSA (Surrogate Recovery)	%	78				NR70
N-EtFOSA (Surrogate Recovery)	%	66				NR70
N-MeFOSAA (Surrogate Recovery)	%	58				NR70
N-EtFOSAA (Surrogate Recovery)	%	59				NR70
N-MeFOSE (Surrogate Recovery)	%	20				NR70
N-EtFOSE (Surrogate Recovery)	%	161				NR70
4:2 FTS (Surrogate Recovery)	%	116				NR70
6:2 FTS (Surrogate Recovery)	%	99				NR70
8:2 FTS (Surrogate Recovery)	%	64				NR70
8:2 diPAP (Surrogate Recovery)	%	51				NR70
Dates						
Date extracted		14-MAR-2022				
Date analysed		14-MAR-2022				

N22/004125
PFOS and PFHxS are quantified using a combined branched and linear standard,
linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

Selected PFAS surrogate recoveries are biased due to matrix effects.

REPORT OF ANALYSIS

High PFAS surrogate recoveries accepted - results corrected for recovery.
Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N >10.

[redacted]

Organics - NSW
Accreditation No. 198

16-MAR-2022

NATA
ACCREDITED FOR
TECHNICAL
COMPETENCE

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1345693*

Measurement Uncertainty is available upon request.
Chemical Accreditation 198: 105 Delhi Road, North Ryde, NSW, 2113

Appendix G

Calibration Certificates

AECOM Imagine it. Delivered.

[redacted]

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Equipment Information

Instrument:

Serial Number: 19G102636

Equipment Check

	Enclosed	Comment
YSI Pro Plus Display	☑	
YSI Quatro Sonde	☑	
- YSI 1001 pH Probe	☑	
- YSI 1002 ORP Probe	☑	
- YSI 5560 Cond/Temp Probe	☑	
- YSI Polarographic DO Sensor	☑	
Flow Cell & Attachments (x2)	☑	
Probe Guard	☑	
Rubber Storage/Calibration Sleeve	☑	
Calibration Cup + Cap	☑	
YSI Cable Management Kit	☑	
YSI Pro Series ProComm II Kit	☑	
User Manual + Flow Cell Manual	☑	
Spare Batteries (x2) & Screwdriver	☒	REPLENISH TOOLKIT.
Laminated Quick Start Guide	☑	

Sensor Calibration Details

	Calibration Undertaken	Accuracy	Pass	Fail
Temperature	Factory Calibrated	±0.2°C	☑	☐
Dissolved Oxygen	☑ 100% Saturation	±2%	☑	☐
	Pressure Compensation ____hPa		☑	☐
Conductivity	☑ 12.88mS/cm 13.20	±0.5%	☐	☐
	☑ Check linearity at 1.413mS/cm 1430	±0.5%	☑	☐
Salinity	Auto Calibrated	±1%	☐	☐
pH	☑ pH 7.00 6.87 ↑	± 0.2	☑	☐
	☑ pH 4 4.67	± 0.2	☐	☑ CALIBRATED TO 4.01
	☑ pH 10 9.80↑		☑	
ORP	☐ 229.4 mV at 22.8 °C	±20mV	☑	☐

SLOW TO ADJ.

This is to certify that where possible, this instrument has been calibrated in accordance with the manufacturer's calibration procedure as recommended in the instrument service manual.

Name: [redacted]

Signature:

Date: 10/1/22

YSI
19A102636

BUMP TEST 14/1/22

~~pH EC ORP~~

7:10AM

pH 7	pH 4	pH 10	ORP	EC 1413 µs/s	EC 12.8
7.00	4.98 (RE-CAL) ON SITE	9.80	233.5 @ 25.22	1410 µs/s	12.89

YSI B.T. 17/1/22

pH 7	pH 4	pH 10	ORP	EC 1413	EC 12.88
7.15	5.04 RECAL	9.80	239.1 @ 16.8°	1407	12.693

TURBIDITY (SONTEK) 191

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMP WQMP	**Project Number:**	[redacted]
Project Location:	RAAF Darwin	**Client:**	DoD Ventia
PM Name:	[redacted]	**Fieldwork Staff Name:**	[redacted]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	YSI	WP88 TURBIDITY
Make and Model:	Pro Plus.	
Serial Number:	17CE03095	

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	14/3/22 1150A.											
Parameter	Acidity			Conductivity				TURB.	Dissolved Oxygen		ORP	
Units	pH	pH		~~mS~~ µS/cm	mS			NTU	~~ppm~~	~~ppm~~	~~ppm~~	mV
Calibration Standard Concentration:	4	7	10	12.88	1413			180			-	
Calibration Reading:	4.57*	6.96	9.52*	10.6*	1620*						227.7	
Calibration Temperature:	←										@ 26.4	

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	15/3/22 0940											
Parameter	Acidity			Conductivity					Dissolved Oxygen		ORP	
Units	pH	pH		~~mS~~ µS/cm	mS				~~ppm~~	~~ppm~~	~~ppm~~	mV
Calibration Standard Concentration:	4	7	10	12.88	1413							
Bump Test Reading:	4.42*	7	9.62*	11.77*	1410						220.4	
Bump Test Temperature:	←										@ 29.8°C	

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

*=9.99 CAL TO SOL. STANDARD VALUE
" "
* 4.01
" "
* 12.88 mS
* 1413 µS
"

Approval and Distribution

☐ Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

[redacted] Date

Distribution: Project Central File

AECOM

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	PFAS OMP WQMP	**Project Number:**	60612561 60675399
Project Location:	RAAF Darwin	**Client:**	DoD Ventia
PM Name:	[redacted]	**Fieldwork Staff Name:**	[redacted]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	YSI (XYLEM)
Make and Model:	Pro DSS.
Serial Number:	17C103095

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	0830 16/3/22				
Parameter	Acidity		Conductivity	Dissolved Oxygen ~~Dissolved Oxygen~~ ORP	
Units	pH	pH	µS/cm	~~ppm~~	ppm
Calibration Standard Concentration:	4 | 7	10	12.88 | 1413 µ		
Calibration Reading:	4.02 | 7	9.55*	12.26 2000		216.4
Calibration Temperature:					31.6 °C

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:					
Bump Test Reading:					
Bump Test Temperature:					

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

* CAL TO SOLUTION VALUE

Approval and Distribution

☐ Each individu[redacted]sted as required by fieldwork staff.

Date

Distribution: Pr[redacted]

YSI CAL SHEET 7/3/22 BS

Serial number: 17CE03095

pH 7	pH 10	pH 4	ORP	EC 12.88	EC 1413
6.91	9,39	4.3 .89	227.0 @28.7°C	12.886	1513/CAL TO 1413.

YSI CAL SHEET 8/3/22

pH 7	pH 10	pH 4	ORP	EC 12.88	EC 1413
7.00	9.58 CAL.	3.97	220.0 31.2	13.4 OL. CAL.	1590 CAL

YSI CAL SHEET 8/3/22

pH 7	pH 10	pH 4	ORP	EC 12.88 mS	EC 1413 µS
7.30 CAL TO 6.98	9.68 CAL TO 10.01	3.98	216.3 @32.1	13.119 CAL TO 12.88	1505 CAL TO 1413.

YSI CAL SHEET 10/3/22 0650a

pH 7	pH 10	pH 4	ORP	EC 12.88 mS	EC 1413 µS
7.38* 6.98	9.60* 9.82 10.0	4.42* 4.02	217.1 @32.7	12.03* 12.88	1554* 1413

AECOM

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	WQMP / PFAS OMP	**Project Number:**	60675399 / 60612581
Project Location:	RAAF DARWIN	**Client:**	[redacted]
PM Name:	[redacted]	**Fieldwork Staff Name:**	[redacted]

This calibration record is intended to prompt fieldwork staff to calibrate water quality meter (WQM) daily before the start of fieldworks.

INSTRUMENT DETAILS

Supplier:	YSI
Make and Model:	Pro PLUS.
Serial Number:	17CE03095

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	9/3/22 . 0815A					
Parameter	Acidity			Conductivity		Dissolved Oxygen ORP
Units	pH		pH	µS/cm mS/cm		ppm ppm
Calibration Standard Concentration:	4	7	10	1413	12.88	
Calibration Reading:	3.98	7.30*	9.61 *	1505*	13.12*	216.3
Calibration Temperature:	←					@32.1

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	10/3/22 0650					
Parameter	Acidity			Conductivity 12.88		Dissolved Oxygen ORP
Units	pH		pH	1413 µS/cm mS/c		ppm ppm
Calibration Standard Concentration:	4	10	4	1413	12.88	
Bump Test Reading:	7.38*	9.60*	4.42 *	1554*	12.05*	@21.1°C
Bump Test Temperature:	←					32.7

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

* CAL TO STD SOLUTION VALUE.

Approval and Distribution

[redacted] d daily and bump tested as require[redacted]

Distribution: Project Central File

Prepared for
Department of Defence, Directorate of PFAS Remediation, Environment and Engineering Branch
ABN: 68706814312

AECOM

2022 Dry Season Sampling Event Factual Report

PFAS OMP - RAAF Base Darwin

15-May-2023
RAAF Base Darwin

Art by
Bianca Gardiner Dodd

aecom.com

Delivering a better world

Delivering a better world

2022 Dry Season Sampling Event Factual Report

PFAS OMP - RAAF Base Darwin

Client: Department of Defence, Directorate of PFAS Remediation, Environment and Engineering Branch

ABN: 68706814312

Prepared by

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15-May-2023

Job No.: 60612561

Quality Information

Document	2022 Dry Season Sampling Event Factual Report PFAS OMP - RAAF Base Darwin
Ref	60612561
Date	15-May-2023
Prepared by	Spencer Fynn
Reviewed by	David Steele

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
0	15 May 2023	Final	James Guzman Project Manager	

Table of Contents

List of Tables (in Text)

Abbreviations

Abbreviation	Term
AECOM	AECOM Australia Pty Ltd
ALS	ALS Environmental Pty Ltd
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999
BOM	Bureau of Meteorology
DCMM	Defence Contamination Management Manual
Defence	Department of Defence
DO	Dissolved Oxygen
DoH	Department of Health
DIA	Darwin International Airport
DQOs/DQIs	Data Quality Objectives/Data Quality Indicators
EC	Electrical Conductivity
HEPA	Heads of Environment Protection Authority
LOR	Limit of Reporting
LNAPL	Light Non-Aqueous Phase Liquid
MW	Monitoring Well
NATA	National Association of Testing Authorities
NEMP 2.0	National Environmental Management Plan
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
NSW	New South Wales
OMP	Ongoing Monitoring Plan
ORP	Oxidation Reduction Potential
PFAS	Per- and poly-fluoroalkyl substances
PFHxS	Perfluorohexanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PFDS	Perfluorodecanesulfonic acid
PFUnDA	Perfluoroundecanoic acid
PFDoDA	Perfluorododecanoic acid

Abbreviation	Term
PFTrDA	Perfluorotridecanoic acid
PFTeDA	Perfluorotetradecanoic acid
MeFOSA	N-Methyl perfluorooctane sulfonamide
EtFOSA	N-Ethyl perfluorooctane sulfonamide
MeFOSE	N-Methyl perfluorooctane sulfonamidoethanol
EtFOSE	N-Ethyl perfluorooctane sulfonamidoethanol
MFOSAA	N-Methyl perfluorooctane sulfonamidoacetic acid
EtFOSAA	N-Ethyl perfluorooctane sulfonamidoacetic acid
4:2 FTS	4:2 Fluorotelomer sulfonic acid
10:2 FTS	10:2 Fluorotelomer sulfonic acid
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance and Quality Control
RAAF	Royal Australian Air Force
SAQP	Sampling and Analysis Quality Plan
SW	Surface Water

List of Units

Unit	Definition	Unit	Definition
°C	Degrees Celsius	mg	Miligrams
cm	Centimetre	mV	Millivolts
L	Litre	µg	Micrograms
m	Metre	µS	Microsiemens
mAHD	meters Australian Height Datum	NTU	Nephelometric Turbidity Unit
mbtoc	metres below top of casing	mbgl	Metres below ground level

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing monitoring plan (OMP) outlined in the *PFAS Management Area Plan (PMAP)* (Department of Defence, 2019a) at The Royal Australian Air Force (RAAF) Base Darwin (the 'Site') in the Northern Territory. The location of the Site and Management Area is shown in **Figure 1** in **Appendix A**. The OMP (Department of Defence, 2019a) for the Site outlines the requirement to complete annual biota sampling and biannual groundwater and surface water sampling.

The primary purpose of the OMP is to monitor changes to the PFAS impact in groundwater and surface water pathways associated with sources of PFAS as initially assessed through the detailed site investigation phase of works. Changes may result from the specific or cumulative impact of remediation or containment actions, existing transportation trends, and changes to hydrogeology or weather events.

The monitoring program at RAAF Base Darwin includes a regime of groundwater, surface water and biota sampling to capture these changes in the long term, to enable Defence to maintain an up-to-date understanding of temporal and spatial distribution, concentration, and transport of PFAS contaminants.

1.2 Objectives

The objective of the OMP is to provide information on changes to PFAS contamination originating from Defence property to inform risk management decisions by Defence and Territory agencies to protect human health and the environment. As part of the ongoing management of PFAS at the Base, Defence needs to understand and monitor PFAS conditions at source areas, PFAS mass-flux at the base boundary, and track PFAS as it moves to locations downgradient of the Base.

The purpose of this PFAS OMP factual report is to summarise the scope of works and findings for the mid-dry season surface water sampling and the biannual end of dry season groundwater sampling conducted in accordance with the Sampling and Analysis Quality Plan (SAQP) (AECOM, 2021).

This report has been prepared in accordance with the *PFAS OMP Factual Report Guidance,* v0.2, May 2021 (Department of Defence, 2021b).

An annual interpretive report will be subsequently developed for the purpose of assessing the data collected during the discrete monitoring events completed over the preceding 12-month period (June 2022 through May 2023) and will include assessment of environmental variability and any statistically significant trends in PFAS concentrations.

2.0 Scope of work

The groundwater and surface water sampling events were completed in general accordance with the SAQP (AECOM, 2021); see Section 2.2 for deviations from the SAQP.

Prior to commencement of the sampling events, the SAQP (AECOM, 2021) was reviewed to ensure compliance with the following:

- The OMP (Department of Defence, 2019a)
- PFAS National Environmental Management Plan (NEMP 2.0) (HEPA, 2020)
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (ASC NEPM, 2013)
- Defence Routine Environment Water Quality Monitoring Manual (Department of Defence, 2019b)
- AS/NZ 5667:1998 Water quality – Sampling (AS/NZS, 1998)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018)
- Relevant Territory regulatory guidelines.

In summary, the scope of works for this sampling event, conducted in June, August and September 2022, included:

- June 2022
  - Mid-dry season collection of a surface water sample from one location for the Base-wide PFAS mass flux PFAS Investigation (refer to **Appendix A – Figure 4** for specific location).
- August 2022
  - Mid-dry season collection of a surface water sample from one location for the Base-wide PFAS mass flux PFAS Investigation (refer to **Appendix A** – **Figure 4** for specific location).
- September to October 2022:
  - Gauging of groundwater levels at 30 of 34 planned monitoring wells and collection of groundwater samples (using Hydrasleeves™) from 29 of 34 planned monitoring wells (refer to **Table 1** below, and **Figure 2 in Appendix A** for specific locations). It is noted that five monitoring wells could not be sampled during this sampling event as four gauged dry and one HydraSleeve™ was damaged on retrieval; refer to Error! Reference source not found. for more details.
  - A sample was incorrectly collected from a non-OMP well and labelled MW133 during the initial sampling round in September. This error was not discovered until after the sampling results were reviewed. Once confirmed that the wrong location was sampled field staff remobilised in October to collect from the correct location.
  - During the initial sampling round in September samples for monitoring wells MW112 and MW128 did not reach the laboratory as the lids were not fastened correctly. Once confirmed field staff remobilised in October to resample both locations.
- Overall:
  - Collection of intra- and inter-laboratory duplicate samples at a rate of 1 in 10 primary samples, one rinsate and one field blank sample per fieldwork day for groundwater.
  - Analysis of groundwater samples for a suite of 28 PFAS analytes at the standard limit of reporting (LOR).
  - Data management of the OMP field and laboratory data in the Defence ESdat database.
  - Preparation of this Sampling Event Factual Report.

2.1 Planned monitoring locations

Defence notified the AECOM project management team with the recommendation to add four new monitoring wells to the OMP (Coffey, 2019a) scope of work to address identified data gaps and recommendations from previous sampling rounds. The proposed wells will be sampled biannually, at the end of the wet season (March) and the end of the dry season (Oct - Dec) and are outlined in **Table 1**.

The monitoring locations outlined within the SAQP (AECOM, 2021) for the groundwater sampling event are outlined in **Table 1**below:

Table 1 Groundwater sampling locations, requirements, and additional requirements

Area	Description	Sampling locations	Number of wells/bores	Total
On site	Former Fuel Farm 1	MW215	1	18 locations
	Former Fuel Farm 5	MW297, MW112	2	
	Former Fuel farms	MW303, MW133, MW205	3	
	Former Fire Training Area 1	MW422*, MW139	2	
	Current Fire Training Area	MW240**, MW241**	2	
	RAAF Fire Station	MW103	1	
	Former ARFF Fire Station	MW115	1	
	Source area downgradient transect	MW107, MW128	2	
	Southern boundary of site	MW141, MW144	2	
	Western boundary of site	MW148	1	
	Rapid Creek – Eastern end	MW156	1	
Off site	Former Fire Training Area 2, Darwin International Airport (DIA)	MW197**	1	12 locations
	Off-Base (north)	MW185	1	
	Rapid Creek	MW190, MW191, MW194, MW195	4	
	Off-Base (south)	MW176, MW180, MW200, MW209	4	
	Off-Base (southwest)	MW211	1	
	Off-Base (west)	MW210	1	

Area	Description	Sampling locations	Number of wells/bores	Total
Additional sites: on-base	Western boundary of site	MW451, MW452	2	4 locations
	Current Fire Training Area	MW453**	1	
	Former Fire Training Area 1	MW454	1	

* Contingency location MW235 sampled in lieu of MW422 due to no access.

** Wells gauged dry and were not sampled.

The monitoring locations outlined within the SAQP (AECOM, 2021) for the surface water sampling events are outlined in **Table 2** below:

Table 2 Base- wide PFAS mass flux mid-dry season surface water location completed in June and August 2022

Area	Description	Sampling locations	Number of locations	Total
Off-Base	Rapid Creek	SW109	1	1 Location

2.2 Deviations from the SAQP

The works completed during this sampling event included some deviations from the SAQP (AECOM, 2021) as outlined below in **Table 3**Error! Reference source not found..

Table 3 Deviations from the SAQP during sampling events for June, August, and September 2022

SAQP	June, August, and September sampling event	Impact on OMP
Sampling of monitoring locations MW451, MW452, MW453 and MW454	Defence notified the AECOM project management team on 22 January 2022 with the direction to add four new monitoring wells to the OMP (Coffey, 2019a) scope of work to address identified data gaps and recommendations from previous sampling rounds. The proposed wells will be sampled biannually, at the end of the wet season (March) and the end of the dry season (Oct - Dec).	Increased data range to inform PFAS mass flux at the Base boundary.
Proposed annual schedule for sampling and reporting	During the September sampling event, groundwater wells MW453, MW240, MW241, and MW197 were gauged dry and therefore unable to be sampled.	Loss of Data.
Proposed annual schedule for sampling and reporting	During the September sampling event the sampling of GW well MW115 was not achieved due to the HydraSleeve™ tearing and losing sample on retrieval. Additional attempts made to sample MW115 resulted in the HydraSleeve™ tearing during each attempt. The well may need to be investigated to determine the cause.	Loss of Data.
Proposed annual schedule for sampling and reporting	Monitoring wells MW112, MW128 and MW133 were sampled in October.	No impact on the OMP.

SAQP	June, August, and September sampling event	Impact on OMP
Collection of surface water parameters in-situ	Surface water parameters were collected by filling a clean collection container with water from the surface water collection location and immediately placing the probe within the container to collect the recorded parameters after stabilisation is achieved.	No impact on the OMP as the parameter results are anticipated to be the same whether collected in-situ or ex-situ.

3.0 Sampling methodology

3.1 Groundwater and surface water

The methodology adopted for the sampling events between June and October (where applicable) were in accordance with the SAQP (AECOM, 2021) and is summarised below in **Table 4**

Table 4 Sampling methodology

Item	Details
Groundwater and surface water	
Groundwater sampling methodology	
Groundwater gauging	The depth to groundwater was measured in each monitoring well immediately prior to deploying the HydraSleeve™ using an interface probe.
Field parameters	Where appropriate, groundwater field parameters were recorded ex-situ, using a daily calibrated YSI Pro Water Quality Meter (refer to **Appendix G** for calibration certificate). Parameters recorded consisted of the following: temperature (°C), electrical conductivity (EC), dissolved oxygen (DO), oxidation-reduction potential (ORP) and pH. Observations of odour, colour and clarity (turbidity) of groundwater were recorded at each site.
Sampling methodology	Groundwater samples were collected from all accessible wells using no-purge methodology HydraSleeves™.All HydraSleeves™ were installed within the screened interval of the well 1 metre below the standing water level for a minimum of 24 hours prior to sampling as stated in the SAQP (AECOM, 2021).
Quality Assurance/ Quality Control (QA/QC) samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits) and rinsate samples. Refer to **Appendix D** for assessment of QA/QC sample data.
Sample analysis	Samples were submitted to the primary and secondary laboratories for analysis detailed in **Section 4.2.2.** ALS Environmental Pty Ltd (ALS) Sydney, New South Wales (NSW) was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for analyses were certified by the National Association of Testing Authorities (NATA). Chain of custody and laboratory certificates are presented in **Appendix E** and **Appendix F**, respectively.
Surface water sampling methodology	
Field parameters	Where appropriate, field parameters were recorded ex-situ using a calibrated YSI Pro water quality meter (refer to **Appendix G** for calibration certificate). Parameters recorded consisted of the following: temperature, EC, DO, redox potential and pH. Observations of odour, colour and clarity (turbidity) of surface water were recorded at each site.
Sampling methodology	Surface water samples were collected from approximately 0.1 metres below the water surface to minimise collection of sediment or floating materials in the samples. At each location, a new, laboratory supplied container was lowered into the water, using an aluminium sampling pole, with the cap immediately applied once the container was full.

Item	Details
Groundwater and surface water	
QA/QC samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples, rinsate, field blank and trip blank samples. Refer to validation report for the results (**Appendix D**).
Sample analysis	ALS Sydney, NSW was used as the primary laboratory. NMI of Sydney, NSW and/or ALS Brisbane, QLD was used as the secondary laboratory. ALS and NMI methods for analyses were certified by the National Association of Testing Authorities. Chain of custody and laboratory certificates are presented in **Appendix E** and **Appendix F**, respectively.

3.2 Adopted screening criteria

Screening criteria were selected on the basis of national guidance in the form of the PFAS National Environmental Management Plan, Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset includes the following:

- Department of Health (DoH), 2019. Health based guidance values for PFAS for use in site investigations in Australia. April 2017 (as amended 2019) (Department of Health, 2019).
- Heads of the Environment Protection Authority (HEPA), 2020. PFAS National Environmental Management Plan (NEMP 2.0). (HEPA, 2020).
- National Health and Medical Research Council (NHMRC), 2019. Guidance on Per and Polyfluoroalkyl (PFAS) in Recreational Water (NHMRC, 2019).

The adopted screening criteria which have been adopted for groundwater and surface water are presented **Table 5**.

Table 5 Summary of adopted screening criteria for groundwater and surface water

Pathway	Compound	Criteria	Comment/Reference
Human health receptors			
Drinking water - groundwater	PFOS + PFHxS	0.07 µg/L	These values are from the PFAS NEMP 2.0 (HEPA, 2020). *All groundwater results will be compared to these criteria.*
	PFOA	0.56 µg/L	
Recreational use – surface water	PFOS + PFHxS	2 µg/L	The values presented in the PFAS NEMP 2.0 (HEPA, 2020) are from the Guidance on PFAS in Recreational Water (NHMRC, 2019) guidance on the assessment of PFAS in recreational water released in August 2019. *All surface water and groundwater results will be compared to these criteria.*
	PFOA	10 µg/L	
Ecological receptors			
Freshwater (99% species protection values)	PFOS	0.00023 µg/L	These values are from the PFAS NEMP 2.0 (HEPA, 2020). The 99% level of protection has been applied for slightly to moderately disturbed ecosystems. This approach is generally adopted for chemicals that bioaccumulate and biomagnify in wildlife. For the purposes of preliminary screening of analytical water results, the laboratory LOR will be adopted rather than sole use of the criteria value. *All surface water and groundwater results will be compared to these criteria.*
	PFOA	19 µg/L	

3.3 Data quality objectives and data validation

The data quality objectives (DQOs) and data quality indicators (DQIs) adopted for these works are presented in the SAQP (AECOM, 2021).

Data validation assessment is provided in **Appendix D**.

Data validation procedures employed in the assessment of the field and laboratory QA/QC data are indicative that the overall quality of the analytical data produced is acceptably reliable for the purpose of this report.

All data collected during this event has been reviewed and uploaded to the Defence ESdat database in accordance with Defence Contamination Management Manual (DCMM) (Department of Defence, 2021a) Annex L requirements.

The analytical data can be used as a basis for interpretation subject to the limitations outlined below:

- Elevated RPDs should be taken into consideration when using data for PFOS, PFHxS, PFOA and Sum of PFHxS & PFOS close to guidelines. quantitatively and when interpreting data for sum of PFOS, PFHxS PFOA and Sum of PFHxS and PFOS close to guidelines from primary batches ES2230718, ES2235227 and ES2236478.
- The potential exists for concentrations of PFOS to be below the LOR, but above the guideline in samples MW209 and should be taken into consideration when interpreting results.
- The potential exists for concentrations of Perfluorodecanesulfonic acid (PFDS), Perfluoroundecanoic acid (PFUnDA), Perfluorododecanoic acid (PFDoDA), Perfluorotridecanoic acid (PFTrDA), Perfluorotetradecanoic acid (PFTeDA), N-Methyl perfluorooctane sulfonamide (MeFOSA), N-Ethyl perfluorooctane sulfonamide (EtFOSA), N-Methyl perfluorooctane

sulfonamidoethanol (MeFOSE), N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE), N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA), N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA), 4:2 Fluorotelomer sulfonic acid (4:2 FTS), 10:2 Fluorotelomer sulfonic acid (10:2 FTS) to be biased low, this potential for under reporting should be taken into consideration when using results quantitatively.

4.0 Field observations and results

4.1 General field observations

The following field observations were applicable across RAAF Base Darwin during sampling events and is provided in **Appendix B**.

Table 6 General field observations

Item	Observation
Weather conditions	Weather for the 30 June 2022 surface water sampling event was observed to be partly cloudy, cool, and slightly humid. Temperature ranged from 20.3°C min to 26.4°C max, and medium to high relative humidity from 54 percent – 73 percent. 4.8 mm of precipitation was recorded on the day (Darwin Airport weather station, 014015) (BOM, 2022). Climate conditions were within normal ranges for the time of year sampling occurred and are not expected to have material impact sampling analysis results.
	Weather for the 26 August 2022 surface water sampling event was observed to be partly cloudy, warm, and dry. Temperature ranged from 18.3°C min to 33.3°C max, and medium to low relative humidity from 26.6 percent – 25 percent. No precipitation was recorded on 26 June 2022 (Darwin Airport weather station, 014015) (BOM, 2022). Climate conditions were within normal ranges for the time of year sampling occurred and are not expected to have material impact sampling analysis results.
	Weather for the groundwater sampling event was observed to be partly cloudy, hot, and humid. Temperature ranged from 32.0°C to 35.3°C, and medium to high relative humidity from 46 percent – 69 percent. 2.4 mm and 9.6 mm of precipitation was recorded on 26 and 29 September respectively and no precipitation recorded on 27 and 28 September 2022. (Darwin Airport weather station, 014015) (BOM, 2022). Early rain events occurred prior to and during the groundwater sampling event, however, conditions are not expected to have a material impact on sampling analysis results.
Estate management works or training activities	During the sampling event, no notable estate works, or training activities were observed in the vicinity of sampling locations with the exception of the following: • Airforce flying associated training activities were being undertaken. This did not detrimentally interfere with the sampling program; however, minor delays were presented. • Fencing and earth moving activities associated with the PFAS Soil Remediation Action Plan (RAP) works at Former Fire Training Ground 1, which prevented access to the well during the sampling event.

4.2 Groundwater results

4.2.1 Field observations and field measurements

Table 7 Groundwater observations and field measurements

Item	Observations and field measurements
Fieldwork dates	The groundwater sampling was completed between September and October 2022.
Access and sample collection	All monitoring wells and bores were accessible and able to be sampled with the exception of the following: • Monitoring well MW422 was not sampled due to a construction site fence blocking access to the well. The identified contingency well (MW235) was sampled in lieu • Monitoring well MW240 was dry • Monitoring well MW241 was dry • Monitoring well MW453 was dry • Monitoring well MW197 was dry • Monitoring well MW115 could not be sampled as HydraSleeve samplers ripped on attempted recovery • Monitoring well MW141 did not recover enough water to measure parameters It should be noted that MW240, MW241 and MW453 did not have identified contingency locations available. It should be noted that MW197 contingency well MW236 was also dry.
Monitoring well network condition	The monitoring well network was generally in good condition, however MW115 will need to be checked to determine why HydraSleeves™ are becoming damaged upon retrieval.
Field observations	Monitoring wells MW303 and MW297 located near the fuel tank farms on Bombing Road were observed to emit a hydrocarbon odour. Notably, MW297 had a 10mm thickness light non-aqueous phase liquid (LNAPL) layer.
Depth to groundwater and flow direction	Depth to groundwater was recorded from 30 of 34 wells visited, ranging from 1.97 (MW190) to 13.15 (MW133) metres below top of casing (mbtoc). Groundwater elevations in the aquifer were between 2.58 (MW185) and 22.17 (MW115) metres Australian Height Datum (mAHD). Groundwater gauging data is presented in **Table T1** in **Appendix B**. Inferred groundwater contours and groundwater flow directions at the Site in September 2022 are shown on **Figure 3** in **Appendix A**. A localised high point is located in the centre of the Base, south of the runway, with the groundwater flow radiating from this location. Groundwater in the north and west portions of the Base is inferred to generally flow northwest towards the coast, with localised flow towards Ludmilla Creek on the western boundary of the Base and Rapid Creek north of the Base. Groundwater to the south of the site is inferred to flow towards Charles Darwin National Park and Francis Bay. Groundwater contours are generally consistent with the Detailed Site Investigation (Coffey, 2018) flow direction.

Item	Observations and field measurements
Geochemical parameters	Groundwater geochemical parameters was measured during sample collection from the HydraSleeve™ using a sterilised YSI cup and YSI Pro Water Quality Meter. The readings are presented in **Table T1** in **Appendix B**, and YSI calibration certificate in **Appendix G,** and are summarised below: • DO ranged from 0.53 mg/L (MW297) to 2.50 mg/L (MW210) indicating hypoxic conditions. • EC ranged from 33.5 µS/cm (MW194) to 1451.00 µS/cm (MW209). The majority of readings were below 100 µS/cm indicating generally low salinity, with higher salinity generally at lower groundwater elevations around the perimeter of the monitoring network. • pH ranged from 4.09 (MW128) to 7.09 (MW133) indicating acidic to neutral conditions. • ORP (corrected) ranged from -34.5 mV (MW303) to 215.2 mV (MW128) indicating reducing conditions.

4.2.2 PFAS groundwater analytical results

During this sampling event, 28 of the 29 groundwater locations sampled (all other than MW209) reported concentrations of PFAS above the laboratory LOR.

There were no new exceedances at any of the sampled groundwater monitoring locations.

The PFAS groundwater analytical results from the September- October 2022 sampling event are presented in **Table T2** in **Appendix B.**

Table 8 First-time detections of PFAS and new exceedances of guidelines in groundwater

Type	Location ID	Sum of PFHxS+PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFOS concentration (µg/L)	
		September 2022	Historical maximum	September 2022	Historical maximum	September 2022	Historical maximum
First-time detections of Sum of PFHxS+PFOS, PFOS or PFOA in groundwater	There were no first-time detections of PFHxS+PFOS, PFOS or PFOA during this sampling event.						
Newexceedance of human health criteria for sum of PFHxS+PFOS or PFOA in groundwater	There were no new exceedances of human health criteria for sum of PFHxS+PFOS or PFOA in groundwater during this sampling event.						
Newexceedance of ecological criteria for PFOS or PFOA in groundwater	There were no new exceedances of ecological criteria for PFOS or PFOA in groundwater during this sampling event.						

4.3 Surface water – June & August events

4.3.1 Field observations and field measurements

Table 9 Surface water observations and field measurements for SW109

Item	Observations and field measurements
Fieldwork dates	The surface water samples, and field parameters were collected on 30 June and 26 August 2022.
Access and sample collection	During both events the surface water location was accessible and able to be sampled.
Field observations	Rapid creek system had low flows with low turbidity.
Rainfall	5.2 mm of rainfall was reported for the Darwin Area (Darwin Airport weather station, 014015) during the month of June and 4.8 mm fell on the first day of sampling (30 June 2022) and no rain was recorded during the month of August (Bureau of Meteorology, 2022).
Surface water flow	Surface water flow was low in the Rapid Creek system.
Geochemical parameters	Surface water quality parameters for monitoring location SW109 were measured after the collection of surface water samples in June and August. The stabilised readings are presented in **Table T4** in **Appendix B**, and are summarised below: • DO ranged from 2.78 mg/L (August 2022) to 3.65 mg/L (June 2022) indicating hypoxic to low oxygenated conditions. • EC ranged from 180.2 µS/cm June 2022) to 431.0 µS/cm (August 2022) indicating generally low salinity. • pH ranged from 5.12 (August 2022) to 5.86 (June 2022) indicating mildly acidic conditions. • Redox (corrected) ranged from -7.3 mV (June 2022) to 272.2 mV (August 2022) indicating low reducing to oxidising conditions.

4.3.2 PFAS surface water analytical results

Both the June and August 2022 samples from SW109 reported PFAS concentrations above the laboratory LOR.

There were no new exceedances reported at SW109 for both June and August 2022 sampling events.

The PFAS surface water analytical results from the June and August 2022 sampling events are presented in **Table T5** in **Appendix B.**

Table 10 First-time detection of PFAS and new exceedances of guidelines in surface water (June and August)

Type	Location ID	Sum of PFHxS+PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFOS concentration (µg/L)	
		June and August 2022	Historical maximum	June and August 2022	Historical maximum	June and August 2022	Historical maximum
First-time detections of Sum of PFHxS+PFOS, PFOS or PFOA in surface water	There were no first-time detections of PFHxS+PFOS, PFOS or PFOA during these sampling events.						
Newexceedance of human health criteria for sum of PFHxS+PFOS or PFOA in surface water	There were no first-time detections of PFHxS+PFOS, PFOS or PFOA during these sampling events.						
Newexceedance of ecological criteria for PFOS or PFOA in surface water	There were no new exceedances of ecological criteria for PFOS or PFOA in surface water during these sampling events.						

5.0 Summary and next sampling events

5.1 Summary of monitoring event

The mid-dry season collection of surface water samples for the Base-wide PFAS mass flux Investigation was completed on 30 June and 26 August 2022. The program included sampling of surface water from one planned location (SW109) over two separate events

The bi-annual groundwater monitoring event was completed at the Site and publicly accessible land within the Management Area between 26 September and 19 October 2022. The program included sampling of groundwater from 29 of a planned 34 monitoring wells. Monitoring wells MW240, MW241, MW197, and MW453 presented as dry. Contingency location MW235 was sampled in lieu of MW422 which was found to be inaccessible due construction activities. MW115 was not sampled due to HydraSleeve™ becoming damaged during the retrieval process.

The findings of the June and August 2022 surface water sampling events and the recommended actions are summarised in **Table 11** below.

Table 11 Summary of surface water sampling events

Item	Comment	Recommended actions
Access to sampling locations	The proposed monitoring location was accessible.	No actions recommended.
Analytical Results	PFAS concentrations were recorded above the LOR for the two samples collected during two events at the same monitoring location.	Ongoing monitoring in accordance with Base-wide PFAS mass flux OMP.
New exceedance of PFAS NEMP 2.0 drinking water or recreational guideline values in surface water	No locations reported first-time detections.	No actions recommended.
First-time detection of PFAS in surface water	No locations reported first-time detections.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show an increasing trend in surface water	This will be evaluated in the annual interpretive report.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show a decreasing trend in surface water	This will be evaluated in the annual interpretive report.	No actions recommended.

The findings of the September to October groundwater sampling event and the recommended actions are summarised in **Table 12** below.

Table 12 Summary of September biannual groundwater sampling event

Item	Comment	Recommended actions
Access to sampling locations	All proposed monitoring locations were accessible with the exception of MW22, which was located within a restricted construction area. Contingency well MW235 was sampled in lieu.	Prior arrangements to be made with construction company to access site, if necessary, in future visits. No other actions recommended.
Monitoring well network condition	Monitoring well MW115 was unable to be sampled due HydraSleeve™ being damaged upon retrieval. Monitoring wells MW197, MW240, MW241 and MW453 were dry and unable to be sampled.	Monitoring location MW115 should be examined for potential repairs. Monitoring wells MW197, MW240, MW241 and MW453 will be sampled during the end of wet season sampling event.
Analytical Results	PFAS concentrations were recorded above the LOR at 29 of 30 groundwater monitoring wells sampled.	No actions recommended.
New exceedance of PFAS NEMP 2.0 drinking water guideline values in groundwater	No locations reportedfirst-time detections or new exceedance of the PFAS NEMP 2.0 drinking water guideline values.	No actions recommended.
First-time detection of PFAS in groundwater	No locations reported first-time detections.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show an increasing trend in groundwater.	This will be evaluated in the annual interpretive report.	No actions recommended.
Sum of PFHxS of PFOS and/or sum of PFAS concentrations show a decreasing trend in groundwater.	This will be evaluated in the annual interpretive report.	No actions recommended.

5.2 Upcoming sampling events

The next sampling events will consist of biota sampling scheduled for October 2022 and surface water scheduled for November 2022. Twice yearly and monthly through wet season surface water sampling events will be scheduled to commence at the start of the wet season

5.3 Upcoming annual interpretive report

The next annual interpretive report, covering June 2022 through May 2023 is scheduled to be delivered in late 2023.

6.0 References

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Appendix A

Figures

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.5 1 2

Kilometres

1:45,000 (when printed at A3)

Legend

- RAAF Base Darwin
- Source Area
- Management Area
- Drainage
- Highway

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 Esri

Department of Defence
RAAF BASE DARWIN
PFAS OMP FACTUAL REPORT

Site and Management Area

PROJECT ID 60612561
CREATED BY [redacted]
LAST MODIFIED
VERSION: 1

Figure
1

[redacted]

A3 size

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DATUM GDA 1994, PROJECTION MGA ZONE 52

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Kilometers

1:20,000 (when printed at A3)

LEGEND

- RAAF Base Darwin
- Source Area
- Watercourses
- Highway
- Bi-annual Monitoring Locations

Note: MW235 was sampled as a contingency location for MW422

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

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RAAF BASE DARWIN
PFAS OMP FACTUAL REPORT
SEPTEMBER 2022

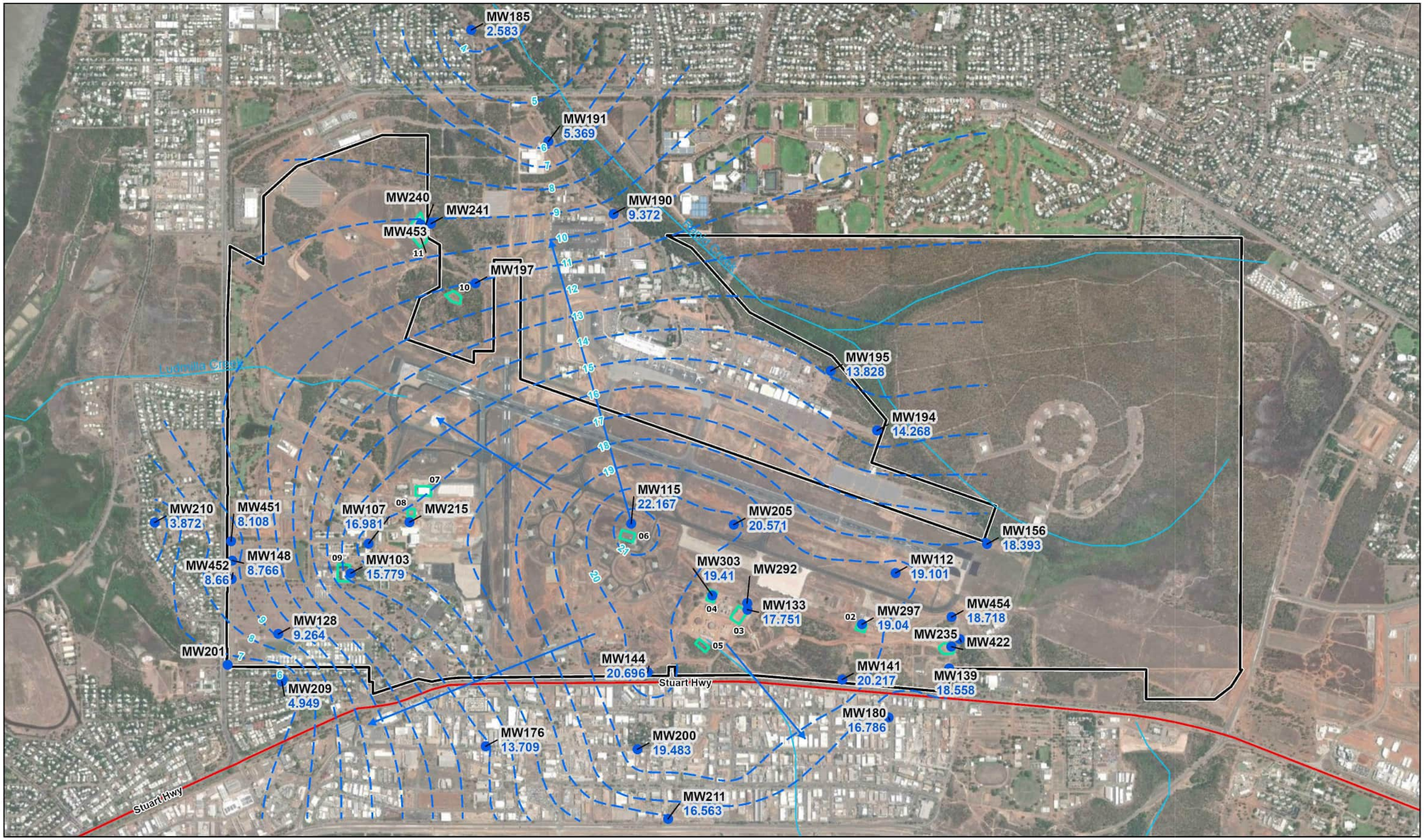
Groundwater Sampling Locations

PROJECT ID 60612561
CREATED BY [redacted]
LAST MODIFIED
VERSION:

Figure 2

[redacted]

A3 size



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Kilometers

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LEGEND

- RAAF Base Darwin
- Source Area
- Highway
- Watercourses
- Bi-annual Monitoring Locations
- Inferred Groundwater Level
- Inferred Groundwater Direction

Note: MW235 was sampled as a contingency location for MW422
Monitoring locations MW112, MW128 and MW133 were not included in contouring.

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

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PFAS OMP FACTUAL REPORT
SEPTEMBER 2022

Inferred Groundwater Contours

PROJECT ID 60612561
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VERSION: 1

Figure
3

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A3 size

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.2 0.4 0.6 0.8 1

Kilometers

1:35,000 (when printed at A3)

LEGEND

- RAAF Base Darwin
- Source Area
- Watercourses
- Highway
- Surface Water Locations

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

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RAAF BASE DARWIN
PFAS OMP FACTUAL REPORT
JUNE - AUGUST 2022

Surface Water Sampling Locations

PROJECT ID 60612561
CREATED BY [redacted]
LAST MODIFIED
VERSION:

Figure 4

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A3 size

Appendix B

Tables

Table T1
Groundwater Field Results
PFAS Ongoing Monitoring Program
Department of Defence- RAAF Base Darwin

Groundwater Field Results

AECOM

Location ID	Date	Depth to Water (mbTOC)	Well Depth (mbTOC)	TOC (mAHD)	Water Elevation (mAHD)	Condition of Gatic	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Redox (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method
MW103	26/09/2022	3.770	12.26	19.55	15.78	Good	2.27	84.1	50.46	5.66	143.1	30	Low	Brown	No odour	No sheen	Hydrasleeve
MW107	26/09/2022	4.960	15.10	21.94	16.98	Good	0.65	39.9	23.94	4.84	155.2	29.3	Low	Grey	No odour	No sheen	Hydrasleeve
MW112	7/10/2022	7.870	13.66	26.97	19.10	Good	2.08	40.2	24.12	4.47	131.5	32.3	Low	Grey	No odour	No sheen	Hydrasleeve
MW115	27/09/2022	10.240	14.92	32.41	22.17	Good	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Hydrasleeve
MW128	7/10/2022	2.130	14.62	11.39	9.26	Good	0.86	57.3	34.38	4.09	175.2	31.8	Low	Grey	No odour	No sheen	Hydrasleeve
MW133	19/10/2022	13.151	16.70	30.90	17.75	Good	1.76	97.5	58.5	7.09	-24.5	27.1	Low	Grey	No odour	No sheen	Hydrasleeve
MW139	27/09/2022	9.990	15.42	28.55	18.56	Good	1.1	35.3	21.18	4.52	156.8	30.2	Low	Grey	No odour	No sheen	Hydrasleeve
MW141	27/09/2022	9.880	15.94	30.10	20.22	Good	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Hydrasleeve
MW144	27/09/2022	9.990	15.71	30.69	20.70	Good	1.32	39.2	23.52	4.48	192.1	30.4	Low	Grey	No odour	No sheen	Hydrasleeve
MW148	27/09/2022	3.390	11.44	12.16	8.77	Good	0.71	61.5	36.9	4.3	162.8	30.9	Low	Grey	No odour	No sheen	Hydrasleeve
MW156	27/09/2022	4.650	12.07	23.04	18.39	Good	1.35	49.9	29.94	5.13	139	30.1	Low	Grey	No odour	No sheen	Hydrasleeve
MW176	26/09/2022	5.030	11.68	18.74	13.71	Good	1.67	36.4	21.84	5.06	140.3	29.7	Low	Grey	No odour	No sheen	Hydrasleeve
MW180	26/09/2022	12.270	15.02	29.06	16.79	Good	1.51	63.9	38.34	4.4	166.9	31.5	Low	Red-brown	No odour	No sheen	Hydrasleeve
MW185	27/09/2022	3.240	10.37	5.82	2.58	Good	0.94	618	370.8	4.61	168	30.4	Low	Grey	No odour	No sheen	Hydrasleeve
MW190	27/09/2022	1.970	12.38	11.34	9.37	Good	1.31	47.2	28.32	4.51	152.3	32.7	Low	Grey	No odour	No sheen	Hydrasleeve
MW191	27/09/2022	5.540	12.71	10.91	5.37	Good	1.25	61.4	36.84	4.43	167.6	31.8	Low	Grey	No odour	No sheen	Hydrasleeve
MW194	27/09/2022	3.970	12.42	18.24	14.27	Good	1.37	33.5	20.1	4.55	141.6	30.3	Low	Grey	No odour	No sheen	Hydrasleeve
MW195	27/09/2022	2.910	11.26	16.74	13.83	Good	1.45	37.2	22.32	4.56	160.1	29.8	Low	Orange	No odour	No sheen	Hydrasleeve
MW197	27/09/2022	ND	15.84	26.20	ND	Good	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Hydrasleeve
MW200	26/09/2022	6.750	11.72	26.23	19.48	Good	0.97	38.4	23.04	4.53	161.2	29.5	Low	Grey	No odour	No sheen	Hydrasleeve
MW205	27/09/2022	9.000	14.84	29.57	20.57	Good	2.39	40.8	24.48	4.77	131.5	31.2	Low	Grey	No odour	No sheen	Hydrasleeve
MW209	26/09/2022	2.020	11.31	6.97	4.95	Good	1.28	1451	870.6	5.21	157.7	28.9	Moderate	Red-brown	No odour	No sheen	Hydrasleeve
MW210	27/09/2022	3.040	11.38	6.91	3.87	Good	2.5	33.86	20.316	5.13	114.3	31.8	Moderate	Brown	No odour	No sheen	Hydrasleeve
MW211	26/09/2022	5.950	14.90	22.51	16.56	Good	1.99	471.2	282.72	6.07	160.3	27.8	Low	Grey	No odour	No sheen	Hydrasleeve
MW215	27/09/2022	8.140	15.18	26.37	18.23	Good	0.58	68.8	41.28	5.55	75.6	29.5	Low	Grey	No odour	No sheen	Hydrasleeve
MW235	27/09/2022	8.950	14.75	27.55	18.60	Good	0.8	38	22.8	4.82	176.6	30.1	Low	Grey	No odour	No sheen	Hydrasleeve
MW240	27/09/2022	ND	14.56	25.60	ND	Good	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Hydrasleeve
MW241	27/09/2022	ND	14.58	25.01	ND	Good	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Hydrasleeve
MW297	27/09/2022	10.490	15.33	29.53	19.04	Good	0.53	45.6	27.36	5.15	54.8	30.4	Low	Grey	Hydrocarbon	Hydrocarbon	Hydrasleeve
MW303	27/09/2022	12.530	15.70	31.94	19.41	Good	0.78	330.4	198.24	6.07	-34.5	30.4	Low	Grey	Hydrocarbon	Hydrocarbon	Hydrasleeve
MW451	27/09/2022	4.870	15.71	12.98	8.11	Good	0.99	88.4	53.04	5.23	155	30.1	Low	Grey	No odour	No sheen	Hydrasleeve
MW452	27/09/2022	2.730	13.45	11.39	8.66	Good	1.75	62.9	37.74	5.05	152.3	31.1	Low	Grey	No odour	No sheen	Hydrasleeve
MW453	27/09/2022	ND	15.11	17.13	ND	Good	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Hydrasleeve
MW454	27/09/2022	7.55	12.03	26.27	18.72	Good	0.93	48.4	29.04	4.29	215.2	31.1	Low	Grey	No odour	No sheen	Hydrasleeve

Notes:
mbTOC: metres below top of casing
mAHD: metres Australia Height Datum
ND: not detected
NM: not measured
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
°C: degrees celsius

Table T2
Groundwater Analytical Results
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Base Darwin

Groundwater Analytical Results

AECOM

				PFAS Full Suite																												
				10:2 FTS	4:2 FTS	6:2 FtS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTeDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
			LOR	0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																														**0.07**	**0.07**	**0.56**	**0.07**
PFAS NEMP 2020 Freshwater 99%																															*0.00023*	*19*	
Location	**Date**	**Field ID**	**Lab Report**																														
MW103	29/09/2022	1302_MW103_220929	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.97	0.1	0.04	<0.02	<0.02	0.9	0.44	3.95	0.02	<0.02	1.98	0.38	<0.05	<0.02	<0.02	58.5	**48.6**	***28.8***	**1.11**	**19.8**
MW107	29/09/2022	1302_MW107_220929	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	<0.1	<0.02	<0.02	<0.02	0.2	0.08	0.67	<0.02	<0.02	0.33	0.12	<0.05	<0.02	<0.02	10.9	**9.11**	***6.36***	0.17	**2.75**
MW112	10/10/2022	1302_MW112_221010	ES2236478	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.34	<0.1	0.03	<0.02	<0.02	0.27	0.11	0.86	<0.02	0.04	0.35	0.16	<0.05	<0.02	<0.02	20.4	**17.9**	***14.8***	0.29	**3.13**
MW128	10/10/2022	1302_MW128_221010	ES2236478	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	<0.1	<0.02	<0.02	<0.02	0.16	0.08	0.56	<0.02	<0.02	0.27	0.14	<0.05	<0.02	<0.02	10.8	**9.11**	***6.48***	0.19	**2.63**
MW133	29/09/2022	1302_MW133_220929	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.01	0.01	*0.01*	<0.01	<0.01
MW133	21/10/2022	1302_MW133_221021	ES2238035	<0.05	<0.05	0.14	0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.62	0.2	0.03	<0.02	<0.02	0.96	0.31	2.79	<0.02	0.04	0.88	0.49	<0.05	<0.02	<0.02	63.4	**56**	***47.2***	**0.8**	**8.84**
MW139	29/09/2022	1302_MW139_220929	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.12	<0.02	<0.02	0.07	0.02	<0.05	<0.02	<0.02	2.29	**1.94**	***1.45***	0.04	**0.49**
MW141	29/09/2022	1302_MW141_220929	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.32	**0.32**	***0.17***	<0.01	**0.15**
MW144	28/09/2022	1302_MW144_220929	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.19	<0.1	<0.02	<0.02	<0.02	0.1	0.03	0.27	<0.02	<0.02	0.19	0.05	<0.05	<0.02	<0.02	5.46	**4.55**	***3.12***	0.08	**1.43**
MW148	28/09/2022	1302_MW148_220928	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.2	0.04	0.23	<0.02	<0.02	0.25	0.04	<0.05	<0.02	<0.02	9.57	**8.56**	***5.43***	0.11	**3.13**
MW156	28/09/2022	1302_MW156_220928	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.17	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.26	<0.02	<0.02	0.16	0.06	<0.05	<0.02	<0.02	5.56	**4.76**	***3.33***	0.04	**1.43**
MW176	29/09/2022	1302_MW176_220929	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	<0.02	0.04	<0.05	<0.02	<0.02	0.23	**0.13**	***0.09***	0.01	0.04
MW180	29/09/2022	1302_MW180_220929	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.31	**0.27**	***0.15***	<0.01	**0.12**
MW185	28/09/2022	1302_MW185_220928	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	0.5	**0.38**	***0.12***	0.02	**0.26**
MW190	28/09/2022	1302_MW190_220928	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.1	0.03	0.29	<0.02	<0.02	0.19	0.05	<0.05	<0.02	<0.02	5.26	**4.39**	***2.78***	0.08	**1.61**
MW191	28/09/2022	1302_MW191_220928	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.05	<0.02	0.17	<0.02	<0.02	0.11	0.03	<0.05	<0.02	<0.02	3.67	**3.18**	***2.14***	0.05	**1.04**
MW194	28/09/2022	1302_MW194_220928	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.27	<0.02	<0.02	0.14	0.04	<0.05	<0.02	<0.02	4.6	**3.84**	***2.7***	0.08	**1.14**
MW195	28/09/2022	1302_MW195_220928	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.02	0.06	<0.02	<0.05	<0.02	<0.02	1.63	**1.44**	***0.92***	0.01	**0.52**
MW200	29/09/2022	1302_MW200_220929	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.05	<0.02	0.18	<0.02	<0.02	0.08	0.03	<0.05	<0.02	<0.02	2.95	**2.49**	***1.35***	0.04	**1.14**
MW205	28/09/2022	1302_MW205_220928	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.02	0.06	<0.02	<0.05	<0.02	<0.02	1.64	**1.45**	***0.91***	0.01	**0.54**
MW209	28/09/2022	1302_MW209_220928	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
MW210	28/09/2022	1302_MW210_220928	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	<0.1	<0.02	<0.02	<0.02	0.06	0.02	0.12	<0.02	<0.02	0.08	0.03	<0.05	<0.02	<0.02	3.35	**2.87**	***2.13***	0.05	**0.74**
MW211	29/09/2022	1302_MW211_220929	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.03	0.03	*0.02*	<0.01	0.01
MW215	29/09/2022	1302_MW215_220929	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	<0.1	<0.02	<0.02	<0.02	0.14	0.06	0.35	<0.02	<0.02	0.2	0.09	<0.05	<0.02	<0.02	7.08	**5.97**	***4.2***	0.09	**1.77**
MW235	29/09/2022	1302_MW235_220929	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.76	0.2	0.05	<0.02	<0.02	0.44	0.21	1.88	<0.02	0.03	0.81	0.35	<0.05	<0.02	<0.02	27.9	**22.7**	***16.5***	0.48	**6.22**
MW297	29/09/2022	1302_MW297_220929	ES2235227	<0.05	<0.05	<0.05	0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.92	0.2	0.07	<0.02	<0.02	0.82	0.34	2.16	<0.02	<0.02	1.08	0.29	<0.05	<0.02	<0.02	48.5	**41.8**	***35.2***	**0.75**	**6.62**
MW303	29/09/2022	1302_MW303_220929	ES2235227	<0.05	<0.05	0.1	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	5.45	1.1	<0.02	<0.02	<0.02	2.64	1.39	11.4	<0.02	0.04	7.69	1.63	<0.05	<0.02	<0.02	116	**81.3**	***49.9***	**3**	**31.4**
MW451	28/09/2022	1302_MW451_220928	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.02	0.02	*0.02*	<0.01	<0.01
MW452	28/09/2022	1302_MW452_220928	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.08	0.02	0.14	<0.02	<0.02	0.12	0.03	<0.05	<0.02	<0.02	4.84	**4.33**	***2.72***	0.04	**1.61**
MW454	29/09/2022	1302_MW454_220929	ES2235227	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.43	0.4	<0.02	<0.02	<0.02	1.13	0.42	3.86	<0.02	<0.02	2.75	0.66	<0.05	<0.02	<0.02	55.7	**43.2**	***28***	**0.81**	**15.2**

Notes:
µg/L: micrograms per litre
LOR: limit of reporting
* LOR is above guideline value
Denotes exceedance of PFAS NEMP 2020 Drinking Water
Denotes exceedance of PFAS NEMP 2020 Maintenance of Ecosystem (Freshwater 99%)
Denotes first time detection above LOR for Sum of PFHxS+PFOS or PFOA
Denotes new exceedance of human health screening criteria

Table T3
SW Field Results
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Base Darwin

Surface Water Field Results

Location ID	Sampled Date	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Redox (mV)	Redox corrected (mV)	Temp (^{o}C)	Turbidity	Water Colour	Odour	Sheen	Sample Method
SW109	30/06/2022	3.65	180.2	108.1	5.86	-215.4	-7.3	22.7	Low	Light brown	Odourless	No Sheen	Grab Sample
SW109	26/08/2022	2.78	431.0	258.6	5.12	64.3	272.2	22.9	-	-	-	-	Grab Sample

Notes:
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
NTU: nephelometric turbidity unit
^{o}C: degrees celsius

Table T4
SW Analytical Results
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Darwin

Surface Water Analytical Results

AECOM

				PFAS Full Suite																														
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTeDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2020 Freshwater 99%																															*0.00023*	*19*	
PFAS NEMP 2020 Recreational Water																															**2**		**10**	
Location	**Date**	**Field ID**	**Lab Report**																															
SW109	30/06/2022	1302_SW109_220630	ES2222496	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.09	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	1.2	0.99	*0.64*	0.02	0.35
SW109	26/08/2022	1302_SW109_220826	ES2230718	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.11	<0.02	<0.02	0.1	0.03	<0.05	<0.02	<0.02	2.15	1.77	*1.03*	0.04	0.74

Notes:
µg/L: micrograms per litre
LOR: limit of reporting
Denotes exceedance of PFAS NEMP 2020 Drinking Water
Denotes exceedance of PFAS NEMP 2020 Maintenance of Ecosystem (Freshwater 99%)
Denotes first time detection above LOR for Sum of PFHxS+PFOS or PFOA
Denotes new exceedance of human health screening criteria

Appendix C

Sampling Logs

ANZ

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:	~~WQMP~~ PFASOMP	Project Number:	60612561	PM Name:	[redacted]	Sample Date:	30.06.22
Client:	DoD	Project Location:	DARWIN	Fieldwork Staff:		Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☒ Other (specify) GRAB	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

Time	Cumulative Vol. Removed (L)	~~SWL~~ (m-pvc)	Pump Rate	DO (ppm or ~~mg/L~~)	E.C. (~~mS/cm~~ or ~~µS/cm~~)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
10:41	0.5	SW106	–	3.65	180.2	5.86	-215.4	22.7	Moderate flow, light brown, low turb, rubbish upstream, no odour.
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information	Field Comments
Field Filtered:	Unfiltered:		x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)	QC100 / QC200	Bore volume calculation, bore condition, fate of tubing, redox correction etc.
0	2		x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic		quarterly SW for RAAF DARWIN.
		2	xPFAS						

Approval and Distribution

[redacted]

ANZ

FQM - NAPL and Groundwater Level Gauging Record

AECOM

Q4AN(EV)-414-FM1

Project Name:	WQMP	Project Location:	RAAF DARWIN	PM Name:	[redacted]
Project Number:	606/12561.	Client:	Ventia	Fieldwork Staff Name:	

Confirm NAPL and groundwater levels by repeat measurements. All columns must be completed. If NAPL is not present in a well write 'ND' (Not Detected) in the relevant column.

Field Data

Well ID	Date (dd/mm/yy)	Time (24hr:mm)	PID Reading (ppm)	Depth to LNAPL (mBTOC)	Depth to Groundwater (mBTOC)	LNAPL Thickness (m)	Depth to DNAPL (mBTOC)	Total Well Depth (mBTOC)	DNAPL Thickness (m)	Comments (well condition, odour, NAPL colour and viscosity)
MW103	26/09/	11:03.			3.77			12.26		
MW107	26/09/	11:28			4.96			15.10		
MW209	26/09.	~~12.08~~ 12.05			2.02m			17.51		
MW180	26/09	12.55			12.27m			15.02		
MW200	26/09	~~13.40~~			6.73m			11.72		
MW211	26/09	14.07			5.95m			14.90m		Need new bolts & unable to
MW176	26/09	14.31.			5.04			11.68		Water from retr. in well hole
MW200	~~27~~/09	~~13.40~~ 8:00			3.04			11.38		
MW453	27/09	9.16.						~~15.77~~		dry ~~dry~~ has hydrosleeve in it
MW240	27/09	9.45.						12.56		dry
MW241	27/09	9.52.						14.58		dry
MW197	27/09	10.02.						15.04		dry
MW195	27/09	10.33.			2.91			11.76		
MW194	27/09	10.43.			3.97			12.42		
MW156	27/09	10.58.			4.95			12.07		
MW112	27/09	11:18			8:30			14.92		
MW205	27/09	11.35.			9.00m			14.84		
MW115	27/09	11.48			10.24			14.92.		Hydrasleeve deployed -
MW193	~~27/09~~	12.14								Hydra deployed
MW190	27/09	12.18.			10.97			12.78		Has been damaged/removed - photos.

Measurement Equipment

Make & Model:		Supplier:	
Serial No.:		Calibration Report Provided?	

Notes/Comments

(PID) - photo ionisation detector; (ppm) - parts per million; (LNAPL) - light non-aqueous phase liquids; (DNAPL) - dense light non-aqueous phase liquid; (mBTOC) - metres below top of casing

Approval and Distribution

Distribution: [redacted]

AECOM

ANZ

FQM - NAPL and Groundwater Level Gauging Record

Q4AN(EV)-414-FM1

Project Name:	EnQuip	**Project Location:**	RAAF DARWIN	**PM Name:**	[redacted]
Project Number:	60616256	**Client:**	Ventia	**Fieldwork Staff Name:**	[redacted]

Confirm NAPL and groundwater levels by repeat measurements. All columns must be completed. If NAPL is not present in a well write 'ND' (Not Detected) in the relevant column.

Field Data

Well ID	Date (dd/mm/yy)	Time (24hr:mm)	PID Reading (ppm)	Depth to LNAPL (mBTOC)	Depth to Groundwater (mBTOC)	LNAPL Thickness (m)	Depth to DNAPL (mBTOC)	Total Well Depth (mBTOC)	DNAPL Thickness (m)	Comments (well condition, odour, NAPL colour and viscosity)
MW191	27/09	12:29.			5.54			12.71		(
MW185	27/09	12.40			3.24			10.37		✓ photos.
~~MW155~~ MW235	27/09	13:27			8.95			14.75		No access Sampled MW235 contingency.
										(photo x24 1.22pm)
MW454	27/09	13:44			7.55			12.03		
~~MW405~~	~~27/09~~									— CONT. photo 246 pm
MW215	27/09	14:21			8.14			15.18		
MW128	27/09	15:04			2.17			14.61		
MW451	27/09	15:20.			4.87			13.71		
MW148	27/09	15:29			3.39			11.44		
MW452	27/09	15:37			2.73			13.45		
MW144	27/09	16:03.			9.99			15.72		
MW363	27/09	16:16.			12.53			15.70		Hydro carbon smell
~~MW373~~	~~27/09~~	~~16:55~~					(photo	~~4.32pm~~		Fixed into water outlet.
MW297	27/09	16:43.			10.49			15.33		
MW139	27/09	16:56			9.99			15.42		
MW141	27/09	17:15			9.88			15.94		

Measurement Equipment

Make & Model:		**Supplier:**	
Serial No.:		**Calibration Report Provided?**	

Notes/Comments

(PID) - photo ionisation detector; (ppm) - parts per million; (LNAPL) - light non-aqueous phase liquids; (DNAPL) - dense light non-aqueous phase liquid; (mBTOC) - metres below top of casing

Approval and Distribution

[redacted]

Distribution: Project Central File

(3)

ANZ

FQM - NAPL and Groundwater Level Gauging Record [redacted]

AECOM

EV)-414-FM1

Project Name:	OMP PFAS	**Project Location:**	RAAF DARWIN	**PM Name:**	[redacted]
Project Number:	60612561	**Client:**	VENTIA	**Fieldwork Staff Name:**	[redacted]

Confirm NAPL and groundwater levels by repeat measurements. All columns must be completed. If NAPL is not present in a well write 'ND' (Not Detected) in the relevant column.

Field Data

Well ID	Date (dd/mm/yy)	Time (24hr:mm)	PID Reading (ppm)	Depth to LNAPL (mBTOC)	Depth to Groundwater (mBTOC)	LNAPL Thickness (m)	Depth to DNAPL (mBTOC)	Total Well Depth (mBTOC)	DNAPL Thickness (m)	Comments (well condition, odour, NAPL colour and viscosity)
MW12	7/10	9.40					2.13m	14.60m		Hydro deployed
MW12	5/10	10.50					~~2.97m~~	13.66		

Measurement Equipment			
Make & Model:		**Supplier:**	AECOM
Serial No.:		**Calibration Report Provided?**	N

Notes/Comments

(PID) - photo ionisation detector; (ppm) - parts per million; (LNAPL) - light non-aqueous phase liquids; (DNAPL) - dense light non-aqueous phase liquid; (mBTOC) - metres below top of casing

Approval and Distribution [redacted]

Distribution: Project Central Fil [redacted]

ANZ

FQM - NAPL and Groundwater Level Gauging Record

AECOM

Q4AN(EV)-414-FM1

Project Name:	CMP PFAS	**Project Location:**	RAAF DARWIN	**PM Name:**	[redacted]
Project Number:	60612561	**Client:**	VENTIA	**Fieldwork Staff Name:**	

Confirm NAPL and groundwater levels by repeat measurements. All columns must be completed. If NAPL is not present in a well write 'ND' (Not Detected) in the relevant column.

Field Data

Well ID	Date (dd/mm/yy)	Time (24hr:mm)	PID Reading (ppm)	Depth to LNAPL (mBTOC)	Depth to Groundwater (mBTOC)	LNAPL Thickness (m)	Depth to DNAPL (mBTOC)	Total Well Depth (mBTOC)	DNAPL Thickness (m)	Comments (well condition, odour, NAPL colour and viscosity)
133	11/10		~~[illegible]~~		13.15			16.70		17.15 out - 4m = 13.15

Measurement Equipment

Make & Model:		**Supplier:**	AECOM
Serial No.:		**Calibration Report Provided?**	N

Notes/Comments

(PID) - photo ionisation detector; (ppm) - parts per million; (LNAPL) - light non-aqueous phase liquids; (DNAPL) - dense light non-aqueous phase liquid; (mBTOC) - metres below top of casing

Approval and Distribution

[redacted]

Distribution: Project Centra[redacted]

AECOM

ANZ

FQM - Groundwater Sampling and Purging Record

1302_MW... - 220928

Q4AN(EV)-405-FM1

Project Name:	GWMP PEAS	Project Number:	60612561	PM Name:	[redacted]	Bore ID:	
Client:	Santos	Project Location:	RAAF DARWIN	Fieldwork Staff:		Sample Date:	28/09/22
						Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Pump Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump Rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
7.00	MW210		✓	2.5	328.6	5.13	114.3	31.8	Brown, murky
8.18	MW136		✓	1.35	49.9	4.57	139.	30.1	little bit murky but mostly clear
~~8.40~~	~~MW112~~			~~2.02~~	~~47.6~~	~~4.37~~	~~154.8~~	~~31.8~~	~~little murky.~~
8.59	MW205		✓	2.39	40.8	4.77	131.5	31.2	murky brown/red
9.16	MW115								Hydrasleeve broke photo 9.22am
9.38	MW195		✓	1.45	37.2	4.56	160.1	29.8	Dup B Trip taken (clear orange slime on bottom)
10.27	MW194		✓	1.77	33.5	4.55	141.6	30.3	Cloudy
10.46	MW190		✓	1.31	47.2	4.91	152.3	32.7	cloudy.
11.05	MW192		✓	1.25	61.4	4.43	167.6	31.8	cloudy.
11.24	MW185		✓	0.94	618.00	4.61	168.0	30.4	cloudy
11.56	MW209		✓	1.28	1451.00	5.21	157.7	26.9	Dup B Trip (QAQC) cloudy
~~12.34~~	~~MW128~~			~~0.99~~	~~56.9~~	~~3.84~~	~~149.8~~	~~31.0~~	
12.55	MW451		✓	0.99	68.4	5.23	155.0	30.1	Cloudy. Bit brownier on bottom
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information	Field Comments
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)			Bore volume calculation, bore condition, fate of tubing, redox correction etc.
		x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic			

Approval and Distribution

[redacted]

ANZ

FQM - Groundwater Sampling and Purging Record

AECOM

Q4AN(EV)-405-FM1

Project Name:	OMP PFAS	Project Number:	60612561 -	PM Name:	[redacted]	Bore ID:	
Client:	Iconiq	Project Location:	RAAF PARKES	Fieldwork Staff:		Sample Date:	29/09 - 29/09
						Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
1305	28/9	MW146	✓	0.71	61.5	4.30	162.8	30.9	cloudy - more at bottom
12.20	28/9	MW452	✓	1.75	62.6	5.05	152.3	31.1	Dup & Trip cloudy - more to bottom
7.30	29/9	MW180	✓	1.51	63.9	4.40	166.9	31.5	mostly clear little brown/muddy clay colour
8.05	29/9	MW200	✓	0.97	38.4	4.53	161.2	29.5	cloudy
8.30	29/9	MW211	✓	1.99	471.2	6.07	160.3	27.8	Dup & Trip3 - little cloudy
9.00	29/9	MW176	✓	1.67	36.4	5.06	160.3	29.7	cloudy
9.30	29/9	MW103	✓	2.27	84.1	5.66	143.1	30.0	cloudy - darker bottom way (brown red)
9.50	29/9	MW167	✓	0.65	39.9	4.89	155.2	29.3	cloudy -
10.001	29/9	MW215	✓	0.98	68.8	5.55	75.6	29.5	cloudy
11.50	29/9	MW144	✓	1.32	39.2	4.48	190.1	30.4	Dup & Trip cloudy (photo x1 12:25 pm more from water out of sleeve than from the well)
12.20	29/9	MW303	✓	0.78	330.4	6.07	-34.5	30.4	strong hydrocarbon smell
12.50	29/9	MW137	✓	1.57	91.8	6.54	130.1	31.9	sampled from water outlet / valve
									(photo x2 12:42 pm & 12:43 pm)
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information	Field Comments
Field Filtered:	Unfiltered:		x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.
			x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic		

Approval and Distribution

[redacted]

AECOM

ANZ

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

(3)

Project Name:	AMP PFAS	Project Number:	60612561	PM Name:	[redacted]	Bore ID:	
Client:	VENTIA.	Project Location:	RAAF DARWIN	Fieldwork Staff:		Sample Date:	29/09/22
						Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
13:00	29/9	MW297	✓	0.53	45.6	5.15	54.8	30.4	0.1 slick on top Hydrosleeve (10mm) (Photo x2 1:07pm 29/9/22) strong Hydro Carbon smell. Next to Hanger. (Photo x1 12:59pm) Odour
13:30	29/9	MW139	✓	1.10	35.3	4.52	156.8	30.2	cloudy darker ⇒ bottom
13:50	29/9	MW235	(422) ✓	0.80	38.0	4.82	176.6	30.1	cloudy.
14:00	29/9	MW454	✓	0.93	48.4	4.29	215.2	31.1	"
14:20	29/9	MW144	✓	0.65	44.2	4.71	188.2	29.7	cloudy
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

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Analytes Sampled for:		Bottles Collected						QA/QC Information	Field Comments
Field Filtered:	Unfiltered:		x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.
			x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic		

[redacted]

AECOM

ANZ

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

(44)

[redacted]

Project Name:	FEAS	Project Number:	60612561	PM Name:		Bore ID:	
Client:	VONTRON	Project Location:	RAPE CA RWIN	Fieldwork Staff:		Sample Date:	19/10/22
						Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	hod	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	th:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	**Corrected Redox:** Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	**Parameter method:** ☐ Downhole		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
850	10/10	MW112	//	2.08	402	4.47	-131.5	32.3	DCS fakan 100, 200, 306
930	10/10	MW128	//	0.86	57.3	6.09	175.2	31.8	
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information	Field Comments
Field Filtered:	Unfiltered:		x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.
			x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic		

[redacted]

AECOM

ANZ

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:	OMP PFAS	Project Number:	60612561	PM Name:	[redacted]	Bore ID:	
Client:	VENTIA	Project Location:	RARF DARWIN	Fieldwork Staff:		Sample Date:	19/10/22
						Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ [redacted] rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				Parameters

Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:	Total purged volume (L):

Water Quality Parameters

Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
19/10 P.30	21.10	MNTR	NA	~~2.46~~ 1.76	975	7.09	-24.5	27.1	
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information	Field Commets
Field Filtered:	Unfiltered:		x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.
			x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic		

Approval and Distribution

[redacted]

Both trip & Dup from same MW

AECOM

ANZ

FQM - Sample QAQC Tracking Sheet

Q4AN(EV)-011-FM1

Project Name:	OMP PFAS	**Project Number:**	60612561
Project Location:	RAAF DARWIN	**Client:**	
PM Name:	[redacted]	**Fieldwork Staff:**	[redacted]

QAQC Information

QAQC ID	Primary Sample ID	Sample Type	Batch Number
QC100 ✓	MW195	Dup	28/09/22
QC200 ✓	MW195	Trip	
QC100 ✓	MW209	Dup	
QC200	MW209	Trip	
QC300 ✓	"	Rinsate	
QC400	"	Field	
QC100 ✓	MW452	Dup	
QC200	MW452	Trip	
QC500		Trip Blank	
			29/09/22.
QC100 ✓	MW211	Dup	
QC200	MW211	trip	
QC300 ✓		rinsate	
QC400		field	
QC100 ✓	MW144	Dup	
QC200	MW144	trip blank	
QC500 ✓			
			10/10
QC100 ✓	MW112	DUP	
QC200	MW112	TRIP	
QC300 ✓	MW112	rinsate	
QC400		Field	
QC500		Trip blank	

QA\QC Project Requirements

QAQC	Required		Frequency		Method Used
Field Duplicates	☑ Yes	☐ No	☑ 1 in 10	☐ 1 in 20	
Field Triplicates	☑ Yes	☐ No	☑ 1 in 10	☐ 1 in 20	
Rinsate Blanks	☑ Yes	☐ No	☑ 1 per matrix/equipment/day		
Field Blanks	☑ Yes	☐ No	☑ 1 per day		
Trip Blanks	☑ Yes	☐ No	☑ 1 per ice chest		
Trip Spikes	☒ Yes	☑ No	☑ 1 per ice chest		

Approval and Distribution

[redacted]

Distribution: Project Central File

Appendix D

Data Validation Reports

DATA VALIDATION REPORT; WATER

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:** 09/11/2022	
Site:	1302 – RAAF Base Darwin		
Matrix:	Water	**Data Verified by:**	[redacted]
Laboratory:	ALS; NMI	**Date:** 10/11/2022	
Lab reference:	**Jun SW:** ES2222496, EM2212650, **Aug SW:** ES2230718, RN1365240, RN1365241 **Oct – Sep MW:** ES2235227, ES2236478, ES2238035, RN1368680, RN1369431		

Key Findings:

The analytical data can be used as a basis for interpretation subject to the limitations outlined below:

- Elevated RPDs should be taken into consideration when using data for PFOS, PFHxS, PFOA and Sum of PFHxS & PFOS close to guidelines. quantitatively and when interpreting data for sum of PFOS, PFHxS PFOA and Sum of PFHxS and PFOS close to guidelines from primary batches ES2230718, ES2235227 and ES2236478.
- The potential exists for concentrations of PFOS to be below the LOR, but above the guideline in samples MW209 and should be taken into consideration when interpreting results.
- The potential exists for concentrations of PFDS, PFUnDA, PFDoDA, PFTrDA, PFTeDA, MeFOSA, EtFOSA, MeFOSE, EtFOSE, MeFOSAA, EtFOSAA, 4:2 FTS, 10:2 FTS to be biased low, this potential for under reporting should be taken into consideration when using results quantitatively.

Component		Outliers			Material impact on interpretation
		No	Yes	Comment	
Frequency of field quality assurance/quality control (QA/QC)		✓			
Number of tests requested/reported			✓	1	No
Sample handling/preservation/holding times			✓	2	No
Frequency of laboratory QA/QC			✓	3	No
Limits of reporting (LOR)			✓	4	No
Blank analysis	Field blank	✓			
	Rinsate blank		✓	5	No
	Trip blank		✓	6	No
	Method blank	✓			
Field intra-laboratory relative percent differences (RPDs)			✓	7	No
Field inter-laboratory RPDs			✓	8	No
Laboratory duplicate RPDs		✓			
Matrix spike (MS) % recoveries			✓	9	No
Laboratory control spike (LCS) % recoveries		✓			
Surrogate % recoveries		✓			
Other observations		✓			

Comments	
1. Number of tests reported/requested	**September 2022 groundwater:** Rinsate blanks were collected at a frequency of one per sampling day (four in total). Rinsate blanks from the 28 and 29 September 2022 were destroyed during transit and therefore not analysed. For further comment on rinsates please see Section 5.
2. Sample handling	Primary samples were received at ALS laboratory preserved and chilled within the acceptable range (<6ºC), with the below exceptions:

Event	Batch Number	Temperature
June 2022	ES2222496	11.4°C
September – October 2022	ES2238035	25.1°C
	ES2236478	18.0°C

The sample receipt temperatures were not recorded for the NMI inter-laboratory duplicate samples; however the samples were noted to be “chilled”.
Potential degradation of analytes and under reporting must be taken into consideration. However, as the receipt temperature was below the ambient groundwater temperature at the time of sampling (~35ºC) and the samples were immediately cooled upon collection, this is not considered to significantly impact the interpretation of results.

3. Frequency of laboratory QAQC	Laboratory duplicate samples were not reported for PFAS analytes in laboratory batches ES2238035 and ES2235227. The precision of the data can be assessed as acceptable based on intra- and inter-laboratory duplicate RPDs which were reported at the required frequencies and generally within control limits. Matrix spikes were not reported at the required frequencies for PFAS analytes in batch ES2235227. The accuracy of the data can be assessed as acceptable based on method blanks, LCS and surrogate spike recoveries (which were reported at the required frequencies and within control limits).
4. Limits of reporting	Limits of reporting were sufficiently low to enable assessment against adopted guideline criteria, with the exception of PFOS in all primary lab batches. The potential exists for concentrations of PFOS to be below the LOR, but above the 99% freshwater ecosystem species guideline in samples MW209 and should be taken into considerations when interpreting results.

5. Rinsate blank	**June 2022 surface water:** Rinsate blanks were not collected during the June 2022 sampling event due to no decontaminated equipment was used. The sample was collected from the creek directly into the laboratory supplied container whilst wearing dedicated and disposable nitrile gloves. **September 2022 groundwater:** As discussed in Section 1 Rinsate blanks from the 28 and 29 September 2022 were destroyed during transit and therefore not analysed. However, the decontamination methods are assessed as acceptable and the potential for cross contamination via sampling methods is considered unlikely based on the following: • All sampling equipment was either dedicated, disposable or decontaminated with a solution of water and Liquinox between sampling locations • The decontamination methods and field staff were consistent over the course of the sampling event • Concentrations of all analytes were reported below the LOR in the rinsate sample analysed • Laboratory results are consistent with field observations and no evidence of cross contamination is apparent
6. Trip Blank	**September – October 2022 groundwater:** Trip blanks were collected at the frequency of one per esky (two water in total) with the exception of the surface water sampling on the 26 September 2022 and the groundwater third mobilisation on the 19 October 2022. As the available trip blank samples and rinsate blank samples reported concentrations of all volatile analytes below the LOR, cross contamination via volatilisation during transport to the laboratory is assessed to not have occurred.
7. Field intra-laboratory duplicate RPDs	Field intra-laboratory duplicate RPDs were reported within control limits, with the exception of the following analytes (high concentration in bold): - 1302_MW452_220928 & **1302_QC102_220928** for PFHxS (40%) This apparent lack of precision should be taken into consideration when interpreting concentrations for PFHxS close to guidelines.

8. Field inter-laboratory duplicate RPDs	Field inter-laboratory duplicate RPDs were reported within control limits, with the exception of the following analytes (higher concentration in bold): - **1302_SW109_220826** & 1302_QC200_220826 for Sum of PFAS (40%) - **1302_SW109_220826** & 1302_QC200_220826 for PFOS (39%) - **1302_SW109_220826** & 1302_QC200_220826 for PFOA (50%) - 1302_MW211_220929 & **1302_QC200_220929** for PFBA (148%) - 1302_MW211_220929 & **1302_QC200_220929** for Sum of PFAS (182%) - **1302_MW452_220928** & 1302_QC202_220928 for Sum of PFAS (38%) - **1302_MW452_220928** & 1302_QC202_220928 for Sum of PFHxS and PFOS (39%) - **1302_MW452_220928** & 1302_QC202_220928 for PFOS (41%) - **1302_MW452_220928** & 1302_QC202_220928 for PFHxS (38%) - **1302_MW112_221010** & 1302_QC200_221010 for PFBS (62%) - **1302_MW112_221010** & 1302_QC200_221010 for PFHpS (70%) - **1302_MW112_221010** & 1302_QC200_221010 for PFHxA (59%) - **1302_MW112_221010** & 1302_QC200_221010 for PFPeS (55%) - **1302_MW112_221010** & 1302_QC200_221010 for Sum of PFAS (67%) - **1302_MW112_221010** & 1302_QC200_221010 for Sum of PFHxS and PFOS (69%) - **1302_MW112_221010** & 1302_QC200_221010 for PFOS (73%) - **1302_MW112_221010** & 1302_QC200_221010 for PFOA (70%) - **1302_MW112_221010** & 1302_QC200_221010 for PFHxS (54%) As there are no adopted guideline values PFBA, Sum of PFAS, PFBS, PFHpS, PFHxA and PFPeS, the elevated RPDs are not expected to affect interpretation of results against guidelines. However, this apparent lack of precision should be taken into consideration when interpreting concentrations for PFOS, PFHxS, PFOA and Sum of PFHxS and PFOS close to guidelines.
9. Matrix Spike Recoveries	Matrix spike recoveries were not determined for PFHBS, PFPeS, PFHxS, PFHpS, PFOS, PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, FOSA, 6:2 FTS, 8:2 FTS, PFHxS and/or PFOS in batches ES2222496, ES2230718, and ES2235227 as background levels were greater than or equal to 4x spike levels. These non-determinations do not reflect method bias and do not affect data interpretation. The accuracy of the data can be assessed as acceptable based on method blanks, LCS and surrogate spike recoveries (which were reported at or above the required frequencies and within control limits), and available matrix spike recoveries for the same analytical method group (which were reported within control limits). Matrix spike recoveries (where reported) were within control limits for the June 2022 laboratory batch ES2222496, with the exception of several PFAS analytes, which could not be determined due to the samples being diluted outside of analytical range, as shown in the Certificate or Analysis and the Quality Control Interpretive report for ES2222496.

Data Validation Report
RPDs
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Base Darwin

Relative Percentage Differences - Water

AECOM

	Lab Report Number	ES2222496	ES2222496		ES2222496	EM2212650		ES2230718	ES2230718	
	Field ID	1302_SW109_220630	1302_QC100_220630	RPD	1302_SW109_220630	1302_QC200_220630	RPD	1302_SW109_220826	1302_QC100_220826	RPD
	Sample Type	Primary	Intra-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Intra-lab Duplicate	
	Date	30/06/2022	30/06/2022		30/06/2022	30/06/2022		26/08/2022	26/08/2022	
Analyte	**Units**	**LOR**								
PFAS Full Suite										
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<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 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<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 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.04	0.04	0	0.04	0.04	0	0.06	0.07	15
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	0.02	0.02	0	0.02	<0.02	0	0.04	0.04	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.09	0.07	25	0.09	0.06	40	0.11	0.12	9
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.04	0.04	0	0.04	0.04	0	0.1	0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	0.03	0.03	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Sum of PFAS	µg/L	0.01	1.2	1.1	9	1.2	0.93	25	2.15	2.26	5
Sum of PFHxS and PFOS	µg/L	0.01	0.99	0.91	8	0.99	0.77	25	1.77	1.86	5
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	0.64	0.58	10	0.64	0.5	25	1.03	1.06	3
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.02	0.02	0	0.02	0.02	0	0.04	0.04	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.35	0.33	6	0.35	0.27	26	0.74	0.8	8 *

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Data Validation Report
RPDs
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Base Darwin

Relative Percentage Differences - Water

AECOM

Lab Report Number			ES2230718	RN1365240		ES2235227	ES2235227		ES2235227	RN1368680		
Field ID			1302_SW109_220826	1302_QC200_220826	**RPD**	1302_MW211_220929	1302_QC100_220929	**RPD**	1302_MW211_220929	1302_QC200_220929	**RPD**	
Sample Type			Primary	Inter-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Inter-lab Duplicate		
Date			26/08/2022	26/08/2022		29/09/2022	29/09/2022		29/09/2022	29/09/2022		
Analyte	**Units**	**LOR**										
PFAS Full Suite												
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0	
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	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	
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0	
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	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	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.06	0.053	12	<0.02	<0.02	0	<0.02	<0.01	0	
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.05	0	<0.1	<0.1	0	**<0.1**	**0.67**	**148**	
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	0.04	0.019	71	<0.02	<0.02	0	<0.02	<0.01	0	
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.11	0.078	34	<0.02	<0.02	0	<0.02	<0.01	0	
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<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 (Interlab)	0.1	0.066	41	<0.02	<0.02	0	<0.02	<0.01	0	
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	0.03	<0.02	40	<0.02	<0.02	0	<0.02	<0.02	0	
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0	
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	
Sum of PFAS	µg/L	0.01	**2.15**	**1.426**	**40**	0.03	0.03	0	**0.03**	**0.67**	**182**	
Sum of PFHxS and PFOS	µg/L	0.01	**1.77**	**1.19**	**39**	0.03	0.03	0	0.03	<0.01	142	
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	**1.03**	**0.62**	**50**	0.02	0.02	0	0.02	<0.02	0	
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.04	0.02	67	<0.01	<0.01	0	<0.01	<0.01	0	
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.74	0.57	26	0.01	0.01	0	0.01	<0.01	0	

*RPDs have only been considered where a concentration is greater than 1 times the LOR.
**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Data Validation Report
RPDs
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Base Darwin

Relative Percentage Differences - Water

AECOM

Lab Report Number			ES2235227	ES2235227		ES2235227	RN1368680		ES2235227	ES2235227	
Field ID			1302_MW144_220929	1302_QC101_220929	**RPD**	1302_MW144_220929	1302_QC201_220929	**RPD**	1302_MW452_220928	1302_QC102_220928	**RPD**
Sample Type			Primary	Intra-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Intra-lab Duplicate	
Date			29/09/2022 13:50	29/09/2022 13:50		29/09/2022 13:50	29/09/2022 13:50		28/09/2022	28/09/2022	
Analyte	**Units**	**LOR**									
PFAS Full Suite											
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.19	0.21	10	0.19	0.13	38	0.08	0.12	40
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	0.1	0.1	0	0.1	0.063	45	0.08	0.11	32
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	0.03	0.03	0	0.03	0.02	40	0.02	0.03	40
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.27	0.32	17	0.27	0.19	35	0.14	0.19	30
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.19	0.21	10	0.19	0.14	30	0.12	0.19	45
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	0.05	0.05	0	0.05	0.038	27	0.03	0.04	29
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0
Sum of PFAS	µg/L	0.01	5.46	5.63	3	5.46	4.133	27	4.84	6.4	28
Sum of PFHxS and PFOS	µg/L	0.01	4.55	4.62	2	4.55	3.5	26	4.33	5.66	27
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	3.12	3.04	3	**3.12**	**2.2**	**35**	2.72	3.25	18
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.08	0.09	12	0.08	0.052	42	0.04	0.06	40
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	1.43	1.58	10	1.43	1.3	10	**1.61**	**2.41**	**40**

*RPDs have only been considered where a concentration is greater than 1 times the LOR.
**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Data Validation Report
RPDs
PFAS Ongoing Monitoring Program
Department of Defence - RAAF Base Darwin

Relative Percentage Differences - Water

AECOM

	Lab Report Number	ES2235227	RN1368680			ES2236478	ES2236478			ES2236478	RN1369431	
	Field ID	1302_MW452_220928	1302_QC202_220928	**RPD**		1302_MW112_221010	1302_QC100_221010	**RPD**		1302_MW112_221010	1302_QC200_221010	**RPD**
	Sample Type	Primary	Inter-lab Duplicate			Primary	Intra-lab Duplicate			Primary	Inter-lab Duplicate	
	Date	28/09/2022	28/09/2022			10/10/2022	10/10/2022			10/10/2022	10/10/2022	
Analyte	**Units**	**LOR**										
PFAS Full Suite												
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.05	0		<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.05	0		<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.05	0		<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.05	0		<0.05	0.023	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.05	0		<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0		<0.02	<0.01	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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.05	0		<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0		<0.02	<0.01	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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.08	0.07	13	0.34	0.35	3		**0.34**	**0.18**	**62**
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.05	0	<0.1	<0.1	0		<0.1	0.076	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	0.03	0.04	29		0.03	<0.01	100
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0		<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0		<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	0.08	0.044	58	0.27	0.27	0		**0.27**	**0.13**	**70**
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	0.02	0.016	22	0.11	0.12	9		0.11	0.057	63
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.14	0.096	37	0.86	0.9	5		**0.86**	**0.47**	**59**
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0		<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	0.04	0.04	0		0.04	<0.01	120
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.12	0.089	30	0.35	0.37	6		**0.35**	**0.2**	**55**
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	0.03	0.024	22	0.16	0.17	6		0.16	0.082	64
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.05	0		<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0		<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.02	0		<0.02	<0.01	0
Sum of PFAS	µg/L	0.01	**4.84**	**3.273**	**38**	20.4	20.1	1		**20.4**	**10.06**	**67**
Sum of PFHxS and PFOS	µg/L	0.01	**4.33**	**2.9**	**39**	17.9	17.6	2		**17.9**	**8.7**	**69**
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	**2.72**	**1.8**	**41**	14.8	14.4	3		**14.8**	**6.9**	**73**
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.04	0.034	16	0.29	0.25	15		**0.29**	**0.14**	**70**
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	**1.61**	**1.1**	**38**	3.13	3.18	2		**3.13**	**1.8**	**54**

*RPDs have only been considered where a concentration is greater than 1 times the LOR.
**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Data Validation Report
QAQC Blanks
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Base Darwin

QAQC Blanks - Water

Lab Report Number	ES2235227	ES2235227	ES2236478	ES2238035	ES2222496	ES2230718	ES2236478
Field ID	1302_QC300_220928	1302_QC300_220929	1302_QC300_221010	1302_QC300_221021	1302_QC400_220630	1302_QC400_220826	1302_QC400_221010
Date	28/09/2022	29/09/2022	10/10/2022	21/10/2022	30/06/2022	26/08/2022	10/10/2022
Sample Type	Rinsate	Rinsate	Rinsate	Rinsate	Field Blank	Field Blank	Field Blank

Analyte	Units	LOR							
PFAS Full Suite									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Data Validation Report
QAQC Blanks
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Base Darwin

QAQC Blanks - Water

Lab Report Number	ES2238035	ES2222496	ES2230718	ES2235227	ES2236478
Field ID	1302_QC400_221021	1302_QC500_220630	1302_QC500_220826	1302_QC500_220929	1302_QC500_221010
Date	21/10/2022	30/06/2022	26/08/2022	29/09/2022	10/10/2022
Sample Type	Field Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank

Analyte	**Units**	**LOR**					
PFAS Full Suite							
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Appendix E

Chain of Custody

8.7.

2 x 20ml PFAS bottles sent to Melbourne lab SYD - SMITHFIELD

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ALS BRISBANE 14 Byth Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

ALS ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

ALS TOWNSVILLE 14-15 Desma Court Garbutt QLD 4814 Ph: 07 4796 0600 E: townsville@alsglobal.com

ALS PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: perth.samples@alsglobal.com

ALS SYDNEY 277 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

ALS MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

ALS MELBOURNE 24 Hotham Road Summerhill VIC 3047 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

ALS NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4014 2500 E: newcastle@alsglobal.com

ALS GLADSTONE 1/11 Callemondah Drive Clinton QLD 4680 Ph: 07 4972 9000 E: gladstone@alsglobal.com

ALS DARWIN 27 Chaffey Crescent Northern Territory 0810 Ph: 08 8924 4500 E: darwin@alsglobal.com

ALS GOLD COAST 74 Kenny Street Tweed Heads NSW 2485 Ph: 02 6620 6555 E: goldcoast@alsglobal.com

ALS TOWNSVILLE 14-15 Desma Court Garbutt QLD 4814 Ph: 07 4796 0600 E: townsville@alsglobal.com

ALS ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

ALS ALBURY 1/13 Dalton Road Albury NSW 2640 Ph: 02 6041 3074 E: albury@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Darwin		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: ~~NT~~ ~~WOMP_22~~ NT_1302_PFASMP	ALS QUOTE NO.: SY-478-20-B-v2		Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: 60612561/	Invoicing ~~60612561~~ 60612561/4.1	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: 26.3 °C
PROJECT MANAGER: James Guzman	CONTACT PH:		Other comment:

[redacted]

RELINQUISHED BY: [redacted] DATE/TIME:

RECEIVED BY: [redacted] DATE/TIME: 01.07.22 8:00

RELINQUISHED BY: DATE/TIME:

RECEIVED BY: [redacted] DATE/TIME:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X	Suspended Solids - EA025H	Cations/ Anions - NT-01&02A	TRH/BTEXN/8 metals - W-05	8 Dissolved Metals - W-02	Additional metal (Fe) - EG020	MNA - W-28	Explosives - EP203SL	Tributyltin	VOC trip blank - W18	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	1302_SW106_220630	30-06-22	W	2x PFAS	3	X										
2	1302-QC100-220630		W	2x PFAS	2	X										
5 ~~X~~	1302_QC200_220630		W		2	X										
3	1302_QC400_220630		W		2	X										
4	1302_QC500_220630		W		2	X										
			W													
			W													
			W													
			W													
			W													
			W													
			W													
TOTALS																

Environmental Division Sydney
Work Order Reference
ES2222496

Telephone : + 61-2-8784 8555

LAB OF ORIGIN: DARWIN

PLS FWD TO ALS MELB

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

AECOM

Q4AN(EV)-007-FM1

AECOM 91220831 Rv 7/9

FQM - Generic Chain of Custody Form

CONSULTANT: [redacted]

PROJECT MANAGER (P[redacted]

PROJECT NUMBER & TASK CODE: 60667360

RESULTS REQUIRED (Date): Standard

P.O. NO.:

QUOTE NO.:

EMAIL REPORT TO: [redacted]

ANALYSIS REQUIRED incl[redacted]

ALS Sydney

FOR LABORATORY USE ONLY

COOLER SEAL (circle appropriate)

Intact: Yes No N/A

SAMPLE TEMPERATURE

CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Some labelled as 0900 but should be 1302 ⇒ Please correct

EP231x

Notes: e.g. Highly contaminated samples e.g. "High PAHs expected". Extra volume for QC or trace LORs etc.

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles	HOLD
	SAMPLE INFORMATION (note: S = Soil, W=Water)				CONTAINER INFORMATION		
1	1302_SW109_220826	W	26.8.22			2	X
2	0900_QC100_220826	W	"			2	X
	1302_QC200_220826	W	"			2	X
3	1302_QC400_220826	W	"			1	X
4	1302_QC500_220826	W	"			1	X

N22/017201

Forward to NMI

Subcon / Forward Lab / Split WO

Lab / Analysis: NMI

Organised By / Date: QC200

Relinquished By / Date:

Connote / Courier:

WO No: ES2230718

Attach By PO / Internal Sheet:

LAB OF ORIGIN: DARWIN

Environmental Division Sydney

Work Order Reference

ES2230718

Telephone : +61-2-8784 8555

RECEIVED 31 AUG 2022 BY: AO 1545 C

RELINQUISHED BY	RECEIVED BY	RECEIVED BY	METHOD OF SHIPMENT
Name: [redacted]	Name: ARASH	Name:	Con' Note No:
Of:	Of: ALS	Of:	Transport Co:
Date: .22	Date: 26/8	Date:	
	Time: 12:27 pm	Time:	

Water Contain[redacted] ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic

V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic;

F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Soil Container Codes: Jar = Unpreserved glass jar

COC Page of

NZ

FQM - Generic Chain of Custody Form

6.9.22

AECOM

Q4AN(EV)-007-FM1

CONSULTANT: [redacted]

PROJECT MANAGER ([redacted]

PROJECT NUMBER & T [redacted]

RESULTS REQUIRED ([redacted]

QUOTE NO.:

Destination Laboratory
ALS Sydney

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED Yes ( ) No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:
Some labelled as 0990 but
Should be 1302
⇒ Please correct

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

ALS ID	SAMPLE ID	MATRIX	DATE	Time	Container Type / Code	Total bottles	EP231X	HOLD	Notes: e.g. Highly contaminated samples e.g. "High PAHs expected". Extra volume for QC or trace LORs etc.
1	1302_SW109_220826	W	26.8.22			2	X		
2	0990_QC100_220826	W	"			2	X		
	1302_QC200_220826	W	"			2	X		Forward to NMI
3	1302_QC400_220826	W	"			1	X		
4	1302_QC500_220826	W	"			1	X		

Subcon / Forward Lab / Split WO
Lab / Analyses: NMI
Organised By / Date: QC200
Relinquished By / Date:
Connote / Courier:
WO No: ES2230718
Attach By PO / Internal Sheet:

LAB OF ORIGIN: DARWIN

Environmental Division
Sydney
Work Order Reference
ES2230718

Telephone : + 61-2-8784 8555

RELEASED BY	RECEIVED BY	RECEIVED BY	METHOD OF SHIPMENT
Name: [redacted]	Name: ARASH	Name: Kim	Con' Note No:
Of:	Of: ALS	Of: ALS	Transport Co:
Date: 26-8-22	Date: 26/08	Date: 30.8.22	
Time:	Time: 10:27am	Time: 7.00am	

Water Cont [redacted] N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic

V = VOA Via [redacted] Sulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic;

F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag. Soil Container Codes: Jar = Unpreserved glass jar

COC Page of

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: AECOM	TURNAROUND REQUIREMENTS : ☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)	
OFFICE:	☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact?	Yes No N/A
PROJECT: NT_1302_PFASCMP	SY/139/19 V3	Free Ice / frozen ice bricks present upon receipt?	Yes No N/A
ORDER NUMBER: 6061	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt:	°C
PROJECT MANAGER:	OF: 1 2 3 4 5 6 7	Other comment:	
SAMPLER: WR/SF/PH			
COC emailed to ALS? (YES / NO)			
Email Invoice to (will default to PM if no other addresses ar			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE/TIME: 3/10/22	DATE/TIME:	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PREservative (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	1302_MW200_220929	29/09/22 8:05	W	x2 PFAS Bottles	ALSX2	X								
2	1302_MW211_220929	29/09/22 8:50	W	x2 PFAS Bottles	ALSX2	X								
3	1302_QLND2_220929	29/09/22 9:30	W	x2 PFAS Bottles	ALSX2	X								
4	1302_QC200_220929	29/09/22 8:20	W	x2 PFAS Bottles x1 Green	ALSX3	X								Please Forward to NMI Sydney
5	1302_QC400_220929	29/09/22 8:30	W	x2 PFAS Bottles	ALSX2	X								
6	1302_QCS02_220929	29/09/22 8:30	W	x1 Green	ALSX1	X								
7	1302_MW176_220929	29/09/22 9:05	W	x2 PFAS Bottles	ALSX2	X								
8	1302_MW103_220929	29/09/22 9:30	W	x2 PFAS Bottles	ALSX2	X								
9	1302_MW102_220929	29/09/22 9:20	W	x2 PFAS Bottles	ALSX2	X								
10	1302_MW215_220929	29/09/22 10:00	W	x2 PFAS Bottles	ALSX2	X								
11	1302_MW100_220929	29/09/22 11:50	W	x2 PFAS Bottles	ALSX2	X								
					29									

Environmental Division Sydney
Work Order Reference
ES2235227

Telephone : +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

[redacted]

FOR 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 comment:			

SEQUENCE NUMBER (Circle) 1 2 3 4 5 6 7
2 3 4 5 6 7

D BY:	RELINQUISHED BY:	RECEIVED BY:
E:	DATE/TIME:	DATE/TIME:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
12	1302_[illegible]_220929	29/09/22 11.50	W	x2 PFAS Bottles	AGSx2	X								
—	1302_[illegible]_220929	29/09/22 11.50	W	x2 PFAS Bottles x1 grab	AGSx3	X								125:SE F-MWXXX TM(N) AXTB4 QC supplied
13	1302_MW303_220929	29/09/22 12.20	W	x2 PFAS Bottles	AGSx2	X								
14	1302_MW152_220929	29/09/22 12.40	W	x2 PFAS Bottles	AGSx2	X								
15	1302_MW297_220929	29/09/22 13.05	W	x2 PFAS Bottles	AGSx2	X								
16	1302_MW139_220929	29/09/22 13.30	W	x2 PFAS Bottles	AGSx2	X								
17	1302_MW255_220929	29/09/22 13.55	W	x2 PFAS Bottles	AGSx2	X								
18	1302_MW454_220929	29/09/22 14.05	W	x2 PFAS Bottles	AGSx2	X								
19	1302_MW144_220929	29/09/22 14.20	W	x2 PFAS Bottles	AGSx2	X								
					19									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

[redacted]

JENCE NUMBER (Circle)	3 4 5 6 7
	3 4 5 6 7

FOR 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 comment:			

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

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
20	1302_MW210_220928	28/09/22	W	x2 PFAS bottles	4ISx2	X								
21	1302_MW156_220928	28/09/22	W	x 2 PFAS Bottles	4ISx2	X								
22	1302_MW112_220928	28/09/22	W	x 2 PFAS Bottles	4ISx2	X								
23	1302_MW205_220928	28/09/22	W	x 2 PFAS Bottles	4ISx2	X								
24	1302_MW195_220928	28/09/22	W	x2 PFAS Bottles	4ISx2	X								
25	1302_QC100_220928	28/09/22	W	x 2 PFAS Bottles	4ISx2	X								
—	1302_QC200_220928	28/09/22	W	x2 PFAS Bottles	4ISx2	X								Please forward to ADM
26	1302_MW190_220928	28/09/22	W	x2 PFAS Bottles	4ISx2	X								
27	1302_MW196_220928	29/09/22	W	x 2 PFAS Bottles	4ISx2	X								
28	1302_MW191_220928	28/09/22	W	x 2 PFAS Bottles	4ISx2	X								
29	1302_MW182_220928	28/09/22	W	x2 PFAS Bottles	4ISx2	X								
30	1302_MW209_220928	28/09/22	W	x2 PFAS Bottles	4ISx2	X								
					26									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

CLIENT: AECOM	TURNAROUND REQUIREMENTS : ☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE:	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
[redacted]	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	Free ice / frozen ice bricks present upon receipt? Yes No N/A
		Random Sample Temperature on Receipt: °C
		Other comment:
	RECEIVED BY: DATE/TIME:	RELINQUISHED BY: DATE/TIME:
		RECEIVED BY: DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC260s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
31	1302_QC102_220928	28/09/22 13:56	W	x2 PFAS Bottles x1 x1	4 2	X								
—	1302_QC202_220928	28/09/22 13:56	W	x 2 PFAS Bottles x1 green	AGx2	X								PLEASE FORWARD TO NMI EXTRA LAB QC included
32	1302_QC302_220928	28/09/22 11:56	W	x2 PFAS Bottles	ALSx2	X								
33	1302_QC402_220928	28/09/22 11:56	W	x2 PFAS Bottles	ALSx2	X								
34	1302_QC502_220928	28/09/22 11:56	W	x1 PFAS Bottles	ALSx1	X								
35	1302_MW120_220928	28/09/22 12:32	W	x2 PFAS Bottles	ALSx2	X								
36	1302_MW151_220928	28/09/22 12:55	W	x2 PFAS Bottles	ALSx2	X								
37	1302_MW148_220928	28/09/22 13:05	W	x2 PFAS Bottles	ALSx2	X								
38	1302_MW452_220928	28/09/22 13:20	W	x2 PFAS Bottles	ALSx2	X								
39	1302_QC102_220928	28/09/22 13:20	W	x2 PFAS Bottles	ALSx2	X								
—	1302_QC202_220928	28/09/22 13:20	W	x2 PFAS Bottles x1 green	ALSx3	X								PLEASE FORWARD TO NMI EXTRA QC included
40	1302_MW180_220928	28/09/22 13:30	W	x2 PFAS Bottles	ALSx2	X								
					25									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

18.10

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: samples.townsville@alsglobal.com

MACKAY 78 Harbour Road Hazelmere QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

ORANGE 1/10 Kite Close Orange NSW 2800 Ph: 02 6364 9990 E: orange@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: samples.townsville@alsglobal.com

WOLLONGONG 99 Kenny Street Port Kembla NSW 2505 Ph: 02 4225 3125 E: samples.wollongong@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	X Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: Darwin		Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: NT_1302_PFASOMP	ALS QUOTE NO.: SY/139/19 V3	COC SEQUENCE NUMBER (Circle)	Free Ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: 60612561/4.1		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MAN [redacted]	CONTACT PH: 0499333601	OF: 1 2 3 4 5 6 7	Other comment:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
AECOM - PH			Kim
DATE/TIME: 10/10/2022	DATE/TIME:	DATE/TIME:	DATE/TIME: 12.10.22 10am

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X	Leachate - ASLP	Asbestos A/P - EA200G	P-30/4 EPA 1828.2 Table 3 Suite	TRH/BTEXN/Metals	TRH/TPH - Trip Blank		HOLD	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	1302_MW112_221010	10/10/2022	W	2 x PFAS	1	X								
2	1302_MW128_221010	10/10/2022	W	2 x PFAS	1	X								
3	1302_QC100_221010	10/10/2022	W	2 x PFAS	1	X								
-	1302_QC200_221010	10/10/2022	W	2 x PFAS	1	X								
4	1302_QC300_221010	10/10/2022	W	2 x PFAS	1	X								PLS FWD TO NMI FOR ANALYSIS
5	1302_QC400_221010	10/10/2022	W	2 x PFAS	1	X								
6	1302_QC500_221010	10/10/2022	W	1 x PFAS	1	X								

LAB OF ORIGIN: DARWIN

Subcon [Forward Lab] Split WO
Lab / Address
Organised By Date NMT
Relinquished By Date 6/10/22
Courier Courier
WO No. ES2236478
Attach by PO Internal Sheet

Environmental Division Sydney
Work Order Reference
ES2236478

Telephone : +61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5699 E: gladstone@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 24 Woolstar Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobe.com
MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.nmi@alsglobal.com
NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
LINDAVIA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobe.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobe.com
TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: contact@alsglobal.com

CLIENT: AECOM	**TURNAROUND REQUIREMENTS :** ☒ Standard TAT (List due date):	**FOR LABORATORY USE ONLY (Circle)**
OFFICE: Darwin	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: NT_1302_PFASOMP	**ALS QUOTE NO.:** SY/139/19 V3	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: 60612561 / 4.1	**COC SEQUENCE NUMBER (Circle)** COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
[redacted]		Other comment:

COC emailed to ALS? (YES / NO) **EDD FORMAT (or default):**	[redacted]
Email Reports to (will default to PM if no other addresses are listed): **james.guzman@aecom.com; poppy.harding1@aecom.com; mat.jenkins@aecom.com; derp.labreports@esdat.com;** DATE/TIME:	
Email Invoice to (will default to PM if no other addresses are listed): **ap_customerservice.anz@aecom.com**	

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								
1	1302_MW133_221021	21/10/22-730	W	2x PFAS	2	X								
2	1302_QC200_221021	21/10/22-830	W	2x PFAS	2	X								
3	1302_QC400_221021	21/10/22-930	W	2x PFAS	2	X								

LAB OF ORIGIN: DARWIN

Environmental Division Sydney
Work Order Reference
ES2238035

Telephone : + 61-2-8784 8555

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Approved Date: 29/11/2019

SYD - SMITHF@

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5690 E: gladstone@alsglobal.com

MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com

MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 0735 E: mudgee.mail@alsglobal.com

NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

[redacted]

FOR 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 comment:

RELINQUISHED BY:

DATE/TIME:

RECEIVED BY:

DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X	Suspended Solids - EA025H	Cations/ Anions - NT-01&02A	TRH/BTEXN/8 metals - W-05	8 Dissolved Metals - W-02	Additional metal (Fe) - EG020	MNA - W-28	Explosives - EP203SL	Tributyltin	VOC trip blank - W18	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	1302_SW06_220630	30-06-22	W	2 x PFAS	3	X										
	1302-BC106-220630	"	W	2 x PFAS	2	X										
	1302_BC200_220630	"	W	"	2	X										RESULTS TO ALS MELB.
	1302_BC400_220630	"	W	"	2	X										
	1302_BC500_220630	"	W	"	2	X										
			W													
			W													
			W													
			W													
			W													
			W													
			W													
TOTAL																

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag

Appendix F

Laboratory Certificates

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM2212650**

Client	: [redacted]	Laboratory	: [redacted]
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: +[redacted]
Facsimile	: ----	Facsimile	: +[redacted]
Project	: NT_1302_PFASOMP	Page	: 1 of 3
Order number	: 60612561/4.1	Quote number	: ES2020AECOMAU0040 (SY/478/20 v3)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: [redacted]		

Dates

Date Samples Received	: 01-Jul-2022 10:45	Issue Date	: 04-Jul-2022
Client Requested Due Date	: 08-Jul-2022	Scheduled Reporting Date	: **08-Jul-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 1	Temperature	: 10.6°C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

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 direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **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)
EM2212650-001	30-Jun-2022 00:00	1302_QC200_220630	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EM2212650**	Page	: 1 of 5
Client	: [redacted]	Laboratory	: Environmental Division Melbourne
Contact	: [redacted]		
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 01-Jul-2022 10:45
Order number	: 60612561/4.1	Date Analysis Commenced	: 05-Jul-2022
C-O-C number	: ----	Issue Date	: 07-Jul-2022 12:34
Sampler	: [redacted]		
Site	: ----		
Quote number	: SY/478/20 v3		
No. of samples received	: 1		
No. of samples analysed	: 1		

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*
[redacted]		

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.
- 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: WATER (Matrix: WATER)				Sample ID	1302_QC200_220630	----	----	----	----
				Sampling date / time	30-Jun-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2212650-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.04**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.04**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.27**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.50**	----	----	----	----
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		**0.06**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.02**	----	----	----	----
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: WATER (Matrix: WATER)				Sample ID	1302_QC200_220630	----	----	----	----
				Sampling date / time	30-Jun-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2212650-001	--------	--------	--------	--------
					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		**0.93**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.77**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.89**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	----	----	----	----
13C8-PFOA	----	0.02	%		**99.2**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EM2212650**	Page	: 1 of 4
Client	[redacted]		
Project	: NT_1302_PFASOMP	Date Samples Received	: 01-Jul-2022
Order number	: 60612561/4.1	Date Analysis Commenced	: 05-Jul-2022
C-O-C number	: ----	Issue Date	: 07-Jul-2022
Sampler	: [redacted]		
Quote number	: SY/478/20 v3		
No. of samples received	: 1		
No. of samples analysed	: 1		

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*
[redacted]		

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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4438941)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.222 µg/L	98.9	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.235 µg/L	106	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.228 µg/L	101	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	101	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	111	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4438941)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	105	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	94.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	104	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	101	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	96.1	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	106	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.8	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	95.7	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	103	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4438941)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	97.9	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	105	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	111	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	101	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	92.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4438941)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.234 µg/L	108	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.238 µg/L	100	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

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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4438941) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.242 µg/L	97.4	70.0	130
EP231P: PFAS Sums (QCLot: 4438941)								
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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order : EM2212650 Page : 1 of 4

Client [redacted]

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

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

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	0	20	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	20	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* ***Date extracted***	*Due for extraction*	*Evaluation*	*Analysis* ***Date analysed***	*Due for analysis*	*Evaluation*
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1302_QC200_220630	**30-Jun-2022**	**05-Jul-2022**	27-Dec-2022	✓	**05-Jul-2022**	27-Dec-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 1302_QC200_220630	**30-Jun-2022**	**05-Jul-2022**	27-Dec-2022	✓	**05-Jul-2022**	27-Dec-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 1302_QC200_220630	**30-Jun-2022**	**05-Jul-2022**	27-Dec-2022	✓	**05-Jul-2022**	27-Dec-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1302_QC200_220630	**30-Jun-2022**	**05-Jul-2022**	27-Dec-2022	✓	**05-Jul-2022**	27-Dec-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 1302_QC200_220630	**30-Jun-2022**	**05-Jul-2022**	27-Dec-2022	✓	**05-Jul-2022**	27-Dec-2022	✓

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	20	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	20	**0.00**	**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
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	: **ES2222496**		
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]		2[redacted]
E-mail	: [redacted]	E-mail	[redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: +[redacted]
Project	: NT_1302_PFASOMP	Page	: 1 of 3
Order number	: 60612561	Quote number	: ES2020AECOMAU0040 (SY/478/20 v3)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: [redacted]		

Dates

Date Samples Received	: 01-Jul-2022 08:00	Issue Date	: 12-Jul-2022
Client Requested Due Date	: 08-Jul-2022	Scheduled Reporting Date	: **08-Jul-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 11.4' C SYD
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
- **Sample 1302_QC200_220630 sent to ALS Melbourne for analysis.**
- **(12/07/2022) This is an updated SRN which reflects a change in ID for sample 001.**
- **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 direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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

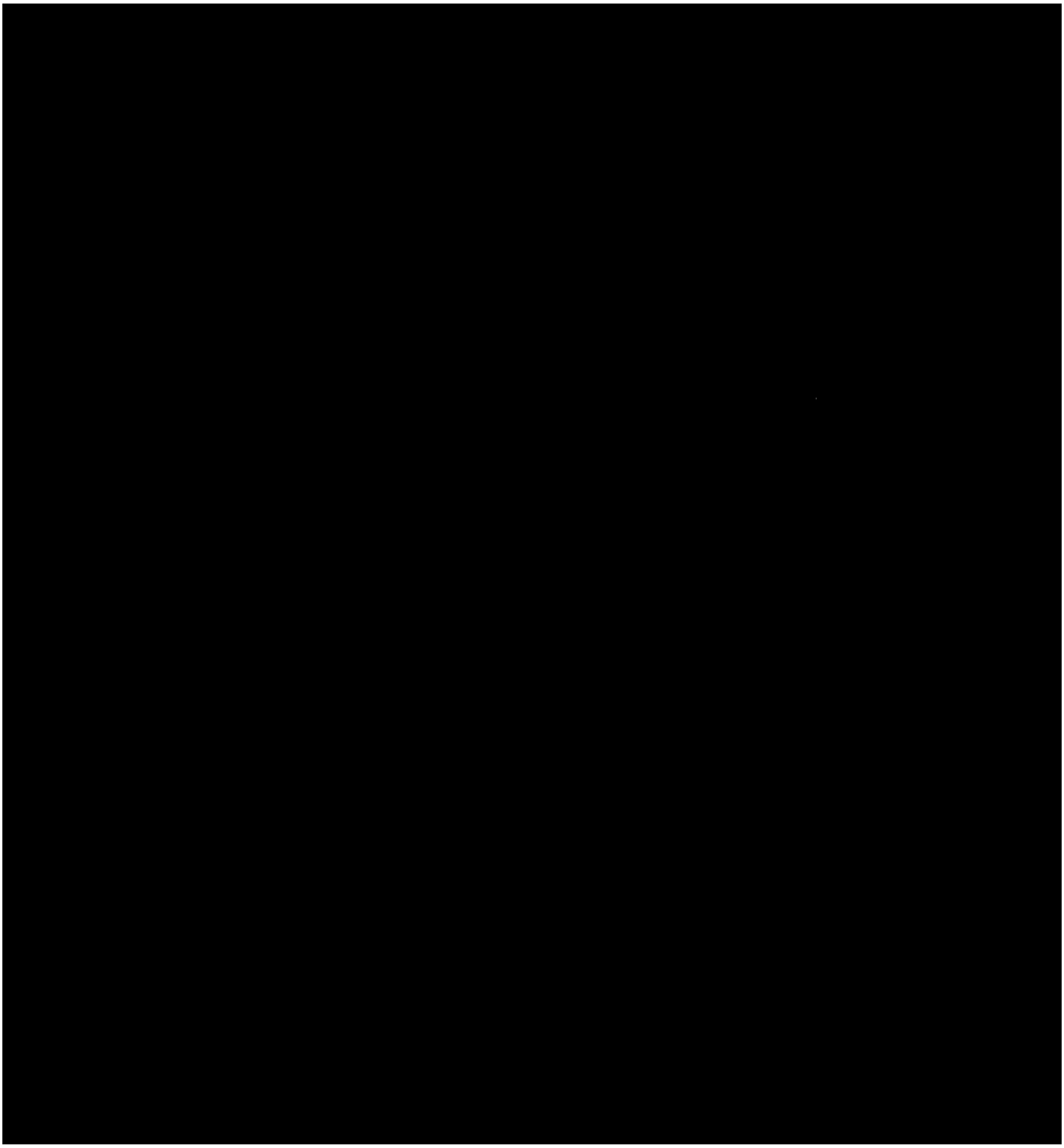
Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X PFAS - Full Suite (28 analytes)
ES2222496-001	30-Jun-2022 00:00	1302_SW109_220630	✓
ES2222496-002	30-Jun-2022 00:00	1302_QC100_220630	✓
ES2222496-003	30-Jun-2022 00:00	1302_QC400_220630	✓
ES2222496-004	30-Jun-2022 00:00	1302_QC500_220630	✓

Proactive Holding Time Report

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

Requested Deliverables



ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2222496**	Page	: 1 of 5
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	[redacted]	Contact	: [redacted]
Address	[redacted]		[redacted]
Telephone	: ----	Telephone	[redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 01-Jul-2022 08:00
Order number	: 60612561	Date Analysis Commenced	: 04-Jul-2022
C-O-C number	: ----	Issue Date	: 12-Jul-2022 13:45
Sampler	[redacted]		
Site	: ----		
Quote number	: SY/478/20 v3		
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*
[redacted]		

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.
- EP231X: Matrix spike recoveries could not be determined due to samples being diluted outside of analytical range.
- Amendment (12/07/2022): This report has been amended to allow a change in ID for sample 001. All analysis results are as per the previous report.
- 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: WATER (Matrix: WATER)				Sample ID	1302_SW109_220630	1302_QC100_220630	1302_QC400_220630	1302_QC500_220630	----
				Sampling date / time	30-Jun-2022 00:00	30-Jun-2022 00:00	30-Jun-2022 00:00	30-Jun-2022 00:00	----
Compound	CAS Number	LOR	Unit		ES2222496-001	ES2222496-002	ES2222496-003	ES2222496-004	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.04**	**0.04**	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.04**	**0.04**	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.35**	**0.33**	<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		**0.64**	**0.58**	<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		**0.09**	**0.07**	<0.02	<0.02	----
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		**0.02**	**0.02**	<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	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW109_220630	1302_QC100_220630	1302_QC400_220630	1302_QC500_220630	----
				Sampling date / time	30-Jun-2022 00:00	30-Jun-2022 00:00	30-Jun-2022 00:00	30-Jun-2022 00:00	----
Compound	CAS Number	LOR	Unit		ES2222496-001	ES2222496-002	ES2222496-003	ES2222496-004	--------
					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	----
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	----
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		**1.20**	**1.10**	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.99**	**0.91**	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.14**	**1.04**	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.0**	**103**	**107**	**105**	----
13C8-PFOA	----	0.02	%		**97.6**	**95.4**	**102**	**94.6**	----

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2222496**	Page	: 1 of 7
Amendment	[redacted]		

[redacted]

Site	: ----
Quote number	: SY/478/20 v3
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*
[redacted]		

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 (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4441292)									
ES2223020-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1280	1540	18.5	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	3470	4090	16.3	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	225	268	17.3	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	214	244	12.9	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	188	214	12.4	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<5.00	<5.00	0.0	No Limit
ES2223020-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1320	1280	3.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	4910	4740	3.5	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	229	220	4.0	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	217	214	1.4	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	220	214	3.0	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<5.00	<5.00	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4441292)									
ES2223020-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1290	1510	15.3	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	649	772	17.3	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	3850	4630	18.5	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	712	868	19.8	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	132	151	13.1	0% - 20%
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	9.00	10.0	10.5	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<5.00	<5.00	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<5.00	<5.00	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<5.00	<5.00	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<12.5	<12.5	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	308	368	17.6	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 (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4441292) - continued									
ES2223020-003	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	1360	1270	6.4	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	679	635	6.7	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	4050	3850	5.1	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	786	734	7.0	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	146	146	0.7	0% - 20%
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	17.5	16.5	5.9	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<5.00	<5.00	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<5.00	<5.00	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<5.00	<5.00	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<12.5	<12.5	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	324	314	3.3	0% - 50%
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4441292)									
ES2223020-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<5.00	<5.00	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<5.00	<5.00	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<5.00	<5.00	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<12.5	<12.5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<12.5	<12.5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<12.5	<12.5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<12.5	<12.5	0.0	No Limit
ES2223020-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<5.00	<5.00	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<5.00	<5.00	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<5.00	<5.00	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<12.5	<12.5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<12.5	<12.5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<12.5	<12.5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<12.5	<12.5	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4441292)									
ES2223020-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<5.00	<5.00	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: 4441292) - continued									
ES2223020-001	Anonymous	EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	216	263	19.4	0% - 20%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	79.5	84.0	5.5	0% - 50%
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<5.00	<5.00	0.0	No Limit
ES2223020-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<5.00	<5.00	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	238	222	6.5	0% - 20%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	141	136	4.0	0% - 20%
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<5.00	<5.00	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4441292)									
ES2223020-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	12600	15000	17.3	0% - 20%
ES2223020-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	14600	14000	4.5	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4441292)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	114	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	118	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	115	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	121	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	114	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	90.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4441292)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	116	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	115	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	116	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	118	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	122	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	115	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	123	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	108	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	115	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4441292)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	127	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	112	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	120	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	117	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	116	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	124	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	115	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4441292)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	123	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	123	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	122	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: 4441292) - continued								
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

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4441292)							
ES2223020-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	# Not Determined	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	# Not Determined	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	# Not Determined	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	# 0.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4441292)							
ES2223020-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	# Not Determined	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	# Not Determined	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	# Not Determined	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	# Not Determined	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	# Not Determined	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	# 0.0	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	# 0.0	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	# 0.0	65.0	144

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: 4441292) - continued							
ES2223020-002	Anonymous	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	# 0.0	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4441292)							
ES2223020-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	# Not Determined	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	# 0.0	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	# 0.0	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	# 0.0	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	# 0.0	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	# 0.0	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	# 0.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4441292)							
ES2223020-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	# 0.0	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	# Not Determined	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	# 0.0	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2222496**	Page	: 1 of 6
Amendment	: **1**		
Client	[redacted]		
Contact			
Project			
Site			
Sampler			
Order number	: 60612561	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.**
- **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

- **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							
EP231A: Perfluoroalkyl Sulfonic Acids	ES2223020--002	Anonymous	**Perfluorobutane sulfonic acid (PFBS)**	375-73-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	ES2223020--002	Anonymous	**Perfluoropentane sulfonic acid (PFPeS)**	2706-91-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	ES2223020--002	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	ES2223020--002	Anonymous	**Perfluoroheptane sulfonic acid (PFHpS)**	375-92-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	ES2223020--002	Anonymous	**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	ES2223020--002	Anonymous	**Perfluorodecane sulfonic acid (PFDS)**	335-77-3	0.0 %	53.0-142%	**Recovery less than lower data quality objective**
EP231B: Perfluoroalkyl Carboxylic Acids	ES2223020--002	Anonymous	**Perfluorobutanoic acid (PFBA)**	375-22-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	ES2223020--002	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	ES2223020--002	Anonymous	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	ES2223020--002	Anonymous	**Perfluoroheptanoic acid (PFHpA)**	375-85-9	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	ES2223020--002	Anonymous	**Perfluorooctanoic acid (PFOA)**	335-67-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	ES2223020--002	Anonymous	**Perfluorononanoic acid (PFNA)**	375-95-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	ES2223020--002	Anonymous	**Perfluorodecanoic acid (PFDA)**	335-76-2	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	ES2223020--002	Anonymous	**Perfluoroundecanoic acid (PFUnDA)**	2058-94-8	0.0 %	69.0-133%	**Recovery less than lower data quality objective**

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries - Continued							
EP231B: Perfluoroalkyl Carboxylic Acids	ES2223020--002	Anonymous	**Perfluorododecanoic acid (PFDoDA)**	307-55-1	0.0 %	72.0-134%	**Recovery less than lower data quality objective**
EP231B: Perfluoroalkyl Carboxylic Acids	ES2223020--002	Anonymous	**Perfluorotridecanoic acid (PFTrDA)**	72629-94-8	0.0 %	65.0-144%	**Recovery less than lower data quality objective**
EP231B: Perfluoroalkyl Carboxylic Acids	ES2223020--002	Anonymous	**Perfluorotetradecanoic acid (PFTeDA)**	376-06-7	0.0 %	71.0-132%	**Recovery less than lower data quality objective**
EP231C: Perfluoroalkyl Sulfonamides	ES2223020--002	Anonymous	**Perfluorooctane sulfonamide (FOSA)**	754-91-6	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231C: Perfluoroalkyl Sulfonamides	ES2223020--002	Anonymous	**N-Methyl perfluorooctane sulfonamide (MeFOSA)**	31506-32-8	0.0 %	68.0-141%	**Recovery less than lower data quality objective**
EP231C: Perfluoroalkyl Sulfonamides	ES2223020--002	Anonymous	**N-Ethyl perfluorooctane sulfonamide (EtFOSA)**	4151-50-2	0.0 %	62.6-147%	**Recovery less than lower data quality objective**
EP231C: Perfluoroalkyl Sulfonamides	ES2223020--002	Anonymous	**N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)**	24448-09-7	0.0 %	66.0-145%	**Recovery less than lower data quality objective**
EP231C: Perfluoroalkyl Sulfonamides	ES2223020--002	Anonymous	**N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)**	1691-99-2	0.0 %	57.6-145%	**Recovery less than lower data quality objective**
EP231C: Perfluoroalkyl Sulfonamides	ES2223020--002	Anonymous	**N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)**	2355-31-9	0.0 %	65.0-136%	**Recovery less than lower data quality objective**
EP231C: Perfluoroalkyl Sulfonamides	ES2223020--002	Anonymous	**N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)**	2991-50-6	0.0 %	61.0-135%	**Recovery less than lower data quality objective**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	ES2223020--002	Anonymous	**4:2 Fluorotelomer sulfonic acid (4:2 FTS)**	757124-72-4	0.0 %	63.0-143%	**Recovery less than lower data quality objective**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	ES2223020--002	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.**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	ES2223020--002	Anonymous	**8:2 Fluorotelomer sulfonic acid (8:2 FTS)**	39108-34-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	ES2223020--002	Anonymous	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	0.0 %	71.4-144%	**Recovery less than lower data quality objective**

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
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
1302_SW109_220630,	1302_QC100_220630,	**30-Jun-2022**	**06-Jul-2022**	27-Dec-2022	✓	**07-Jul-2022**	27-Dec-2022	✓
1302_QC400_220630,	1302_QC500_220630							
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
1302_SW109_220630,	1302_QC100_220630,	**30-Jun-2022**	**06-Jul-2022**	27-Dec-2022	✓	**07-Jul-2022**	27-Dec-2022	✓
1302_QC400_220630,	1302_QC500_220630							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
1302_SW109_220630,	1302_QC100_220630,	**30-Jun-2022**	**06-Jul-2022**	27-Dec-2022	✓	**07-Jul-2022**	27-Dec-2022	✓
1302_QC400_220630,	1302_QC500_220630							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
1302_SW109_220630,	1302_QC100_220630,	**30-Jun-2022**	**06-Jul-2022**	27-Dec-2022	✓	**07-Jul-2022**	27-Dec-2022	✓
1302_QC400_220630,	1302_QC500_220630							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
1302_SW109_220630,	1302_QC100_220630,	**30-Jun-2022**	**06-Jul-2022**	27-Dec-2022	✓	**07-Jul-2022**	27-Dec-2022	✓
1302_QC400_220630,	1302_QC500_220630							

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)							
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
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 : **ES2230718**

[redacted]

Dates

Date Samples Received	: 30-Aug-2022 07:00	Issue Date	: 30-Aug-2022
Client Requested Due Date	: 06-Sep-2022	Scheduled Reporting Date	: **06-Sep-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 4.0' C SYD - 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
- **Sample 1302_QC200_220826 forwarded to NMI for analysis.**
- **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 direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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)
ES2230718-001	26-Aug-2022 00:00	1302_SW109_220826	✓
ES2230718-002	26-Aug-2022 00:00	1302_QC100_220826	✓
ES2230718-003	26-Aug-2022 00:00	1302_QC400_220826	✓
ES2230718-004	26-Aug-2022 00:00	1302_QC500_220826	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2230718**	Page	: 1 of 5
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: 60667360	Date Samples Received	: 30-Aug-2022 07:00
Order number	: 60667360	Date Analysis Commenced	: 30-Aug-2022
C-O-C number	: ----	Issue Date	: 05-Sep-2022 09:11
Sampler	: [redacted]		
Site	: ----		
Quote number	: EN/004/21		
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*
[redacted]		

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.
- 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: WATER (Matrix: WATER)				Sample ID	1302_SW109_220826	1302_QC100_220826	1302_QC400_220826	1302_QC500_220826	----
				Sampling date / time	26-Aug-2022 00:00	26-Aug-2022 00:00	26-Aug-2022 00:00	26-Aug-2022 00:00	----
Compound	CAS Number	LOR	Unit		ES2230718-001	ES2230718-002	ES2230718-003	ES2230718-004	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.06**	**0.07**	<0.02	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.10**	**0.10**	<0.02	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.74**	**0.80**	<0.01	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.04**	**0.04**	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.03**	**1.06**	<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		**0.03**	**0.03**	<0.02	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.11**	**0.12**	<0.02	<0.02	----
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		**0.04**	**0.04**	<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	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW109_220826	1302_QC100_220826	1302_QC400_220826	1302_QC500_220826	----
				Sampling date / time	26-Aug-2022 00:00	26-Aug-2022 00:00	26-Aug-2022 00:00	26-Aug-2022 00:00	----
Compound	CAS Number	LOR	Unit		ES2230718-001	ES2230718-002	ES2230718-003	ES2230718-004	--------
					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	----
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	----
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		**2.15**	**2.26**	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.77**	**1.86**	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**2.01**	**2.12**	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	**94.1**	**109**	**105**	----
13C8-PFOA	----	0.02	%		**103**	**98.7**	**103**	**99.9**	----

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2230718**	Page	: 1 of 7
Client	[redacted]		
Contact			
Address			
Telephone			
Project			
Order number			
C-O-C number			
Sampler			
Site	: ----		
Quote number	: EN/004/21		
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*
[redacted]		

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 (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4552941)									
EM2216483-008	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.17	0.18	0.0	0% - 50%
		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
ES2230132-001	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: 4552941)									
EM2216483-008	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

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: 4552941) - continued									
ES2230132-001	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: 4552941)									
EM2216483-008	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
ES2230132-001	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: 4552941)									
EM2216483-008	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

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: 4552941) - continued									
EM2216483-008	Anonymous	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
ES2230132-001	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: 4552941)									
EM2216483-008	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.22	0.23	4.4	0% - 20%
ES2230132-001	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4552941)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	83.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	96.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	94.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	96.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	90.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4552941)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	88.2	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	93.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	105	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	88.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	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	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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4552941)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	97.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	105	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	88.6	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	114	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	95.8	57.6	145
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	98.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4552941)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	95.6	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	95.4	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	112	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: 4552941) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	95.0	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4552941)							
EM2216483-011	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	93.2	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	112	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	99.6	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	89.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4552941)							
EM2216483-011	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	95.7	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	97.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	101	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	101	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	93.0	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	88.2	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	97.4	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	101	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	104	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	112	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4552941)							
EM2216483-011	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	103	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	105	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	88.7	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	116	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	97.9	57.6	145

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: 4552941) - continued							
EM2216483-011	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	108	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4552941)							
EM2216483-011	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	93.8	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	104	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	103	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	91.6	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2230718**	Page	: 1 of 4
Client	[redacted]		
Contact			
Project			
Site			
Sampler			
Order number			

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

- **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							
EP231A: Perfluoroalkyl Sulfonic Acids	EM2216483--011	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	EM2216483--011	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

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
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
1302_SW109_220826, 1302_QC400_220826,	1302_QC100_220826, 1302_QC500_220826	**26-Aug-2022**	**01-Sep-2022**	22-Feb-2023	✓	**02-Sep-2022**	22-Feb-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
1302_SW109_220826, 1302_QC400_220826,	1302_QC100_220826, 1302_QC500_220826	**26-Aug-2022**	**01-Sep-2022**	22-Feb-2023	✓	**02-Sep-2022**	22-Feb-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
1302_SW109_220826, 1302_QC400_220826,	1302_QC100_220826, 1302_QC500_220826	**26-Aug-2022**	**01-Sep-2022**	22-Feb-2023	✓	**02-Sep-2022**	22-Feb-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
1302_SW109_220826, 1302_QC400_220826,	1302_QC100_220826, 1302_QC500_220826	**26-Aug-2022**	**01-Sep-2022**	22-Feb-2023	✓	**02-Sep-2022**	22-Feb-2023	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
1302_SW109_220826, 1302_QC400_220826,	1302_QC100_220826, 1302_QC500_220826	**26-Aug-2022**	**01-Sep-2022**	22-Feb-2023	✓	**02-Sep-2022**	22-Feb-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)							
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
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 : **ES2236478**

Client	[redacted]
Contact	
Address	
E-mail	
Telephone	
Facsimile	
Project	
Order number	
C-O-C number	
Site	
Sampler	

Dates

Date Samples Received	: 12-Oct-2022 08:30	Issue Date	: 12-Oct-2022
Client Requested Due Date	: 18-Oct-2022	Scheduled Reporting Date	: **18-Oct-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: 18.0' C SYD
Receipt Detail	:	No. of samples received / analysed	: 6 / 6

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 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 direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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)
ES2236478-001	10-Oct-2022 00:00	1302_MW112_221010	✓
ES2236478-002	10-Oct-2022 00:00	1302_MW128_221010	✓
ES2236478-003	10-Oct-2022 00:00	1302_QC100_221010	✓
ES2236478-004	10-Oct-2022 00:00	1302_QC300_221010	✓
ES2236478-005	10-Oct-2022 00:00	1302_QC400_221010	✓
ES2236478-006	10-Oct-2022 00:00	1302_QC500_221010	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

[redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2236478**	Page	: 1 of 7

[redacted]

Site	: ----
Quote number	: SY/139/19 V3
No. of samples received	: 6
No. of samples analysed	: 6

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*

[redacted]

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.
- 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: WATER (Matrix: WATER)				Sample ID	1302_MW112_221010	1302_MW128_221010	1302_QC100_221010	1302_QC300_221010	1302_QC400_221010
				Sampling date / time	10-Oct-2022 00:00	10-Oct-2022 00:00	10-Oct-2022 00:00	10-Oct-2022 00:00	10-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		ES2236478-001	ES2236478-002	ES2236478-003	ES2236478-004	ES2236478-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.34**	**0.24**	**0.35**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.35**	**0.27**	**0.37**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**3.13**	**2.63**	**3.18**	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.27**	**0.16**	**0.27**	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**14.8**	**6.48**	**14.4**	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		**0.03**	<0.02	**0.04**	<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		**0.16**	**0.14**	**0.17**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.86**	**0.56**	**0.90**	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.11**	**0.08**	**0.12**	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.29**	**0.19**	**0.25**	<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		**0.04**	<0.02	**0.04**	<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: WATER (Matrix: WATER)				Sample ID	1302_MW112_221010	1302_MW128_221010	1302_QC100_221010	1302_QC300_221010	1302_QC400_221010
				Sampling date / time	10-Oct-2022 00:00	10-Oct-2022 00:00	10-Oct-2022 00:00	10-Oct-2022 00:00	10-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		ES2236478-001	ES2236478-002	ES2236478-003	ES2236478-004	ES2236478-005
					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		**20.4**	**10.8**	**20.1**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**17.9**	**9.11**	**17.6**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**19.7**	**10.3**	**19.4**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**91.0**	**104**	**92.2**	**111**	**111**
13C8-PFOA	----	0.02	%		**105**	**110**	**104**	**112**	**107**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC500_221010	----	----	----	----
				Sampling date / time	10-Oct-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2236478-006	--------	--------	--------	--------
					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: WATER (Matrix: WATER)				Sample ID	1302_QC500_221010	----	----	----	----
				Sampling date / time	10-Oct-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2236478-006	--------	--------	--------	--------
					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	%		**109**	----	----	----	----
13C8-PFOA	----	0.02	%		**110**	----	----	----	----

Surrogate Control Limits

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

QUALITY CONTROL REPORT

Work Order	: **ES2236478**	Page	: 1 of 7
Client	[redacted]		
Contact			
Address			
Telephone			
Project			
Order number			
C-O-C number			
Sampler			
Site	: ----		
Quote number	: SY/139/19 V3		
No. of samples received	: 6		
No. of samples analysed	: 6		

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*
[redacted]		

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 (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4634790)									
EP2213092-002	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.03	0.04	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.08	0.08	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
ES2236306-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	1.88	2.03	7.7	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	1.61	1.68	4.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.07	0.07	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.04	0.05	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: 4634790)									
EP2213092-002	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.02	0.03	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

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: 4634790) - continued									
ES2236306-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.08	0.08	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.58	0.62	6.7	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.37	0.40	7.8	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.39	0.43	8.4	0% - 20%
		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	0.2	0.2	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4634790)									
EP2213092-002	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
ES2236306-001	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: 4634790)									
EP2213092-002	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

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: 4634790) - continued									
EP2213092-002	Anonymous	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
ES2236306-001	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: 4634790)									
EP2213092-002	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.21	0.23	9.1	0% - 20%
ES2236306-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	5.25	5.59	6.3	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4634790)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	90.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	99.2	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	94.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	95.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	94.4	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	93.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4634790)								
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	106	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	105	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	107	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	105	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	97.6	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	106	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4634790)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	84.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	86.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	83.9	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	93.1	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	87.4	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	99.4	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	91.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4634790)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	114	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	117	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	112	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: 4634790) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	116	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4634790)							
EP2213092-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	105	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	117	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	111	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	113	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	109	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4634790)							
EP2213092-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	116	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	107	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	124	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	122	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	117	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	121	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	122	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	112	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	119	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	117	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	122	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4634790)							
EP2213092-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	101	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	86.3	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	87.4	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	96.2	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	103	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	109	65.0	136

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: 4634790) - continued							
EP2213092-003	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	111	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4634790)							
EP2213092-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	104	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	113	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	109	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	116	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Client : [redacted]

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: **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)							
1302_MW112_221010, 1302_MW128_221010, 1302_QC100_221010, 1302_QC300_221010, 1302_QC400_221010, 1302_QC500_221010	**10-Oct-2022**	**13-Oct-2022**	08-Apr-2023	✓	**14-Oct-2022**	08-Apr-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_MW112_221010, 1302_MW128_221010, 1302_QC100_221010, 1302_QC300_221010, 1302_QC400_221010, 1302_QC500_221010	**10-Oct-2022**	**13-Oct-2022**	08-Apr-2023	✓	**14-Oct-2022**	08-Apr-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
1302_MW112_221010, 1302_MW128_221010, 1302_QC100_221010, 1302_QC300_221010, 1302_QC400_221010, 1302_QC500_221010	**10-Oct-2022**	**13-Oct-2022**	08-Apr-2023	✓	**14-Oct-2022**	08-Apr-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_MW112_221010, 1302_MW128_221010, 1302_QC100_221010, 1302_QC300_221010, 1302_QC400_221010, 1302_QC500_221010	**10-Oct-2022**	**13-Oct-2022**	08-Apr-2023	✓	**14-Oct-2022**	08-Apr-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_MW112_221010, 1302_MW128_221010, 1302_QC100_221010, 1302_QC300_221010, 1302_QC400_221010, 1302_QC500_221010	**10-Oct-2022**	**13-Oct-2022**	08-Apr-2023	✓	**14-Oct-2022**	08-Apr-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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	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
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 : **ES2238035**

Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	[redacted]

[redacted]

Dates

Date Samples Received	: 25-Oct-2022 08:30	Issue Date	: 25-Oct-2022
Client Requested Due Date	: 01-Nov-2022	Scheduled Reporting Date	: **01-Nov-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: 25.1'C
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
- **Sample QC200s was not received.**
- **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 direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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)
ES2238035-001	21-Oct-2022 07:30	1302_MW133_221021	✓
ES2238035-002	21-Oct-2022 09:30	1302_QC300_221021	✓
ES2238035-003	21-Oct-2022 09:30	1302_QC400_221021	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2238035**	Page	: 1 of 5
Client	[redacted]		
Quote number	: SY/139/19 V3		
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*
[redacted]		

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.
- 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: WATER (Matrix: WATER)				Sample ID	1302_MW133_221021	1302_QC300_221021	1302_QC400_221021	----	----
				Sampling date / time	21-Oct-2022 07:30	21-Oct-2022 09:30	21-Oct-2022 09:30	----	----
Compound	CAS Number	LOR	Unit		ES2238035-001	ES2238035-002	ES2238035-003	--------	--------
					Result	Result	Result	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.62**	<0.02	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.88**	<0.02	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**8.84**	<0.01	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.96**	<0.02	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**47.2**	<0.01	<0.01	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		**0.03**	<0.02	<0.02	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.2**	<0.1	<0.1	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.49**	<0.02	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**2.79**	<0.02	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.31**	<0.02	<0.02	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.80**	<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		**0.04**	<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	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW133_221021	1302_QC300_221021	1302_QC400_221021	----	----
				Sampling date / time	21-Oct-2022 07:30	21-Oct-2022 09:30	21-Oct-2022 09:30	----	----
Compound	CAS Number	LOR	Unit		ES2238035-001	ES2238035-002	ES2238035-003	--------	--------
					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	----	----
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		**0.14**	<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	----	----
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		**63.4**	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**56.0**	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**61.4**	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**115**	**118**	**118**	----	----
13C8-PFOA	----	0.02	%		**101**	**98.0**	**98.3**	----	----

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2238035**	Page	: 1 of 4
Client	[redacted]		
Quote number	: SY/139/19 V3		
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*
[redacted]		

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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4666831)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	76.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	83.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	77.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	83.2	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	95.6	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	74.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4666831)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	78.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	74.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	81.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	95.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	95.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	97.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	95.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	75.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	109	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	89.8	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4666831)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	74.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	73.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	82.6	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	90.2	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	126	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	79.6	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	87.6	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4666831)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	80.0	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	89.2	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	99.4	67.0	138

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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4666831) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	76.6	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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2238035**	Page	: 1 of 4
Client	[redacted]		
Contact			
Project			
Site			
Sampler			
Order number			

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

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

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	0	3	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	3	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: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_MW133_221021, 1302_QC300_221021, 1302_QC400_221021	**21-Oct-2022**	**28-Oct-2022**	19-Apr-2023	✓	**28-Oct-2022**	19-Apr-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_MW133_221021, 1302_QC300_221021, 1302_QC400_221021	**21-Oct-2022**	**28-Oct-2022**	19-Apr-2023	✓	**28-Oct-2022**	19-Apr-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
1302_MW133_221021, 1302_QC300_221021, 1302_QC400_221021	**21-Oct-2022**	**28-Oct-2022**	19-Apr-2023	✓	**28-Oct-2022**	19-Apr-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_MW133_221021, 1302_QC300_221021, 1302_QC400_221021	**21-Oct-2022**	**28-Oct-2022**	19-Apr-2023	✓	**28-Oct-2022**	19-Apr-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_MW133_221021, 1302_QC300_221021, 1302_QC400_221021	**21-Oct-2022**	**28-Oct-2022**	19-Apr-2023	✓	**28-Oct-2022**	19-Apr-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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	3	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	3	**0.00**	**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
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 : **ES2235227**
Amendment : **1**

[redacted]

Dates

Date Samples Received	: 04-Oct-2022 08:30	Issue Date	: 14-Nov-2022
Client Requested Due Date	: 11-Oct-2022	Scheduled Reporting Date	: **11-Oct-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: ----
Receipt Detail	:	No. of samples received / analysed	: 40 / 35

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
- **Samples #5 '1302_QC400_220929', #22 '1302_MW112_220928', #33 '1302_QC400_2209028' & #35 '1302_MW128_220928' are unable to have PFAS analysis conducted as the containers were received with no volume.**
- **Samples '1302_QC200_220929', 1302_QC201_220929', '1302_QC200_220928', '1302_QC201_220928' & '1302_QC202_220928' have been forwarded to NMI for analysis.**
- **This is an updated SRN to reflect an update in project name to match COC**
- **(14/11/2022) This is an updated SRN which reflects a change in ID for sample 011.**
- **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 direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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	(On Hold) WATER No analysis requested	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - EP231X-INJ PFAS - Full Suite (28 analytes)
ES2235227-001	29-Sep-2022 07:35	1302_MW200_220929		✓	
ES2235227-002	29-Sep-2022 08:00	1302_MW211_220929		✓	
ES2235227-003	29-Sep-2022 08:00	1302_QC100_220929		✓	
ES2235227-004	29-Sep-2022 08:00	1302_QC300_220929			✓
ES2235227-005	29-Sep-2022 08:00	1302_QC400_220929	✓		
ES2235227-006	29-Sep-2022 08:00	1302_QC500_220929		✓	
ES2235227-007	29-Sep-2022 08:30	1302_MW176_220929		✓	
ES2235227-008	29-Sep-2022 09:00	1302_MW103_220929		✓	
ES2235227-009	29-Sep-2022 09:20	1302_MW107_220929		✓	
ES2235227-010	29-Sep-2022 09:30	1302_MW215_220929		✓	
ES2235227-011	29-Sep-2022 11:20	1302_MW141_220929		✓	
ES2235227-012	29-Sep-2022 11:20	1302_QC101_220929		✓	
ES2235227-013	29-Sep-2022 11:50	1302_MW303_220929		✓	
ES2235227-014	29-Sep-2022 12:20	1302_MW133_220929		✓	
ES2235227-015	29-Sep-2022 12:30	1302_MW297_220929		✓	
ES2235227-016	29-Sep-2022 13:00	1302_MW139_220929		✓	
ES2235227-017	29-Sep-2022 13:20	1302_MW235_220929		✓	
ES2235227-018	29-Sep-2022 13:30	1302_MW454_220929		✓	
ES2235227-019	28-Sep-2022 13:50	1302_MW144_220929		✓	
ES2235227-020	28-Sep-2022 06:30	1302_MW210_220928		✓	
ES2235227-021	28-Sep-2022 07:48	1302_MW156_220928			✓
ES2235227-022	28-Sep-2022 08:10	1302_MW112_220928	✓		
ES2235227-023	28-Sep-2022 08:29	1302_MW205_220928		✓	
ES2235227-024	28-Sep-2022 07:08	1302_MW195_220928		✓	
ES2235227-025	28-Sep-2022 08:30	1302_QC100_220928		✓	
ES2235227-026	28-Sep-2022 09:57	1302_MW194_220928		✓	
ES2235227-027	28-Sep-2022 10:16	1302_MW190_220928		✓	
ES2235227-028	28-Sep-2022 10:35	1302_MW191_220928		✓	
ES2235227-029	28-Sep-2022 10:54	1302_MW185_220928		✓	
ES2235227-030	28-Sep-2022 00:00	1302_MW209_220928		✓	
ES2235227-031	28-Sep-2022 11:26	1302_QC101_220928		✓	
ES2235227-032	28-Sep-2022 11:26	1302_QC300_220928		✓	
ES2235227-033	28-Sep-2022 11:26	1302_QC400_220928	✓		
ES2235227-034	28-Sep-2022 11:26	1302_QC500_220928		✓	
ES2235227-035	28-Sep-2022 12:04	1302_MW128_220928	✓		

			(On Hold) WATER No analysis requested	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - EP231X-INJ PFAS - Full Suite (28 analytes)
ES2235227-036	28-Sep-2022 12:25	1302_MW451_220928		✓	
ES2235227-037	28-Sep-2022 12:35	1302_MW148_220928		✓	
ES2235227-038	28-Sep-2022 12:50	1302_MW452_220928		✓	
ES2235227-039	28-Sep-2022 12:50	1302_QC102_220928		✓	
ES2235227-040	29-Sep-2022 07:00	1302_MW180_220929		✓	

Proactive Holding Time Report

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

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2235227**	Page	: 1 of 21
Amendment	[redacted]		

[redacted]

Quote number	: SY/139/19 V3
No. of samples received	: 40
No. of samples analysed	: 35

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*
[redacted]		

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.
- Amendment (14/11/2022): This report has been amended to alter the ID for sample 011. All analysis results are as per the previous report.
- 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.
- EP231X-INJ: The direct injection LCMSMS method may be used where the sample matrix is not suitable for Solid Phase Extraction (e.g. significant particulate load) or where only a single sample container is received.

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW200_220929	1302_MW211_220929	1302_QC100_220929	1302_QC300_220929	1302_QC500_220929
				Sampling date / time	29-Sep-2022 07:35	29-Sep-2022 08:00	29-Sep-2022 08:00	29-Sep-2022 08:00	29-Sep-2022 08:00
					ES2235227-001	ES2235227-002	ES2235227-003	ES2235227-004	ES2235227-006
					Result	Result	Result	Result	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	----
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.08**	<0.02	<0.02	----	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.08**	<0.02	<0.02	----	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.14**	**0.01**	**0.01**	----	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.05**	<0.02	<0.02	----	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.35**	**0.02**	**0.02**	----	<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	0.10	µg/L		----	----	----	<0.10	----
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	----

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW200_220929	1302_MW211_220929	1302_QC100_220929	1302_QC300_220929	1302_QC500_220929
				Sampling date / time	29-Sep-2022 07:35	29-Sep-2022 08:00	29-Sep-2022 08:00	29-Sep-2022 08:00	29-Sep-2022 08:00
					ES2235227-001	ES2235227-002	ES2235227-003	ES2235227-004	ES2235227-006
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		----	----	----	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		----	----	----	<0.05	----
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		**0.03**	<0.02	<0.02	----	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.18**	<0.02	<0.02	----	<0.02
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		**0.04**	<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	----
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	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW200_220929	1302_MW211_220929	1302_QC100_220929	1302_QC300_220929	1302_QC500_220929
				Sampling date / time	29-Sep-2022 07:35	29-Sep-2022 08:00	29-Sep-2022 08:00	29-Sep-2022 08:00	29-Sep-2022 08:00
Compound	CAS Number	LOR	Unit		ES2235227-001	ES2235227-002	ES2235227-003	ES2235227-004	ES2235227-006
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	----
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	----
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
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	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW200_220929	1302_MW211_220929	1302_QC100_220929	1302_QC300_220929	1302_QC500_220929
				Sampling date / time	29-Sep-2022 07:35	29-Sep-2022 08:00	29-Sep-2022 08:00	29-Sep-2022 08:00	29-Sep-2022 08:00
Compound	CAS Number	LOR	Unit		ES2235227-001	ES2235227-002	ES2235227-003	ES2235227-004	ES2235227-006
					Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
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	**----**
Sum of PFAS	----	0.01	µg/L		**2.95**	**0.03**	**0.03**	**----**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**2.49**	**0.03**	**0.03**	**----**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**2.82**	**0.03**	**0.03**	**----**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	**104**	**94.3**	**----**	**102**
13C4-PFOS	----	0.02	%		**----**	**----**	**----**	**103**	**----**
13C8-PFOA	----	0.02	%		**99.5**	**99.6**	**105**	**----**	**103**
13C8-PFOA	----	0.02	%		**----**	**----**	**----**	**96.9**	**----**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW176_220929	1302_MW103_220929	1302_MW107_220929	1302_MW215_220929	1302_MW141_220929
				Sampling date / time	29-Sep-2022 08:30	29-Sep-2022 09:00	29-Sep-2022 09:20	29-Sep-2022 09:30	29-Sep-2022 11:20
					ES2235227-007	ES2235227-008	ES2235227-009	ES2235227-010	ES2235227-011
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.97**	**0.24**	**0.18**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**1.98**	**0.33**	**0.20**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.04**	**19.8**	**2.75**	**1.77**	**0.15**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.90**	**0.20**	**0.14**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.09**	**28.8**	**6.36**	**4.20**	**0.17**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	**0.04**	<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		**0.04**	**0.38**	**0.12**	**0.09**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.05**	**3.95**	**0.67**	**0.35**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.44**	**0.08**	**0.06**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.01**	**1.11**	**0.17**	**0.09**	<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: WATER (Matrix: WATER)				Sample ID	1302_MW176_220929	1302_MW103_220929	1302_MW107_220929	1302_MW215_220929	1302_MW141_220929
				Sampling date / time	29-Sep-2022 08:30	29-Sep-2022 09:00	29-Sep-2022 09:20	29-Sep-2022 09:30	29-Sep-2022 11:20
Compound	CAS Number	LOR	Unit		ES2235227-007	ES2235227-008	ES2235227-009	ES2235227-010	ES2235227-011
					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		**0.23**	**58.5**	**10.9**	**7.08**	**0.32**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.13**	**48.6**	**9.11**	**5.97**	**0.32**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.23**	**55.6**	**10.4**	**6.74**	**0.32**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**106**	**95.6**	**96.7**	**100**
13C8-PFOA	----	0.02	%		**108**	**105**	**105**	**101**	**99.5**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_QC101_220929	1302_MW303_220929	1302_MW133_220929	1302_MW297_220929	1302_MW139_220929
				Sampling date / time	29-Sep-2022 11:20	29-Sep-2022 11:50	29-Sep-2022 12:20	29-Sep-2022 12:30	29-Sep-2022 13:00
					ES2235227-012	ES2235227-013	ES2235227-014	ES2235227-015	ES2235227-016
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.21**	**5.45**	<0.02	**0.92**	**0.06**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.21**	**7.69**	<0.02	**1.08**	**0.07**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.58**	**31.4**	<0.01	**6.62**	**0.49**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.10**	**2.64**	<0.02	**0.82**	**0.04**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**3.04**	**49.9**	**0.01**	**35.2**	**1.45**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	**0.07**	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	**1.1**	<0.1	**0.2**	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.05**	**1.63**	<0.02	**0.29**	**0.02**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.32**	**11.4**	<0.02	**2.16**	**0.12**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.03**	**1.39**	<0.02	**0.34**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.09**	**3.00**	<0.01	**0.75**	**0.04**
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	**0.04**	<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: WATER (Matrix: WATER)				Sample ID	1302_QC101_220929	1302_MW303_220929	1302_MW133_220929	1302_MW297_220929	1302_MW139_220929
				Sampling date / time	29-Sep-2022 11:20	29-Sep-2022 11:50	29-Sep-2022 12:20	29-Sep-2022 12:30	29-Sep-2022 13:00
Compound	CAS Number	LOR	Unit		ES2235227-012	ES2235227-013	ES2235227-014	ES2235227-015	ES2235227-016
					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	**0.10**	<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		**5.63**	**116**	**0.01**	**48.5**	**2.29**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**4.62**	**81.3**	**0.01**	**41.8**	**1.94**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**5.32**	**105**	**0.01**	**46.5**	**2.18**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**97.5**	**102**	**98.2**	**101**	**96.4**
13C8-PFOA	----	0.02	%		**102**	**106**	**96.6**	**96.3**	**101**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW235_220929	1302_MW454_220929	1302_MW144_220929	1302_MW210_220928	1302_MW156_220928
				Sampling date / time	29-Sep-2022 13:20	29-Sep-2022 13:30	28-Sep-2022 13:50	28-Sep-2022 06:30	28-Sep-2022 07:48
					ES2235227-017	ES2235227-018	ES2235227-019	ES2235227-020	ES2235227-021
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		----	----	----	----	**0.17**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		----	----	----	----	**0.16**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		----	----	----	----	**1.43**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		----	----	----	----	**0.08**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		----	----	----	----	**3.33**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		----	----	----	----	<0.02
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.76**	**2.43**	**0.19**	**0.12**	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.81**	**2.75**	**0.19**	**0.08**	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**6.22**	**15.2**	**1.43**	**0.74**	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.44**	**1.13**	**0.10**	**0.06**	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**16.5**	**28.0**	**3.12**	**2.13**	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		**0.05**	<0.02	<0.02	<0.02	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.10	µg/L		----	----	----	----	<0.10
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		----	----	----	----	**0.06**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		----	----	----	----	**0.26**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		----	----	----	----	**0.03**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		----	----	----	----	**0.04**
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW235_220929	1302_MW454_220929	1302_MW144_220929	1302_MW210_220928	1302_MW156_220928
				Sampling date / time	29-Sep-2022 13:20	29-Sep-2022 13:30	28-Sep-2022 13:50	28-Sep-2022 06:30	28-Sep-2022 07:48
Compound	CAS Number	LOR	Unit		ES2235227-017	ES2235227-018	ES2235227-019	ES2235227-020	ES2235227-021
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		----	----	----	----	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		----	----	----	----	<0.05
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.2**	**0.4**	<0.1	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.35**	**0.66**	**0.05**	**0.03**	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**1.88**	**3.86**	**0.27**	**0.12**	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.21**	**0.42**	**0.03**	**0.02**	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.48**	**0.81**	**0.08**	**0.05**	----
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
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW235_220929	1302_MW454_220929	1302_MW144_220929	1302_MW210_220928	1302_MW156_220928
				Sampling date / time	29-Sep-2022 13:20	29-Sep-2022 13:30	28-Sep-2022 13:50	28-Sep-2022 06:30	28-Sep-2022 07:48
Compound	CAS Number	LOR	Unit		ES2235227-017	ES2235227-018	ES2235227-019	ES2235227-020	ES2235227-021
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		**0.03**	<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
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
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	----
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		----	----	----	----	**5.56**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW235_220929	1302_MW454_220929	1302_MW144_220929	1302_MW210_220928	1302_MW156_220928
				Sampling date / time	29-Sep-2022 13:20	29-Sep-2022 13:30	28-Sep-2022 13:50	28-Sep-2022 06:30	28-Sep-2022 07:48
Compound	CAS Number	LOR	Unit		ES2235227-017	ES2235227-018	ES2235227-019	ES2235227-020	ES2235227-021
					Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**----**	**----**	**----**	**----**	**4.76**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**----**	**----**	**----**	**----**	**5.32**
Sum of PFAS	----	0.01	µg/L		**27.9**	**55.7**	**5.46**	**3.35**	**----**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**22.7**	**43.2**	**4.55**	**2.87**	**----**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**26.6**	**51.8**	**5.17**	**3.21**	**----**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.8**	**89.0**	**103**	**97.6**	**----**
13C4-PFOS	----	0.02	%		**----**	**----**	**----**	**----**	**102**
13C8-PFOA	----	0.02	%		**99.1**	**98.3**	**96.7**	**97.9**	**----**
13C8-PFOA	----	0.02	%		**----**	**----**	**----**	**----**	**98.9**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW205_220928	1302_MW195_220928	1302_QC100_220928	1302_MW194_220928	1302_MW190_220928
				Sampling date / time	28-Sep-2022 08:29	28-Sep-2022 07:08	28-Sep-2022 08:30	28-Sep-2022 09:57	28-Sep-2022 10:16
					ES2235227-023	ES2235227-024	ES2235227-025	ES2235227-026	ES2235227-027
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.04**	**0.05**	**0.03**	**0.12**	**0.13**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.06**	**0.06**	**0.04**	**0.14**	**0.19**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.54**	**0.52**	**0.33**	**1.14**	**1.61**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.03**	**0.03**	<0.02	**0.08**	**0.10**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.91**	**0.92**	**0.67**	**2.70**	**2.78**
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	**0.04**	**0.05**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.05**	**0.04**	**0.02**	**0.27**	**0.29**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	**0.03**	**0.03**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.01**	**0.01**	<0.01	**0.08**	**0.08**
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: WATER (Matrix: WATER)				Sample ID	1302_MW205_220928	1302_MW195_220928	1302_QC100_220928	1302_MW194_220928	1302_MW190_220928
				Sampling date / time	28-Sep-2022 08:29	28-Sep-2022 07:08	28-Sep-2022 08:30	28-Sep-2022 09:57	28-Sep-2022 10:16
Compound	CAS Number	LOR	Unit		ES2235227-023	ES2235227-024	ES2235227-025	ES2235227-026	ES2235227-027
					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		**1.64**	**1.63**	**1.09**	**4.60**	**5.26**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.45**	**1.44**	**1.00**	**3.84**	**4.39**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**1.55**	**1.54**	**1.05**	**4.38**	**4.97**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.9**	**97.9**	**95.4**	**97.0**	**104**
13C8-PFOA	----	0.02	%		**101**	**98.0**	**93.6**	**98.5**	**96.4**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW191_220928	1302_MW185_220928	1302_MW209_220928	1302_QC101_220928	1302_QC300_220928
				Sampling date / time	28-Sep-2022 10:35	28-Sep-2022 10:54	28-Sep-2022 00:00	28-Sep-2022 11:26	28-Sep-2022 11:26
					ES2235227-028	ES2235227-029	ES2235227-030	ES2235227-031	ES2235227-032
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.08**	**0.03**	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.11**	**0.04**	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.04**	**0.26**	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.05**	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**2.14**	**0.12**	<0.01	**0.02**	<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		**0.03**	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.17**	**0.03**	<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		**0.05**	**0.02**	<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: WATER (Matrix: WATER)				Sample ID	1302_MW191_220928	1302_MW185_220928	1302_MW209_220928	1302_QC101_220928	1302_QC300_220928
				Sampling date / time	28-Sep-2022 10:35	28-Sep-2022 10:54	28-Sep-2022 00:00	28-Sep-2022 11:26	28-Sep-2022 11:26
Compound	CAS Number	LOR	Unit		ES2235227-028	ES2235227-029	ES2235227-030	ES2235227-031	ES2235227-032
					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		**3.67**	**0.50**	<0.01	**0.02**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**3.18**	**0.38**	<0.01	**0.02**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**3.51**	**0.46**	<0.01	**0.02**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.1**	**97.2**	**88.3**	**90.0**	**88.1**
13C8-PFOA	----	0.02	%		**95.3**	**101**	**94.8**	**97.6**	**97.5**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_MW451_220928	1302_MW148_220928	1302_MW452_220928	1302_QC102_220928	1302_MW180_220929
				Sampling date / time	28-Sep-2022 12:25	28-Sep-2022 12:35	28-Sep-2022 12:50	28-Sep-2022 12:50	29-Sep-2022 07:00
					ES2235227-036	ES2235227-037	ES2235227-038	ES2235227-039	ES2235227-040
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.14**	**0.08**	**0.12**	**0.04**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.25**	**0.12**	**0.19**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**3.13**	**1.61**	**2.41**	**0.12**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.20**	**0.08**	**0.11**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.02**	**5.43**	**2.72**	**3.25**	**0.15**
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	**0.04**	**0.03**	**0.04**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.23**	**0.14**	**0.19**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.04**	**0.02**	**0.03**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.11**	**0.04**	**0.06**	<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: WATER (Matrix: WATER)				Sample ID	1302_MW451_220928	1302_MW148_220928	1302_MW452_220928	1302_QC102_220928	1302_MW180_220929
				Sampling date / time	28-Sep-2022 12:25	28-Sep-2022 12:35	28-Sep-2022 12:50	28-Sep-2022 12:50	29-Sep-2022 07:00
Compound	CAS Number	LOR	Unit		ES2235227-036	ES2235227-037	ES2235227-038	ES2235227-039	ES2235227-040
					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		**0.02**	**9.57**	**4.84**	**6.40**	**0.31**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	**8.56**	**4.33**	**5.66**	**0.27**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	**9.12**	**4.64**	**6.10**	**0.31**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**95.6**	**102**	**95.3**	**100**	**91.8**
13C8-PFOA	----	0.02	%		**99.6**	**101**	**92.8**	**95.0**	**99.6**

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2235227**	Page	: 1 of 8
Amendment	: **1**		

Client	[redacted]
Contact	
Address	
Telephon	
Project	
Order num	
C-O-C nu	
Sampler	
Site	: ----
Quote number	: SY/139/19 V3
No. of samples received	: 40
No. of samples analysed	: 35

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*
[redacted]		

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 (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4628685)									
ES2235227-004	1302_QC300_220929	EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: 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: 4628685)									
ES2235227-004	1302_QC300_220929	EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	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 (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4628685) - continued									
ES2235227-004	1302_QC300_220929	EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	<0.10	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4628685)									
ES2235227-004	1302_QC300_220929	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 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: 4628685)									
ES2235227-004	1302_QC300_220929	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 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: 4628685)									
ES2235227-004	1302_QC300_220929	EP231X-INJ: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: 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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4626505)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	84.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	87.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	124	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	104	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	106	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	105	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4626833)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	127	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	119	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	124	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	121	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	109	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4628685)								
EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.5 µg/L	86.8	72.0	130
EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.5 µg/L	103	71.0	127
EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.5 µg/L	94.2	68.0	131
EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.5 µg/L	102	69.0	134
EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.5 µg/L	92.0	65.0	140
EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	99.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4626505)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	124	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	124	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	114	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	107	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	108	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	107	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	115	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	76.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	118	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4626833)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	122	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: 4626833) - continued								
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	121	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	125	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	120	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	123	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	122	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	113	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	128	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4628685)								
EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	2.5 µg/L	96.6	73.0	129
EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	94.6	72.0	129
EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	97.4	72.0	129
EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	96.6	72.0	130
EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	98.0	71.0	133
EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	91.4	69.0	130
EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	95.0	71.0	129
EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	94.2	69.0	133
EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	104	72.0	134
EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	98.6	65.0	144
EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	91.6	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4626505)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	80.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	101	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	122	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	116	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	122	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: 4626833)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	126	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	131	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	120	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: 4626833) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	141	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	123	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	125	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	114	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4628685)								
EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	93.2	67.0	137
EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	102	68.0	141
EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	104	68.4	127
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	1.25 µg/L	97.6	64.4	132
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	103	60.2	125
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	83.2	65.0	136
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	101	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4626505)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	103	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.25 µg/L	113	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	118	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	93.8	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4626833)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	133	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	122	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	116	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	95.2	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4628685)								
EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.5 µg/L	102	63.0	143
EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.5 µg/L	96.6	64.0	140
EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.5 µg/L	113	67.0	138
EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.5 µg/L	103	62.7	135
EP231P: PFAS Sums (QCLot: 4628685)								
EP231X-INJ: 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: 4628685) - continued								
EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: 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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4628685)							
ES2235227-021	1302_MW156_220928	EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.5 µg/L	72.6	72.0	130
		EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.5 µg/L	117	71.0	127
		EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.5 µg/L	109	68.0	131
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.5 µg/L	97.8	69.0	134
		EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	# Not Determined	65.0	140
		EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.5 µg/L	113	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4628685)							
ES2235227-021	1302_MW156_220928	EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	113	73.0	129
		EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	104	72.0	129
		EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	112	72.0	129
		EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	115	72.0	130
		EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	112	71.0	133
		EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	120	69.0	130
		EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	114	71.0	129
		EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	106	69.0	133
		EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	110	72.0	134
		EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.5 µg/L	109	65.0	144
		EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	118	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4628685)							
ES2235227-021	1302_MW156_220928	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	113	67.0	137
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	121	68.0	141
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	124	68.5	127
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	1.25 µg/L	124	64.4	132

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: 4628685) - continued							
ES2235227-021	1302_MW156_220928	EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	111	60.2	125
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	120	65.0	136
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	116	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4628685)							
ES2235227-021	1302_MW156_220928	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.5 µg/L	115	63.0	143
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.5 µg/L	111	64.0	140
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.5 µg/L	114	67.0	138
		EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.5 µg/L	115	62.7	135

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order : **ES2235227** Page : 1 of 8

Amendment : **1**

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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							
EP231A: Perfluoroalkyl Sulfonic Acids	ES2235227--021	1302_MW156_220928	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	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	
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	36	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	36	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*
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_MW144_220929, 1302_MW210_220928	**28-Sep-2022**	**10-Oct-2022**	27-Mar-2023	✓	**10-Oct-2022**	27-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
1302_MW156_220928, 1302_MW205_220928, 1302_MW195_220928, 1302_QC100_220928, 1302_MW194_220928, 1302_MW190_220928, 1302_MW191_220928, 1302_MW185_220928, 1302_MW209_220928, 1302_QC101_220928, 1302_QC300_220928, 1302_MW451_220928, 1302_MW148_220928, 1302_MW452_220928, 1302_QC102_220928	**28-Sep-2022**	**10-Oct-2022**	27-Mar-2023	✓	**11-Oct-2022**	27-Mar-2023	✓
HDPE (no PTFE) (EP231X)							

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 - Continued								
1302_MW200_220929,	1302_MW211_220929,	**29-Sep-2022**	**10-Oct-2022**	28-Mar-2023	✓	**10-Oct-2022**	28-Mar-2023	✓
1302_QC100_220929,	1302_QC500_220929,							
1302_MW176_220929,	1302_MW103_220929,							
1302_MW107_220929,	1302_MW215_220929,							
1302_MW141_220929,	1302_QC101_220929,							
1302_MW303_220929,	1302_MW133_220929,							
1302_MW297_220929,	1302_MW139_220929,							
1302_MW235_220929,	1302_MW454_220929							
HDPE (no PTFE) (EP231X)								
1302_QC300_220929,	1302_MW180_220929	**29-Sep-2022**	**10-Oct-2022**	28-Mar-2023	✓	**11-Oct-2022**	28-Mar-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
1302_MW144_220929,	1302_MW210_220928	**28-Sep-2022**	**10-Oct-2022**	27-Mar-2023	✓	**10-Oct-2022**	27-Mar-2023	✓
HDPE (no PTFE) (EP231X)								
1302_MW156_220928,	1302_MW205_220928,	**28-Sep-2022**	**10-Oct-2022**	27-Mar-2023	✓	**11-Oct-2022**	27-Mar-2023	✓
1302_MW195_220928,	1302_QC100_220928,							
1302_MW194_220928,	1302_MW190_220928,							
1302_MW191_220928,	1302_MW185_220928,							
1302_MW209_220928,	1302_QC101_220928,							
1302_QC300_220928,	1302_MW451_220928,							
1302_MW148_220928,	1302_MW452_220928,							
1302_QC102_220928								
HDPE (no PTFE) (EP231X)								
1302_MW200_220929,	1302_MW211_220929,	**29-Sep-2022**	**10-Oct-2022**	28-Mar-2023	✓	**10-Oct-2022**	28-Mar-2023	✓
1302_QC100_220929,	1302_QC500_220929,							
1302_MW176_220929,	1302_MW103_220929,							
1302_MW107_220929,	1302_MW215_220929,							
1302_MW141_220929,	1302_QC101_220929,							
1302_MW303_220929,	1302_MW133_220929,							
1302_MW297_220929,	1302_MW139_220929,							
1302_MW235_220929,	1302_MW454_220929							
HDPE (no PTFE) (EP231X)								
1302_QC300_220929,	1302_MW180_220929	**29-Sep-2022**	**10-Oct-2022**	28-Mar-2023	✓	**11-Oct-2022**	28-Mar-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)							
1302_MW144_220929, 1302_MW210_220928	**28-Sep-2022**	**10-Oct-2022**	27-Mar-2023	✓	**10-Oct-2022**	27-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
1302_MW156_220928, 1302_MW205_220928, 1302_MW195_220928, 1302_QC100_220928, 1302_MW194_220928, 1302_MW190_220928, 1302_MW191_220928, 1302_MW185_220928, 1302_MW209_220928, 1302_QC101_220928, 1302_QC300_220928, 1302_MW451_220928, 1302_MW148_220928, 1302_MW452_220928, 1302_QC102_220928	**28-Sep-2022**	**10-Oct-2022**	27-Mar-2023	✓	**11-Oct-2022**	27-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
1302_MW200_220929, 1302_MW211_220929, 1302_QC100_220929, 1302_QC500_220929, 1302_MW176_220929, 1302_MW103_220929, 1302_MW107_220929, 1302_MW215_220929, 1302_MW141_220929, 1302_QC101_220929, 1302_MW303_220929, 1302_MW133_220929, 1302_MW297_220929, 1302_MW139_220929, 1302_MW235_220929, 1302_MW454_220929	**29-Sep-2022**	**10-Oct-2022**	28-Mar-2023	✓	**10-Oct-2022**	28-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
1302_QC300_220929, 1302_MW180_220929	**29-Sep-2022**	**10-Oct-2022**	28-Mar-2023	✓	**11-Oct-2022**	28-Mar-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)							
1302_MW144_220929, 1302_MW210_220928	**28-Sep-2022**	**10-Oct-2022**	27-Mar-2023	✓	**10-Oct-2022**	27-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
1302_MW156_220928, 1302_MW205_220928, 1302_MW195_220928, 1302_QC100_220928, 1302_MW194_220928, 1302_MW190_220928, 1302_MW191_220928, 1302_MW185_220928, 1302_MW209_220928, 1302_QC101_220928, 1302_QC300_220928, 1302_MW451_220928, 1302_MW148_220928, 1302_MW452_220928, 1302_QC102_220928	**28-Sep-2022**	**10-Oct-2022**	27-Mar-2023	✓	**11-Oct-2022**	27-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
1302_MW200_220929, 1302_MW211_220929, 1302_QC100_220929, 1302_QC500_220929, 1302_MW176_220929, 1302_MW103_220929, 1302_MW107_220929, 1302_MW215_220929, 1302_MW141_220929, 1302_QC101_220929, 1302_MW303_220929, 1302_MW133_220929, 1302_MW297_220929, 1302_MW139_220929, 1302_MW235_220929, 1302_MW454_220929	**29-Sep-2022**	**10-Oct-2022**	28-Mar-2023	✓	**10-Oct-2022**	28-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
1302_QC300_220929, 1302_MW180_220929	**29-Sep-2022**	**10-Oct-2022**	28-Mar-2023	✓	**11-Oct-2022**	28-Mar-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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_MW144_220929, 1302_MW210_220928	**28-Sep-2022**	**10-Oct-2022**	27-Mar-2023	✓	**10-Oct-2022**	27-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
1302_MW156_220928, 1302_MW205_220928, 1302_MW195_220928, 1302_QC100_220928, 1302_MW194_220928, 1302_MW190_220928, 1302_MW191_220928, 1302_MW185_220928, 1302_MW209_220928, 1302_QC101_220928, 1302_QC300_220928, 1302_MW451_220928, 1302_MW148_220928, 1302_MW452_220928, 1302_QC102_220928	**28-Sep-2022**	**10-Oct-2022**	27-Mar-2023	✓	**11-Oct-2022**	27-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
1302_MW200_220929, 1302_MW211_220929, 1302_QC100_220929, 1302_QC500_220929, 1302_MW176_220929, 1302_MW103_220929, 1302_MW107_220929, 1302_MW215_220929, 1302_MW141_220929, 1302_QC101_220929, 1302_MW303_220929, 1302_MW133_220929, 1302_MW297_220929, 1302_MW139_220929, 1302_MW235_220929, 1302_MW454_220929	**29-Sep-2022**	**10-Oct-2022**	28-Mar-2023	✓	**10-Oct-2022**	28-Mar-2023	✓
HDPE (no PTFE) (EP231X)							
1302_QC300_220929, 1302_MW180_220929	**29-Sep-2022**	**10-Oct-2022**	28-Mar-2023	✓	**11-Oct-2022**	28-Mar-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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	36	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	2	**50.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	36	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	2	**50.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	36	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	2	**50.00**	**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
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.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with mobile phase solvent. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. 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.

Preparation Methods	Method	Matrix	Method Descriptions
Preparation for PFAS in water.	EP231-PR	WATER	Method presumes direct injection without workup. Preparation includes addition of internal standard and surrogate, and filtration prior to analysis.
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.

Australian Government
Department of Industry, Science and Resources

National Measurement Institute

SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [redacted]
Customer:
Address:
Email:
Telephone:
Fax:

LABORATORY DETAILS

Lab: [redacted]
Contact:
Address:
Email:
Telephone:
Fax:

SAMPLE DETAILS

NMI Job Name: AECO09/220831

Total No. of Samples: 1

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N22/017201	7-SEP-2022	1302_QC200_220826	WATER 26/08/2022

[redacted]

SAMPLE RECEIVED CONDITION

Date samples received:	31-AUG-2022
Sample received in good order:	Yes
NMI Quotation no. provided:	60667360
Client purchase order number:	60667360
Temperature of samples:	Chilled
Comments:	ALL OK
Mode of Delivery:	Courier

Additional Terms and Conditions

Incomplete / unclear information about samples or required testing will delay the start of the analysis work.

If you require your Purchase Order (PO) number to be included on our invoice, please provide the number during sample submission and before the completion of work to avoid unnecessary delays and/or additional processing/handling fees.

The lodgement of an order or receipt of samples for NMI services referenced in this Sample Receipt Notification constitutes an acceptence of the current version of NMI Terms and Conditions or other applicable Terms referenced in the NMI Quotation. NMI Terms and Conditions are available on the web at https://www.industry.gov.au/client-services/testing-and-analysis-services/chemical-and-biological-analysis-services-terms-and-conditions

REPORT OF ANALYSIS

Report No. RN1365240

Client : [redacted]

Your Client Services Manager : Tim Reddan **Phone** : 03 9644 4854

Lab Reg No.	Sample Ref	Sample Description
N22/017201	1302_QC200_220826	WATER 26/08/2022

Lab Reg No.		N22/017201				
Date Sampled		26-AUG-2022				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05				NR70
PFPeA (2706-90-3)	ug/L	<0.02				NR70
PFHxA (307-24-4)	ug/L	0.078				NR70
PFHpA (375-85-9)	ug/L	<0.01				NR70
PFOA (335-67-1)	ug/L	0.020				NR70
PFNA (375-95-1)	ug/L	<0.01				NR70
PFDA (335-76-2)	ug/L	<0.01				NR70
PFUdA (2058-94-8)	ug/L	<0.01				NR70
PFDoA (307-55-1)	ug/L	<0.01				NR70
PFTrDA (72629-94-8)	ug/L	<0.02				NR70
PFTeDA (376-06-7)	ug/L	<0.02				NR70
PFHxDA (67905-19-5)	ug/L	<0.02				NR70
PFODA (16517-11-6)	ug/L	<0.05				NR70
FOUEA (70887-84-2)	ug/L	<0.01				NR70
PFDS (335-77-3)	ug/L	<0.01				NR70
PFPeS (2706-91-4)	ug/L	0.066				NR70
PFHxS (355-46-4)	ug/L	0.57				NR70
PFHpS (375-92-8)	ug/L	0.019				NR70
PFOS (1763-23-1)	ug/L	0.62				NR70
PFNS (68259-12-1)	ug/L	<0.01				NR70
PFBS (375-73-5)	ug/L	0.053				NR70
PFOSA (754-91-6)	ug/L	<0.01				NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02				NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02				NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01				NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01				NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05				NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05				NR70
4:2 FTS (757124-72-4)	ug/L	<0.01				NR70
6:2 FTS (27619-97-2)	ug/L	<0.01				NR70

REPORT OF ANALYSIS

Lab Reg No.		N22/017201				
Date Sampled		26-AUG-2022				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
8:2 FTS (39108-34-4)	ug/L	<0.01				NR70
10:2 FTS (120226-60-0)	ug/L	<0.01				NR70
8:2 diPAP (678-41-1)	ug/L	<0.02				NR70
PFBA (Surrogate Recovery)	%	133				NR70
PFPeA (Surrogate Recovery)	%	136				NR70
PFHxA (Surrogate Recovery)	%	125				NR70
PFHpA (Surrogate Recovery)	%	134				NR70
PFOA (Surrogate Recovery)	%	133				NR70
PFNA (Surrogate Recovery)	%	134				NR70
PFDA (Surrogate Recovery)	%	134				NR70
PFUdA (Surrogate Recovery)	%	132				NR70
PFDoA (Surrogate Recovery)	%	129				NR70
PFTeDA (Surrogate Recovery)	%	119				NR70
PFHxDA (Surrogate Recovery)	%	143				NR70
FOUEA (Surrogate Recovery)	%	99				NR70
PFBS (Surrogate Recovery)	%	126				NR70
PFHxS (Surrogate Recovery)	%	123				NR70
PFOS (Surrogate Recovery)	%	134				NR70
PFOSA (Surrogate Recovery)	%	124				NR70
N-MeFOSA (Surrogate Recovery)	%	104				NR70
N-EtFOSA (Surrogate Recovery)	%	94				NR70
N-MeFOSAA (Surrogate Recovery)	%	124				NR70
N-EtFOSAA (Surrogate Recovery)	%	120				NR70
N-MeFOSE (Surrogate Recovery)	%	114				NR70
N-EtFOSE (Surrogate Recovery)	%	91				NR70
4:2 FTS (Surrogate Recovery)	%	128				NR70
6:2 FTS (Surrogate Recovery)	%	119				NR70
8:2 FTS (Surrogate Recovery)	%	116				NR70
8:2 diPAP (Surrogate Recovery)	%	117				NR70
Dates						
Date extracted		6-SEP-2022				
Date analysed		6-SEP-2022				

N22/017201
PFOS and PFHxS are quantified using a combined branched and linear standard,
linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

REPORT OF ANALYSIS

Lab Reg No.		N22/017201				
Date Sampled		26-AUG-2022				
	Units					Method

[redacted]

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This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1364485*
RN1364493

Measurement Uncertainty is available upon request.

Note: Sampling date(s) have been provided by the client.
Chemical Accreditation 198: [redacted]

[redacted]

Australian Government
Department of Industry, Science and Resources

National Measurement Institute

SAMPLE RECEIPT NOTIFICATION

CUSTOMER DETAILS

Attention: [redacted]

LABORATORY DETAILS

[redacted]

SAMPLE DETAILS

NMI Job Name: AECO09/220831/2

Total No. of Samples: 1

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N22/017204	7-SEP-2022	302_QC201_220826	SOIL 26/08/22

[redacted]

SAMPLE RECEIVED CONDITION

Date samples received:	31-AUG-2022
Sample received in good order:	Yes
NMI Quotation no. provided:	60667360
Client purchase order number:	60667360
Temperature of samples:	Chilled
Comments:	ALL OK
Mode of Delivery:	Courier

Additional Terms and Conditions

Incomplete / unclear information about samples or required testing will delay the start of the analysis work.

If you require your Purchase Order (PO) number to be included on our invoice, please provide the number during sample submission and before the completion of work to avoid unnecessary delays and/or additional processing/handling fees.

The lodgement of an order or receipt of samples for NMI services referenced in this Sample Receipt Notification constitutes an acceptence of the current version of NMI Terms and Conditions or other applicable Terms referenced in the NMI Quotation. NMI Terms and Conditions are available on the web at https://www.industry.gov.au/client-services/testing-and-analysis-services/chemical-and-biological-analysis-services-terms-and-conditions

REPORT OF ANALYSIS

Report No. RN1365241

Client : [redacted]

Phone : 03 9644 4854

Lab Reg No.	Sample Ref	Sample Description
N22/017204	1302_QC201_220826	SOIL 26/08/22

Lab Reg No.		N22/017204				
Date Sampled		26-AUG-2022				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	mg/kg	<0.002				NR70
PFPeA (2706-90-3)	mg/kg	<0.002				NR70
PFHxA (307-24-4)	mg/kg	<0.001				NR70
PFHpA (375-85-9)	mg/kg	<0.001				NR70
PFOA (335-67-1)	mg/kg	<0.001				NR70
PFNA (375-95-1)	mg/kg	<0.001				NR70
PFDA (335-76-2)	mg/kg	<0.001				NR70
PFUdA (2058-94-8)	mg/kg	<0.002				NR70
PFDoA (307-55-1)	mg/kg	<0.002				NR70
PFTrDA (72629-94-8)	mg/kg	<0.002				NR70
PFTeDA (376-06-7)	mg/kg	<0.002				NR70
PFHxDA (67905-19-5)	mg/kg	<0.002				NR70
PFODA (16517-11-6)	mg/kg	<0.005				NR70
FOUEA (70887-84-2)	mg/kg	<0.001				NR70
PFBS (375-73-5)	mg/kg	<0.001				NR70
PFPeS (2706-91-4)	mg/kg	<0.001				NR70
PFHxS (355-46-4)	mg/kg	<0.001				NR70
PFHpS (375-92-8)	mg/kg	<0.001				NR70
PFOS (1763-23-1)	mg/kg	<0.002				NR70
PFNS (68259-12-1)	mg/kg	<0.001				NR70
PFDS (335-77-3)	mg/kg	<0.001				NR70
PFOSA (754-91-6)	mg/kg	<0.001				NR70
N-MeFOSA (31506-32-8)	mg/kg	<0.002				NR70
N-EtFOSA (4151-50-2)	mg/kg	<0.002				NR70
N-MeFOSAA (2355-31-9)	mg/kg	<0.002				NR70
N-EtFOSAA(2991-50-6)	mg/kg	<0.002				NR70
N-MeFOSE (24448-09-7)	mg/kg	<0.005				NR70
N-EtFOSE (1691-99-2)	mg/kg	<0.005				NR70
4:2 FTS (757124-72-4)	mg/kg	<0.001				NR70
6:2 FTS (27619-97-2)	mg/kg	<0.001				NR70

REPORT OF ANALYSIS

Lab Reg No.		N22/017204				
Date Sampled		26-AUG-2022				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
8:2 FTS (39108-34-4)	mg/kg	<0.001				NR70
10:2 FTS (120226-60-0)	mg/kg	<0.002				NR70
8:2 diPAP (678-41-1)	mg/kg	<0.002				NR70
PFBA (Surrogate Recovery)	%	133				NR70
PFPeA (Surrogate Recovery)	%	133				NR70
PFHxA (Surrogate Recovery)	%	128				NR70
PFHpA (Surrogate Recovery)	%	128				NR70
PFOA (Surrogate Recovery)	%	138				NR70
PFNA (Surrogate Recovery)	%	136				NR70
PFDA (Surrogate Recovery)	%	141				NR70
PFUdA (Surrogate Recovery)	%	144				NR70
PFDoA (Surrogate Recovery)	%	140				NR70
PFTeDA (Surrogate Recovery)	%	166				NR70
PFHxDA (Surrogate Recovery)	%	146				NR70
FOUEA (Surrogate Recovery)	%	88				NR70
PFBS (Surrogate Recovery)	%	125				NR70
PFHxS (Surrogate Recovery)	%	123				NR70
PFOS (Surrogate Recovery)	%	129				NR70
PFOSA (Surrogate Recovery)	%	136				NR70
N-MeFOSA (Surrogate Recovery)	%	132				NR70
N-EtFOSA (Surrogate Recovery)	%	128				NR70
N-MeFOSAA (Surrogate Recovery)	%	142				NR70
N-EtFOSAA (Surrogate Recovery)	%	160				NR70
N-MeFOSE (Surrogate Recovery)	%	120				NR70
N-EtFOSE (Surrogate Recovery)	%	96				NR70
4:2 FTS (Surrogate Recovery)	%	122				NR70
6:2 FTS (Surrogate Recovery)	%	124				NR70
8:2 FTS (Surrogate Recovery)	%	133				NR70
8:2 diPAP (Surrogate Recovery)	%	167				NR70
Dates						
Date extracted		6-SEP-2022				
Date analysed		6-SEP-2022				

N22/017204
PFOS and PFHxS are quantified using a combined branched and linear standard,
linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

Selected PFAS surrogate recoveries are biased due to matrix effects.ô

REPORT OF ANALYSIS

High PFAS surrogate recoveries accepted - results corrected for recovery.

[redacted]

14-SEP-2022

Lab Reg No.		N22/017204				
Date Sampled		26-AUG-2022				
	Units					Method
Trace Elements						
Total Solids	%	91.7				NT2_49
Dates						
Date extracted		6-SEP-2022				
Date analysed		7-SEP-2022				

[redacted]

14-SEP-2022

All results are expressed on a dry weight basis.

NATA
WORLD RECOGNISED
ACCREDITATION

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This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1364443* *RN1364463*
RN1364467

Measurement Uncertainty is available upon request.

Note: Sampling date(s) have been provided by the client.

[redacted]

REPORT OF ANALYSIS

Chemical Accreditation 198: 1[redacted]

REPORT OF ANALYSIS

Report No. RN1368680

Client [redacted]

Phone [redacted]

Lab Reg No.	Sample Ref	Sample Description
N22/019599	1302_QC200_220929	WATER 29/09/22 08:30
N22/019600	1302_QC201_220929	WATER 29/09/22 11:50
N22/019601	1302_QC202_220928	WATER 28/09/22 09:00

Lab Reg No.		N22/019599	N22/019600	N22/019601		
Date Sampled		29-SEP-2022	29-SEP-2022	28-SEP-2022		
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	0.67	<0.05	<0.05		NR70
PFPeA (2706-90-3)	ug/L	<0.02	0.038	0.024		NR70
PFHxA (307-24-4)	ug/L	<0.01	0.19	0.096		NR70
PFHpA (375-85-9)	ug/L	<0.01	0.020	0.016		NR70
PFOA (335-67-1)	ug/L	<0.01	0.052	0.034		NR70
PFNA (375-95-1)	ug/L	<0.01	<0.01	<0.01		NR70
PFDA (335-76-2)	ug/L	<0.01	<0.01	<0.01		NR70
PFUdA (2058-94-8)	ug/L	<0.01	<0.01	<0.01		NR70
PFDoA (307-55-1)	ug/L	<0.01	<0.01	<0.01		NR70
PFTrDA (72629-94-8)	ug/L	<0.02	<0.02	<0.02		NR70
PFTeDA (376-06-7)	ug/L	<0.02	<0.02	<0.02		NR70
PFHxDA (67905-19-5)	ug/L	<0.02	<0.02	<0.02		NR70
PFODA (16517-11-6)	ug/L	<0.05	<0.05	<0.05		NR70
FOUEA (70887-84-2)	ug/L	<0.01	<0.01	<0.01		NR70
PFDS (335-77-3)	ug/L	<0.01	<0.01	<0.01		NR70
PFPeS (2706-91-4)	ug/L	<0.01	0.14	0.089		NR70
PFHxS (355-46-4)	ug/L	<0.01	1.3	1.1		NR70
PFHpS (375-92-8)	ug/L	<0.01	0.063	0.044		NR70
PFOS (1763-23-1)	ug/L	<0.02	2.2	1.8		NR70
PFNS (68259-12-1)	ug/L	<0.01	<0.01	<0.01		NR70
PFBS (375-73-5)	ug/L	<0.01	0.13	0.070		NR70
PFOSA (754-91-6)	ug/L	<0.01	<0.01	<0.01		NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02	<0.02	<0.02		NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02	<0.02	<0.02		NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01	<0.01	<0.01		NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01	<0.01	<0.01		NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05	<0.05	<0.05		NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05	<0.05	<0.05		NR70

REPORT OF ANALYSIS

Report No. RN1368680

Lab Reg No.		N22/019599	N22/019600	N22/019601		
Date Sampled		29-SEP-2022	29-SEP-2022	28-SEP-2022		
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
4:2 FTS (757124-72-4)	ug/L	<0.01	<0.01	<0.01		NR70
6:2 FTS (27619-97-2)	ug/L	<0.01	<0.01	<0.01		NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01	<0.01		NR70
10:2 FTS (120226-60-0)	ug/L	<0.01	<0.01	<0.01		NR70
8:2 diPAP (678-41-1)	ug/L	<0.02	<0.02	<0.02		NR70
PFBA (Surrogate Recovery)	%	133	131	131		NR70
PFPeA (Surrogate Recovery)	%	141	136	133		NR70
PFHxA (Surrogate Recovery)	%	131	148	134		NR70
PFHpA (Surrogate Recovery)	%	128	142	136		NR70
PFOA (Surrogate Recovery)	%	137	148	137		NR70
PFNA (Surrogate Recovery)	%	133	144	135		NR70
PFDA (Surrogate Recovery)	%	131	141	139		NR70
PFUdA (Surrogate Recovery)	%	126	145	127		NR70
PFDoA (Surrogate Recovery)	%	120	140	133		NR70
PFTeDA (Surrogate Recovery)	%	122	151	134		NR70
PFHxDA (Surrogate Recovery)	%	140	151	144		NR70
FOUEA (Surrogate Recovery)	%	87	88	93		NR70
PFBS (Surrogate Recovery)	%	130	146	137		NR70
PFHxS (Surrogate Recovery)	%	127	137	127		NR70
PFOS (Surrogate Recovery)	%	131	147	147		NR70
PFOSA (Surrogate Recovery)	%	85	99	103		NR70
N-MeFOSA (Surrogate Recovery)	%	63	69	79		NR70
N-EtFOSA (Surrogate Recovery)	%	63	68	81		NR70
N-MeFOSAA (Surrogate Recovery)	%	106	141	124		NR70
N-EtFOSAA (Surrogate Recovery)	%	106	128	116		NR70
N-MeFOSE (Surrogate Recovery)	%	78	85	94		NR70
N-EtFOSE (Surrogate Recovery)	%	73	82	89		NR70
4:2 FTS (Surrogate Recovery)	%	123	130	128		NR70
6:2 FTS (Surrogate Recovery)	%	114	123	120		NR70
8:2 FTS (Surrogate Recovery)	%	113	128	128		NR70
8:2 diPAP (Surrogate Recovery)	%	136	151	138		NR70
Dates						
Date extracted		11-OCT-2022	11-OCT-2022	11-OCT-2022		
Date analysed		11-OCT-2022	11-OCT-2022	11-OCT-2022		

N22/019599
to
N22/019601

[redacted]

REPORT OF ANALYSIS

PFOS and PFHxS are quantified using a combined branched and linear standard,
linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

Selected PFAS surrogate recoveries are biased due to matrix effects.ô
High PFAS surrogate recoveries accepted - results corrected for recovery.

[redacted]

NATA
WORLD RECOGNISED
ACCREDITATION

Accredited for compliance with ISO/IEC 17025 - Testing.
This report shall not be reproduced except in full.
Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1368669*

Measurement Uncertainty is available upon request.

Note: Sampling date(s) have been provided by the client.
Chemical Accreditation 198: [redacted]

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/221005 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	< 0.05	NA	NA	NA	135	NA
PFPeA (2706-90-3)	NR70	0.02	< 0.02	NA	NA	NA	109	NA
PFHxA (307-24-4)	NR70	0.01	< 0.01	NA	NA	NA	103	NA
PFHpA (375-85-9)	NR70	0.01	< 0.01	NA	NA	NA	108	NA
PFOA (335-67-1)	NR70	0.01	< 0.01	NA	NA	NA	108	NA
PFNA (375-95-1)	NR70	0.01	< 0.01	NA	NA	NA	110	NA
PFDA (335-76-2)	NR70	0.01	< 0.01	NA	NA	NA	107	NA
PFUdA (2058-94-8)	NR70	0.01	< 0.01	NA	NA	NA	99	NA
PFDoA (307-55-1)	NR70	0.01	< 0.01	NA	NA	NA	99	NA
PFTrDA (72629-94-8)	NR70	0.02	< 0.02	NA	NA	NA	100	NA
PFTeDA (376-06-7)	NR70	0.02	< 0.02	NA	NA	NA	102	NA
PFHxDA (67905-19-5)	NR70	0.02	< 0.02	NA	NA	NA	96	NA
PFODA (16517-11-6)	NR70	0.05	< 0.05	NA	NA	NA	86	NA
FOUEA (70887-84-2)	NR70	0.01	< 0.01	NA	NA	NA	109	NA
PFBS (375-73-5)	NR70	0.01	< 0.01	NA	NA	NA	104	NA
PFPeS (2706-91-4)	NR70	0.01	< 0.01	NA	NA	NA	107	NA
PFHxS (355-46-4)	NR70	0.01	< 0.01	NA	NA	NA	103	NA
PFHpS (375-92-8)	NR70	0.01	< 0.01	NA	NA	NA	109	NA
PFOS (1763-23-1)	NR70	0.02	< 0.02	NA	NA	NA	100	NA
PFNS (68259-12-1)	NR70	0.01	< 0.01	NA	NA	NA	93	NA
PFDS (335-77-3)	NR70	0.01	< 0.01	NA	NA	NA	105	NA
PFOSA (754-91-6)	NR70	0.01	< 0.01	NA	NA	NA	107	NA
N-MeFOSA (31506-32-8)	NR70	0.02	< 0.02	NA	NA	NA	101	NA
N-EtFOSA (4151-50-2)	NR70	0.02	< 0.02	NA	NA	NA	98	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	< 0.01	NA	NA	NA	98	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	< 0.01	NA	NA	NA	105	NA
N-MeFOSE (24448-09-7)	NR70	0.05	< 0.05	NA	NA	NA	98	NA
N-EtFOSE (1691-99-2)	NR70	0.05	< 0.05	NA	NA	NA	97	NA
4:2 FTS (757124-72-4)	NR70	0.01	< 0.01	NA	NA	NA	103	NA
6:2 FTS (27619-97-2)	NR70	0.01	< 0.01	NA	NA	NA	101	NA
8:2 FTS (39108-34-4)	NR70	0.01	< 0.01	NA	NA	NA	111	NA
10:2 FTS (120226-60-0)	NR70	0.01	< 0.01	NA	NA	NA	107	NA
8:2 diPAP (678-41-1)	NR70	0.02	< 0.02	NA	NA	NA	108	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA' = Not Applicable.
RPD= Relative Percentage Difference.

Sig [redacted]

Dat [redacted]

[redacted]

REPORT OF ANALYSIS

Report No. RN1369431

Client [redacted]

Lab Reg No.	Sample Ref	Sample Description
N22/020079	1302_QC200_221010	WATER 10/10/2022

Lab Reg No.		N22/020079				
Date Sampled		10-OCT-2022				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	0.076				NR70
PFPeA (2706-90-3)	ug/L	0.082				NR70
PFHxA (307-24-4)	ug/L	0.47				NR70
PFHpA (375-85-9)	ug/L	0.057				NR70
PFOA (335-67-1)	ug/L	0.14				NR70
PFNA (375-95-1)	ug/L	<0.01				NR70
PFDA (335-76-2)	ug/L	<0.01				NR70
PFUdA (2058-94-8)	ug/L	<0.01				NR70
PFDoA (307-55-1)	ug/L	<0.01				NR70
PFTrDA (72629-94-8)	ug/L	<0.02				NR70
PFTeDA (376-06-7)	ug/L	<0.02				NR70
PFHxDA (67905-19-5)	ug/L	<0.02				NR70
PFODA (16517-11-6)	ug/L	<0.05				NR70
FOUEA (70887-84-2)	ug/L	<0.01				NR70
PFDS (335-77-3)	ug/L	<0.01				NR70
PFPeS (2706-91-4)	ug/L	0.20				NR70
PFHxS (355-46-4)	ug/L	1.8				NR70
PFHpS (375-92-8)	ug/L	0.13				NR70
PFOS (1763-23-1)	ug/L	6.9				NR70
PFNS (68259-12-1)	ug/L	<0.01				NR70
PFBS (375-73-5)	ug/L	0.18				NR70
PFOSA (754-91-6)	ug/L	<0.01				NR70
N-MeFOSA (31506-32-8)	ug/L	<0.02				NR70
N-EtFOSA (4151-50-2)	ug/L	<0.02				NR70
N-MeFOSAA (2355-31-9)	ug/L	<0.01				NR70
N-EtFOSAA(2991-50-6)	ug/L	<0.01				NR70
N-MeFOSE (24448-09-7)	ug/L	<0.05				NR70
N-EtFOSE (1691-99-2)	ug/L	<0.05				NR70
4:2 FTS (757124-72-4)	ug/L	<0.01				NR70
6:2 FTS (27619-97-2)	ug/L	<0.01				NR70

REPORT OF ANALYSIS

Lab Reg No.		N22/020079				
Date Sampled		10-OCT-2022				
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
8:2 FTS (39108-34-4)	ug/L	0.023				NR70
10:2 FTS (120226-60-0)	ug/L	<0.01				NR70
8:2 diPAP (678-41-1)	ug/L	<0.02				NR70
PFBA (Surrogate Recovery)	%	107				NR70
PFPeA (Surrogate Recovery)	%	110				NR70
PFHxA (Surrogate Recovery)	%	108				NR70
PFHpA (Surrogate Recovery)	%	117				NR70
PFOA (Surrogate Recovery)	%	117				NR70
PFNA (Surrogate Recovery)	%	103				NR70
PFDA (Surrogate Recovery)	%	117				NR70
PFUdA (Surrogate Recovery)	%	122				NR70
PFDoA (Surrogate Recovery)	%	115				NR70
PFTeDA (Surrogate Recovery)	%	121				NR70
PFHxDA (Surrogate Recovery)	%	125				NR70
FOUEA (Surrogate Recovery)	%	90				NR70
PFBS (Surrogate Recovery)	%	108				NR70
PFHxS (Surrogate Recovery)	%	111				NR70
PFOS (Surrogate Recovery)	%	99				NR70
PFOSA (Surrogate Recovery)	%	103				NR70
N-MeFOSA (Surrogate Recovery)	%	73				NR70
N-EtFOSA (Surrogate Recovery)	%	75				NR70
N-MeFOSAA (Surrogate Recovery)	%	111				NR70
N-EtFOSAA (Surrogate Recovery)	%	114				NR70
N-MeFOSE (Surrogate Recovery)	%	88				NR70
N-EtFOSE (Surrogate Recovery)	%	85				NR70
4:2 FTS (Surrogate Recovery)	%	110				NR70
6:2 FTS (Surrogate Recovery)	%	103				NR70
8:2 FTS (Surrogate Recovery)	%	103				NR70
8:2 diPAP (Surrogate Recovery)	%	106				NR70
Dates						
Date extracted		14-OCT-2022				
Date analysed		14-OCT-2022				

N22/020079
PFOS and PFHxS are quantified using a combined branched and linear standard,
linear and branched isomers are totalled for reporting.
All results corrected for labelled surrogate recoveries.

REPORT OF ANALYSIS

Lab Reg No.		N22/020079				
Date Sampled		10-OCT-2022				
	Units					Method

[redacted]

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Results relate only to the sample(s) as received and tested.

This Report supersedes reports: *RN1369407*

Measurement Uncertainty is available upon request.

Note: Sampling date(s) have been provided by the client.
Chemical Accreditation 198: [redacted]

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/221013/1 **Sample Matrix:** Liquid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		ug/L	ug/L	ug/L	ug/L	%	%	%
PFBA (375-22-4)	NR70	0.05	<0.05	NA	NA	NA	107	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	101	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	95	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	95	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	95	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	102	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	99	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	93	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	109	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	107	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	109	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	102	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	92	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	106	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	91	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	106	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	98	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	100	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	97	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	94	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	100	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	97	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	104	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	99	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	94	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	89	NA
N-MeFOSE (24448-09-7)	NR70	0.05	<0.05	NA	NA	NA	102	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	96	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	102	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	98	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	106	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	106	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	111	NA

Results expressed in percentage (%) or ug/L wherever appropriate.
Acceptable Spike recovery is 50-150%.
Maximum acceptable RPDs on spikes and duplicates is 40%.
'NA ' = Not Applicable.
RPD= Relative Percentage Difference.

Signed:

Date:

Appendix G

Calibration Certificates

ECO Environmental

Environmental monitoring
& sampling equipment
Rentals and sales.

Tel: +61 8 9328 2900
fax: +61 8 9328 2677
eco@ecoenvironmental.com.au
www.ecoenvironmental.com.au
214 Lord St Perth WA 6000

Equipment Information

Instrument: YSI Pro Plus AECOM 1m 07/06/22
Serial Number: 19G102635 (Display)
16C100617 (Sonde)

YSI AH

Equipment Check

	Enclosed	Returned	Comment
YSI Pro Plus Display	☑	☐	
YSI Quatro Sonde	☑	☐	
- YSI 1001 pH Probe	☑	☐	
- YSI 1002 ORP Probe	☑	☐	
- YSI 5560 Cond/Temp Probe	☑	☐	
- YSI Polarographic DO Sensor	☑	☐	
Rubber Storage/Calibration Sleeve	☑	☐	
Calibration Cup + Cap	☑	☐	

Sensor Calibration Details

	Calibration Undertaken	Accuracy	Pass	Fail
Temperature	Factory Calibrated	±0.2°C	☑	☐
Dissolved Oxygen	☑ 100% Saturation	±2%	☑	☐
	Pressure Compensation	1018 hPa	☑	☐
Conductivity	☑ 12.88mS/cm	±0.5%	☑	☐
	☑ Check linearity at 1.413mS/cm	±0.5%	☑	☐
Salinity	Auto Calibrated	±1%	☑	☐
pH	☐ pH 7.00	± 0.2	☐	☐
	☐ pH 4.00	± 0.2	☐	☐
ORP	☐ _____mV at ____°C	±20mV	☐	☐

This is to certify that where possible, this instrument has been calibrated in accordance with the manufacturer's calibration procedure as recommended in the instrument service manual.

ECO Standard Rental Terms & Conditions apply to all equipment calibrations.

Regards

[redacted]

19/9/22
for the 26/10/22

Equipment Specialist
ECO Environmental

AECOM

Level 3, 9 Cavenagh Street
Darwin, Nt 0800

Water Quality Probe Calibration Sheet

Date	YSI #	Temp (°C)	pH 4		pH 7		DO (100%)		Electrical conductivity 1413 (µS/cm)		ORP		Initials
			Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	
27/9	A.	23.1	4.15	4.02	7.02	—	102%	—	1430	1418	231 @	23.1	[redacted]
7/10	A.	22.8	4.03	—	7.09	7.00	100%	—	1420	—	218 @	22.8	
19.10	B.	23.0	3.99	—	6.89	7.02	108%	99%	1410	—	225 @	23.0	

Prepared for
Department of Defence, Directorate of PFAS Remediation, Environment and Engineering Branch
ABN: 68706814312

DRAFT

Wet Season Sampling Event Factual Report 2023

PFAS OMP - RAAF Base Darwin

07-Jun-2023
RAAF Base Darwin

Art by
Bianca Gardiner Dodd

aecom.com

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Delivering a better world

D R A F T

Wet Season Sampling Event Factual Report 2023

PFAS OMP - RAAF Base Darwin

Client: Department of Defence, Directorate of PFAS Remediation, Environment and Engineering Branch

ABN: 68706814312

Prepared by

AECOM Australia Pty Ltd
Larrakia Country, Level 3, 9 Cavenagh Street, Darwin NT 0800, GPO Box 3175, Darwin NT 0801, Australia
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ABN 20 093 846 925

07-Jun-2023

Job No.: 60612561

AECOM in Australia and New Zealand is certified to ISO9001, ISO14001 and ISO45001.

D R A F T

Quality Information

Document	Wet Season Sampling Event Factual Report 2023
	PFAS OMP - RAAF Base Darwin
Ref	60612561
Date	07-Jun-2023
Prepared by	Spencer Fynn
Checker/s	Poppy Harding
Verifier/s	David Steele

Revision History

Rev	Revision Date	Details	Approved	
			Name/Position	Signature
A	07-Jun-2023	Draft	James Guzman Project Manager	

D R A F T

Table of Contents

List of Tables

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Abbreviations

Abbreviation	Term
AECOM	AECOM Australia Pty Ltd
ALS	ALS Environmental Pty Ltd
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999
DCMM	Defence Contamination Management Manual
Defence	Department of Defence
DO	Dissolved Oxygen
DIA	Darwin International Airport
DQI	Data Quality Indicators
DQO	Data Quality Objectives
EC	Electrical Conductivity
HEPA	Heads of Environment Protection Authority
LOR	Limit of Reporting
LNAPL	Light Non-Aqueous Phase Liquid
mAHD	meters Australian Height Datum
mbtoc	metres below top of casing
MW	Monitoring Well
NATA	National Association of Testing Authorities
NEMP	National Environmental Management Plan
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
NT	Northern Territory
NSW	New South Wales
OMP	Ongoing Monitoring Program
ORP	Oxidation Reduction Potential
PFAS	Per- and poly-fluoroalkyl substances
PFHxS	Perfluorohexanesulfonic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctanesulfonic acid
PMAP	PFAS Management Area Plan
QA/QC	Quality Assurance and Quality Control
RAAF	Royal Australian Air Force
SAQP	Sampling and Analysis Quality Plan
SW	Surface Water

D R A F T

List of Units

Unit	Definition	Unit	Definition
^{o}C	degrees Celsius	mg	milligrams
cm	centimetre	mV	millivolts
L	litre	µg	micrograms
m	metre	µS	micro siemens
mAHD	metres Australian Height Datum	NTU	Nephelometric Turbidity Unit
mbtoc	metres below top of casing		

D R A F T

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Program (OMP) outlined in the *PFAS Management Area Plan (PMAP)* (Department of Defence, 2019a) at RAAF Base Darwin (the 'Site') in the Northern Territory. The location of the Site and Management Area is shown in **Figure 1** in **Appendix A**. The OMP (Department of Defence, 2019a) for the Site outlines the requirement to complete annual biota sampling and biannual groundwater and surface water sampling.

The primary purpose of the OMP is to monitor changes to the PFAS impact in groundwater and surface water pathways associated with sources of PFAS as initially assessed through the detailed site investigation phase of works. Changes may result from the specific or cumulative impact of remediation or containment actions, existing transportation trends, and changes to hydrogeology or weather events.

The monitoring program at RAAF Base Darwin includes a regime of groundwater, surface water and biota sampling to capture these changes in the long term, to enable Defence to maintain an up-to-date understanding of temporal and spatial distribution, concentration, and transport of PFAS contaminants.

This report details the scope and findings of the 2022 late dry season biota monitoring activities, which was completed in October 2022, and the 2022-2023 wet season monitoring activities, which were completed between November 2022 and April 2023.

1.2 Objectives

The purpose of this PFAS OMP factual report is to summarise the scope of works and findings from sampling works conducted between October 2022 and April 2023. These works included:

- Annual biota in October 2022, twice in wet season surface water in November 2022, and PFAS mass-flux surface water monthly during the wet season in December 2022 sampling events conducted in accordance with Revision 1 Sampling and Analysis Quality Plan (SAQP) (AECOM, 2021).
- Biannual groundwater in March 2023, twice in wet season surface water in March 2023, and PFAS mass-flux surface water monthly during the wet season in January 2023, February 2023, March 2023, and April 2023 conducted in accordance with Revision 2 SAQP (AECOM, 2023)

This report has been prepared in accordance with the *PFAS OMP Factual Report Guidance,* v0.2, May 2021 (Department of Defence, 2021).

An annual interpretive report will be subsequently developed for the purpose of assessing the data collected during the discrete monitoring events completed over the preceding 12-month period (May2022 – April 2023) and will include assessment of environmental variability and any statistically significant trends in PFAS concentrations.

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2.0 Scope of work

2.1 Overarching scope

The biota and wet season sampling events were completed in general accordance with the then current SAQP (AECOM, 2021) (AECOM, 2023); see Section 2.2 for deviations from the SAQP.

Prior to commencement of the sampling events, the SAQP was reviewed to ensure compliance with the following:

- The OMP (Department of Defence, 2019a)
- Heads of the Environment Protection Authority (HEPA), PFAS National Environmental Management Plan (NEMP 2.0) (HEPA, 2020)
- National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended 2013 (ASC NEPM, 2013)
- Defence Routine Environment Water Quality Monitoring Manual (Department of Defence, 2019b)
- AS/NZ 5667:1998 Water quality – Sampling (AS/NZS, 1998)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018).

In summary, the scope of works for the 2022-2023 wet season included:

- October 2022
  - Annual aquatic biota samples (fish and aquatic invertebrate) were collected in October 2022 from six annual locations using a combination of netting, trapping and hand collection. Laboratory analysis and review was completed in January 2023.
- November 2022
  - Twice in wet season surface water samples were collected from 21 of 22 sample locations for the start of wet season sampling (refer to **Table 3** and **Figure 2 in Appendix A** for specific locations).
  - A sample location SW152 was erroneously not sampled.
  - SW300 was an additional sample
- March 2023
  - Completed works included biannual gauging of groundwater levels at 34 of 34 planned monitoring wells and collection of groundwater samples (using Hydrasleeves™) from 34 of 34 planned monitoring wells (refer to **Table 2** below, and **Figure 3 in Appendix A** for specific locations).
  - Monitoring location MW422 was inaccessible due to construction activities occurring in the area therefore contingency well MW235 was sampled instead of MW422.
  - Monitoring location MW144 was gauged, and a Hydrasleeves™ deployed however it was not retrieved until 20 April 2023.
  - Twice in wet season surface water samples were collected from 24 of 24 sample locations for the end of wet season sampling (refer to **Table 4** and **Figure 2 in Appendix A** for specific locations).
- December 2022 to April 2023
  - Monthly in wet season collection of surface water samples was completed from four locations for the Base-wide PFAS mass flux investigation (refer to **Table 5** and **Figure 2 in Appendix A** for specific locations) during December 2022, January 2023, February 2023, March 2023, and April 2023.

- Overall:
  - Collection of intra- and inter-laboratory duplicate samples at a rate of 1 in 10 primary samples, one rinsate and one field blank sample per fieldwork day for groundwater. Deviations from the collection of QC samples are described in **Section 2.3**
  - Analysis of biota, surface water and groundwater samples for a suite of 28 PFAS analytes at the standard limit of reporting (LOR).
  - Data management of the OMP field and laboratory data in the Defence ESdat database.
  - Preparation of this Sampling Event Factual Report.

2.2 Monitoring locations

The monitoring locations documented in the SAQP (AECOM, 2021) (AECOM, 2023) for the biota sampling, groundwater sampling and surface water sampling events are outlined below in their respective tables. Deviations from the planned sampling are detailed in Section2.3.

Table 1 Annual biota sampling locations (collected in October 2022 then processed in January 2023)

Area	Description	Sampling locations	Indicator/target capture	No. of locations	Total
Off-Base (biota)	Rapid Creek Freshwater – Upstream of Trower Road	BIOFA024, BIOFA26, BIOFA028	Crustaceans	3	6 locations
	Ludmilla Creek – Estuarine area	BIOFA016	Molluscs	1	
	Rapid Creek mouth – Casuarina Drive	BIOFA007	Diadromous or estuarine fish	1	
	Ludmilla Creek – Boat Ramp	BIOFA018	Diadromous or estuarine fish	1	

* The biota sampling locations in Figure 4 (Appendix A) are approximate, as exact locations vary depending on habitat available on the day of sampling.

The monitoring locations outlined within the SAQP (AECOM, 2023) for the groundwater sampling event are outlined in Table 2 below:

Table 2 Biannual groundwater sampling locations sampled in March 2023 SAQP (AECOM, 2023)

Area	Description	Sampling locations	Number of wells/bores	Total
On site	Former fuel farm 1	MW215	1	22 locations
	Former fuel farm 5	MW297, MW112	2	
	Former fuel farms	MW303, MW133, MW205	3	
	Former fire training area 1	MW422*, MW139, MW454	3	
	Current fire training area	MW240, MW241, MW453	3	
	RAAF fire station	MW103	1	
	Former ARFF fire station	MW115	1	
	Source area downgradient transect	MW107, MW128	2	

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Area	Description	Sampling locations	Number of wells/bores	Total
	Southern boundary of site	MW141, MW144	2	
	Western boundary of site	MW148, MW451, MW452	3	
	Rapid Creek – eastern end	MW156	1	
Off site	Former fire training area 2, Darwin International Airport (DIA)	MW197	1	12 locations
	Off-base (north)	MW185	1	
	Rapid Creek	MW190, MW191, MW194, MW195	4	
	Off-base (south)	MW176, MW180, MW200, MW209	4	
	Off-base (southwest)	MW211	1	
	Off-base (west)	MW210	1	

* Contingency location MW235 sampled in lieu of MW422 due to no access.

The monitoring locations outlined within the SAQP (AECOM, 2021) (AECOM, 2023) for the surface water sampling events are outlined in Table 3, Table 4, and Table 5 below:

Table 3 Twice in wet season surface water sampling locations in November 2022 SAQP (AECOM, 2021)

Area	Description	Sampling location code	Number of locations	Total
On-Base	Surface water flow – current fire training ground	SW156	1	7 Locations
	Stormwater pipe – Airside operations	SW160	1	
	Stormwater – southern boundary	SW162	1	
	Surface water drain – Eastern end of runway	SW170	1	
	Surface water drain – near Former Fuel Farm 5	SW178	1	
	Surface water drain – north of Former Fuel Farms 4 & 6	SW181	1	
	Rapid Creek	SW152	1	
Off-Base	Rapid Creek	SW104, SW106, SW108, SW109, SW112, SW113	6	15 Locations
	DIA drain to Rapid Creek	SW114, SW115, SW168	3	
	Ludmilla Creek	SW120, SW124, SW125	3	
	Reichardt Creek	SW132, SW133	2	
	Drain to Sadgroves Creek	SW143	1	

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Table 4 Twice in wet season surface water sampling locations in March 2023 SAQP (AECOM, 2023)

Area	Description	Sampling Location Code	Number of locations	Total
On-Base	Surface water flow – current fire training ground	SW156	1	8 Locations
	Stormwater pipe - Airside operations	SW160	1	
	Stormwater– southern boundary	SW162	1	
	Surface water drain - near Former Fuel Farm 5	SW178	1	
	Surface water drain - north of Former Fuel Farms 4 & 6	SW181	1	
	Rapid Creek	SW152	1	
	Surface water drain - Eastern end of runway	SW170^	1	
	Drainage from FFTA1	SW312^	1	
Off-Base	Rapid Creek	SW104, SW106, SW108, SW112, SW113	5	16 Locations
	DIA drain to Rapid Creek	SW114, SW115, SW168	3	
	Ludmilla Creek	SW120, SW124, SW125	3	
	Reichardt Creek	SW132, SW133	2	
	Drain to Sadgroves Creek	SW143	1	
	Osgood Drive	SW300^	1	
	Rapid Creek	SW109^	1	

^ Also Base-wide Mass Flux Investigation location

Table 5 Base- wide PFAS mass-flux monthly in wet season surface water locations completed in December 2022 and April 2023 SAQP (AECOM, 2021) (AECOM, 2023)

Area	Description	Sampling locations	Number of wells/bores	Total
On-Base	Surface water drain – Eastern end of runway	SW170	1	2 Locations
	Drainage from FFTA1	SW312	1	
Off-Base	Rapid Creek	SW109	1	2 Locations
	Osgood Road	SW300	1	

2.3 Deviations from the SAQP

The biannual groundwater monitoring in March 2023 and the twice in wet season surface water sampling in November 2022 included some deviations as outlined in their respective tables below.

Mass-flux sampling was added to the scope to provide data to the Base PFAS lead consultant for their mass flux assessment. This scope had not been incorporated into the SAQP (AECOM, 2021) prior to sampling taking place and is therefore considered a deviation from the previous SAQP. The current version of the SAQP includes all the appropriate scope.

Table 6 Deviations from the SAQP (AECOM, 2021) during the twice in wet season surface water sampling event in November 2022

SAQP	November sampling event	Impact on OMP
22 surface water locations are identified to be sampled as part of the sampling event	During the November surface water event, samples were collected from 21 of 22 locations. The following was not collected: • SW152 erroneously not sampled	Minimal impact – data gap for this location, however samples are collected both up-gradient and down-gradient of sampling location SW152. If there were any significant findings that would impact potential users of Rapid Creek, those impacts would likely be observed in samples collected from other parts of the Rapid Creek drainage system. Last sampling at SW152 was in January 2022 (0.22 ug/L) where concentrations were approximately an order of magnitude below the PFAS NEMP v2.0 recreational use guidelines (2.0 ug/L).
22 surface water locations are identified to be sampled as part of the sampling event	Sample location SW300 was not in the SAQP version at the time but has been added into the current version	No impact – additional data point for this location
One rinsate (QC300) per sampling day	During the November surface water event only one rinsate (QC300) was collected instead of three. It was erroneously not sampled – field staff understood the rate to be one per field event rather than one per sampling day.	The decontamination method of the sampling pole is assessed as acceptable and the potential for cross contamination via sampling methods is considered unlikely based on the following: • Concentrations of all analytes were reported below the LOR in the rinsate sample analysed. • All sampling equipment was either dedicated, disposable or decontaminated with a solution of water and Liquinox between sampling locations. • The decontamination methods and field staff were consistent over the course of the sampling event.

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SAQP	November sampling event	Impact on OMP
		• All reported surface water sampling results were within expected concentration ranges. • Two locations, SW114 and SW115, had reported PFAS concentrations below the LOR, indicating that cross contamination due to field sampling methods is unlikely.
One field blank (QC400) per sampling day	During the November surface water event, field blank (QC400) samples were not collected at a rate of one per day.	The rinsate analysed was below LOR for all analytes and therefore cross contamination via volatilisation whilst sampling is unlikely.
One trip blank (QC500) per esky	During the November surface water event no trip blank was collected.	The rinsate and field blank analysed was below LOR for all analytes and therefore cross contamination via volatilisation during transport to the laboratory is unlikely. Additionally, two locations, SW114 and SW115, had reported PFAS concentrations below the LOR, indicating that cross contamination during sample transport is unlikely.

Table 7 Deviation from the SAQP (AECOM, 2021) during the monthly wet season PFAS Mass-Flux surface water sampling event in December 2022

SAQP	March sampling event	Impact on OMP
Collection of surface water at four locations	Three of four locations were sampled for surface water: • SW300 was dry during the December sampling event	Minimal impact – Concentration irrelevant if location is dry. Missing data for SW300

Table 8 Deviation from the SAQP (AECOM, 2023) during the biannual groundwater sampling event in March 2023

SAQP	March sampling event	Impact on OMP
34 groundwater locations identified to be sampled as part of the biannual sampling event	During the March groundwater event, samples were collected from 33 of 34 wells: • Location MW144 was erroneously not sampled during fieldworks; the groundwater well was gauged but a sample was not taken. The sample was collected on 20 April 2023 • Location MW422 was inaccessible due to construction activities occurring in the	• No impact – MW144 was sampled at later date 20 April 2023. The Depth to Water recorded as metres below top of casing (mbTOC) was measured during both the gauging and

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SAQP	March sampling event	Impact on OMP
	vicinity and field staff were unable to gain access. PMAP identified alternative location MW235 was gauged and sampled in lieu.	sampling events and there was minimal change in groundwater levels recorded (approximately 0.2m) suggesting the results would not be materially impacted by sampling at a later date. • No impact – SAQP identified alternative location MW235 sampled in lieu.

Table 9 Deviation from the SAQP (AECOM, 2021) during the biannual surface water sampling event in March 2023

SAQP	March sampling event	Impact on OMP
NA	There were no deviations from the biannual surface water sampling event in March 2023.	NA

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3.0 Sampling methodology

3.1 Groundwater, surface water, and aquatic biota

The methodology adopted for the sampling events between October 2022 and April 2023 (where applicable) was in accordance with the SAQP (AECOM, 2021) (AECOM, 2023) and is summarised below in Table 10

Table 10 Sampling methodology

Item	Details
Aquatic biota sampling	
Aquatic biota target samples	Target species for each identified sample location were based on those that are recognised as consumed by the public from the following three groups: • Diadromous or estuarine fish (Barramundi, Flathead, Javelin, Sweetlips, Mullet, Rock Cod, Queenfish, Jewfish, etc.) • Molluscs (Longbums [Telescopium] and Whelk) • Crustaceans (Redclaw Crayfish [C. quadricarinatus.])
Aquatic biota sampling methodology	Sampling was conducted by Eco Logical Australia Pty Ltd and the Northern Territory (NT) Department of Fisheries between the 25 and 31 of October 2022. Ethics approvals and Fisheries/Parks & Wildlife licenses were obtained prior to biota sample collection. Estuarine fish were collected using 4-6-inch gill nets set three hours before low tide. Nets were continuously monitored from a small boat and cleared when movement was detected. Any non-target species were released immediately and where targeted biota species were identified, they were measured, weighed and euthanised humanely in accordance with the animal ethics permits conditions. Redclaw were captured using Opera House traps baited with raw beef (purchased from a supermarket). Traps were set overnight in freshwater pools and collected in the early morning. Longbums were hand-collected during low tide from the mangroves. Redclaw and Longbums were rinsed prior to being stored in snap-lock bags, euthanised by freezing and preserved frozen until preparation at NT Fisheries wet room laboratories. Samples were prepared for analysis at the Department of Fisheries laboratory prior to dispatching to the primary laboratory. This included the removal of scales/shell, head, and internal organs. Fillets were taken with skin intact and homogenised prior to sub-sampling and analysis. Samples were prepared based on the following procedure: • For Target fish: - Used opened bag as board cover - Cleaned knife/blade with deionised water - For large fish the complete tissue samples of edible flesh was collected. - For smaller fish, samples were provided whole with entrails removed. • For Redclaw Crayfish: - Rinsed in deionised water - Composited whole as 50-100g samples (about 3-5 individuals per sample). • For Longbum: - Shells placed inside a sample bag and carefully smashed with a hammer, then tissue extracted with forceps - Tissue rinsed with deionised water - Composited 10 individuals as a sample • The weight, length, species, and location caught were recorded.
QAQC samples	Field QA/QC samples collected included rinsate and split samples (intra-laboratory duplicates) which are described as the following:

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Item	Details
	• Rinsate samples were taken from decontaminated sample processing equipment (filleting knife) • Split samples were taken from fin fish to ensure homogeneity for intra-laboratory analysis rather than composite samples of crustaceans. Refer to **Appendix D** for data validation report of the results.
Sample analysis	All samples collected were tested for the extended suite of PFAS. Samples were submitted to the primary laboratory for analysis in accordance with the SAQP. Australian Laboratory Services Environmental (ALS) Sydney, New South Wales (NSW) was used as the primary laboratory. ALS methods for analyses were certified by the National Association of Testing Authorities (NATA). Chain of custody (COC) forms and laboratory certificates are presented in **Appendix E** and **Appendix F**, respectively.
Groundwater sampling	
Groundwater gauging	Groundwater gauging was conducted prior to collection of groundwater samples using an oil/water interface probe. Measurements included depth to light non-aqueous phase liquid (LNAPL) (if any), depth to water and total depth (if no product).
Field parameters	Where appropriate, field parameters were recorded ex-situ using a calibrated YSI Pro water quality meter (refer to **Appendix G** for calibration certificate). Parameters recorded consisted of the following: temperature (°C), electrical conductivity (EC), dissolved oxygen (DO), reduction- oxidation (redox) potential (ORP) and pH. Observations of odour, colour, and clarity (turbidity) of groundwater was recorded at each site.
Sampling methodology	Groundwater samples were collected from all accessible wells using the no-purge HydraSleeves™ method installed one-metre below the standing water level of each well for a minimum of 24 hours prior to the sampling. This was based on a review of the well construction log.
QAQC samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples, rinsate, field blank and trip blank samples. Refer to **Appendix D** for data validation report of the results.
Sample analysis	Samples were submitted to the primary and secondary laboratories for PFAS analysis. ALS Environmental Sydney, NSW was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW and/or ALS Brisbane, QLD was used as the secondary laboratory. ALS and NMI methods for analyses were certified by the NATA. COC forms and laboratory certificates are presented in **Appendix E** and **Appendix F,** respectively.
Surface water sampling	
Sampling methodology	Surface water samples were collected from approximately 0.5 metres below the water surface to minimise collection of sediment or floating materials in the samples. At each location, a new, laboratory supplied container was lowered into the water, using an aluminium sampling pole, with the cap immediately applied once the container was full.
Field parameters	Where appropriate, field parameters were recorded ex-situ using a calibrated YSI Pro water quality meter (refer to **Appendix G** for calibration certificate). Parameters recorded consisted of the following: temperature, EC, DO, ORP and pH. Observations of odour, colour, and clarity (turbidity) and general flow observations were recorded at each site.

Item	Details
QAQC samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples, rinsate, field blank and trip blank samples. Refer to **Appendix D** for data validation report of the results
Sample analysis	Samples were submitted to the primary and secondary laboratories for PFAS analysis. ALS Environmental Sydney, NSW was used as the primary laboratory. The National Measurement Institute (NMI) of Sydney, NSW and/or ALS Brisbane, QLD was used as the secondary laboratory. ALS and NMI methods for analyses were certified by the NATA. COC forms and laboratory certificates are presented in **Appendix E** and **Appendix F**, respectively.

3.2 Adopted screening criteria

Screening criteria were selected on the basis of national guidance in the form of the PFAS NEMP 2.0 (HEPA, 2020), Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset includes the following:

- Department of Health, 2019. Health based guidance values for PFAS for use in site investigations in Australia. April 2017 (as amended 2019) (Department of Health, 2019).
- Heads of the Environment Protection Authority (HEPA), 2020. PFAS NEMP 2.0. (HEPA, 2020).
- National Health and Medical Research Council (NHMRC), 2019. Guidance on Per and Polyfluoroalkyl (PFAS) in Recreational Water (NHMRC, 2019).

The screening criteria which have been adopted for aquatic biota are presented in **Table 11**.

Table 11 Summary of adopted screening criteria for consumption of aquatic biota

Pathway	Compound	Criteria	Comment/reference
Human health receptors			
Crustaceans	PFOS and PFOS + PFHxS	65 µg/kg	Department of Health (2019) *Derivation: Children 2-6 years, median consumption* Occasionally consumed food. Trigger criteria for investigation for crustaceans apply to molluscs due to the small number of consumers of molluscs.
	PFOA	520 µg/kg	
Finfish	PFOS and PFOS + PFHxS	5.2 µg/kg	Department of Health (2019). *Derivation: Children 2-6 years, P90 consumption*
	PFOA	41 µg/kg	

The screening criteria which have been adopted for groundwater and surface water are presented in **Table 12.**

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Table 12 Summary of adopted screening criteria for groundwater and surface water

Pathway	Compound	Criteria	Comment/Reference
Human health receptors			
Drinking water - groundwater	PFOS + PFHxS	0.07 µg/L	These values are from the PFAS NEMP 2.0 (HEPA, 2020). *All groundwater results will be compared to these criteria.*
	PFOA	0.56 µg/L	
Recreational use – surface water	PFOS + PFHxS	2 µg/L	The values presented in the PFAS NEMP 2.0 (HEPA, 2020) are from the Guidance on Per and Polyfluoroalkyl (PFAS) in Recreational Water (NHMRC, 2019) guidance on the assessment of PFAS in recreational water released in August 2019. *All surface water results will be compared to these criteria.*
	PFOA	10 µg/L	
	PFOA	20mg/kg	
Ecological receptors			
Freshwater (99% species protection values) - surface water	PFOS PFOA	0.00023 µg/L 19 µg/L	These values are from the PFAS NEMP 2.0 (HEPA, 2020). The 99% level of protection has been applied for slightly to moderately disturbed ecosystems. This approach is generally adopted for chemicals that bioaccumulate and biomagnify in wildlife. For the purposes of preliminary screening of analytical water results, the laboratory LOR will be adopted rather than sole use of the criteria value. *All surface water results will be compared to these criteria.*

3.3 Data quality objectives and data validation

The data quality objectives (DQOs) and data quality indicators (DQIs) adopted for these works are presented in the SAQP (AECOM, 2021) (AECOM, 2023).

Data validation assessment is provided in **Appendix D**.

The analytical data can be used as a basis for interpretation subject to the limitations outlined below:

- Elevated RPDs should be taken into consideration when using data for sum of PFOS, PFHxS PFOA and Sum of PFHxS and PFOS quantitatively and when interpreting data close to guidelines from primary batches ES224803 (November 2022 surface water), ES2302423 (January 2023 surface water), ES2310999 (March 2023 groundwater) and ES2311000 (March 2023 surface water).
- The potential exists for concentrations of PFOS to be below the LOR, but above the guideline in surface water samples 1302_SW114_221123, 1302_SW115_221123, 1302_SW300_221125, 1302_SW115_230327 and groundwater sample 1302_MW209_230320. This should be taken into consideration when interpreting results.

Data validation procedures employed in the assessment of the field and laboratory QA/QC data are indicative that the analytical data produced is acceptably reliable for the purpose of this report.

All data collected during this event has been reviewed and uploaded to the Defence ESdat database in accordance with Defence Contamination Management Manual (DCMM) (Department of Defence, 2019) Annex L requirements.

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4.0 Field observations and results

4.1 General field observations

The following field observations were applicable across RAAF Base Darwin during sampling events and is provided in **Appendix C**.

Table 13 General field observations

Item	Observation
Weather conditions	Weather for the 25-31 October 2022 biota sampling event was observed to be partly cloudy, cool, and slightly humid. Temperature ranged from 26.0°C min to 36.4°C max, and medium to high relative humidity from 63 percent – 70 percent. No precipitation was recorded over the sampling event (Darwin Airport weather station, 014015) (Bureau of Meteorology, 2023).
	Weather for the 23-25 November 2022 surface water event was observed to be partly cloudy, warm, and humid. Temperature ranged from 23. 5°C min to 34.4°C max, and medium to high relative humidity from 57.7 percent – 97 percent. 8.2 mm and 4.8 mm precipitation were recorded on 23 and 24 November 2022 respectively and no precipitation on 25 November 2022 (Darwin Airport weather station, 014015) (Bureau of Meteorology, 2023).
	Weather for the 13-29 March 2023 groundwater and surface water sampling event was observed to be partly cloudy, hot, and humid. Temperature ranged from 22.9°C to 34.5°C, and medium to high relative humidity from 51 percent – 96 percent. 78.6 mm of precipitation was recorded between 13 and 29 March 2023. (Darwin Airport weather station, 014015) (Bureau of Meteorology, 2023).
Estate management works or training activities	During the sampling event, no notable estate works, or training activities were observed in the vicinity of sampling locations with the exception of the following: • Airforce flying associated training activities were being undertaken. This did not detrimentally interfere with the sampling program; however, minor delays were presented. • Fencing and earth moving activities associated with the PFAS Soil RAP works at Former Fire Training Ground 1.

4.2 Biota

4.2.1 Field observations and field measurements

Table 14 Biota observations

Item	Observation
Field Observations	Sample descriptions were provided by NT Fisheries field staff following the biota sampling event via an excel spreadsheet, noting species type, weight, and number of specimens. These are presented in **Appendix B- Table T1.**
Access and Sample Collection	All monitoring locations were accessible and able to be sampled. Fish and invertebrate species collected and analysed included: **Ludmilla Creek (BIOFA018):** Pikey Bream (*Acanthopagrus pacificus*) Brown Sweetlips (Plectorhinchus gibbosus) Forktail Catfish 1 (*Neoarius sp.1*) Forktail Catfish 2 (*Neoarius sp.2*) Australian Giant Herring (Elops machnata) Sand Crab (Portunus pelagicus) Scat (Scatophagus sp.) Barramundi (Lates calcarifer) Sea Mullet (*Mugil cephalus*) **Rapid Creek (BIOFA007):**

Item	Observation
	Barramundi (Lates calcarifer) Banded Archerfish (Toxotes jaculatrix) Sicklefish (Drepane punctata) Sea Mullet (Mugil cephalus) Forktail Catfish (*Neoarius sp.1)* Forktail Catfish (*Neoarius sp.2)* Orange Mud Crab (Scylla olivacea) **Ludmilla Creek (BIOFA016):** Long Bum (*Telescopium telescopium*) Giant Mangrove Whelk (*Terabralia palustris*) **Rapid Creek (BIOFA024, BIOFA026 and BIOFA028):** Redclaw Crayfish (*Cherux quadricarinatus*)

4.2.2 PFAS biota analytical results

Results from the November biota sampling event reported 34 of 57 primary samples above the LOR for PFAS. Biota samples that exceeded the adopted criteria included seven finfish biota samples and two crustacean samples. The PFAS biota analytical results are presented in **Appendix B - Table T1.**

4.3 Groundwater results

4.3.1 Field observations and field measurements

Table 15 Groundwater observations and field measurements

Item	Observations and field measurements
Fieldwork dates	The groundwater sampling was completed between 13 and 29 March 2023. It is noted that MW144 was gauged and a HydraSleeve™ was deployed however, the collection of the HydraSleeve™ did not occur until 20 April 2023.
Access and sample collection	All monitoring wells and bores were accessible and able to be sampled with the exception of the following: • Monitoring well MW422 was not sampled due to a construction site fence blocking access to the well. The identified contingency well (MW235) was sampled in lieu
Monitoring well network condition	The monitoring well network was generally in good condition.
Field observations	Monitoring well MW303 located near the fuel tank farm on Bombing Road was observed to emit a slight hydrocarbon odour.

Item	Observations and field measurements
Depth to groundwater and flow direction	Depth to groundwater was recorded from 34 of 34 wells visited, ranging from 1.160 (MW209) to 6.800 (MW144) metres below top of casing (mbtoc). Groundwater elevations in the aquifer were between 4.25 (MW185) and 28.66 (MW115) metres Australian Height Datum (mAHD). Groundwater gauging data is presented in **Table T2** in **Appendix C.** Inferred groundwater contours and groundwater flow directions at the Site in March 2023 are shown on **Figure 3** in **Appendix A**. A localised high point is located in the centre of the Base, south of the runway, with the groundwater flow radiating from this location. Groundwater in the north and west portions of the Base is inferred to generally flow northwest towards the coast, with localised flow towards Ludmilla Creek on the western boundary of the Base and Rapid Creek north of the Base. Groundwater to the south of the site is inferred to flow towards Charles Darwin National Park and Francis Bay. Groundwater contours are generally consistent with the Detailed Site Investigation (Coffey, 2018) flow direction.
Geochemical parameters	Groundwater geochemical parameters were measured during sample collection from the HydraSleeve™ using a sterilised YSI cup and YSI Pro Water Quality Meter. The readings are presented in **Table T2 in Appendix B,** and YSI calibration certificate in **Appendix G,** and are summarised below: DO ranged from 0.15 mg/L (MW297) to 4.38 mg/L (MW200). EC ranged from 31.0 µS/cm (MW144, MW453, MW240) to 544 µS/cm (MW139). The majority of readings were below 100 µS/cm indicating generally low salinity, with higher salinity generally at lower groundwater elevations around the perimeter of the monitoring network. pH ranged from 3.87 (MW235) to 6.86 (MW144) indicating acidic to neutral conditions. ORP (corrected) ranged from -75.0 mV (MW297) to 130.6 mV (MW144) indicating reducing to oxidising conditions.

4.3.2 PFAS groundwater analytical results

During this sampling event, 33 of the 34 groundwater locations sampled (all other than MW209) reported concentrations of PFAS above the laboratory limits of reporting (LOR).

There were no first-time exceedances of the drinking water guideline value (0.07 µg/L) at any of the sampled groundwater monitoring locations.

New maximum concentrations were reported for on-Base locations MW453 (12.6 µg/L- previous maxima 8.18 µg/L) for Sum of PFHxS and PFOS and PFOA and MW452 (0.09 µg/L- previous maxima 0.06 µg/L for PFOA

The PFAS groundwater analytical results from the March 2023 sampling event are presented in **Table T3** in **Appendix B.**

Table 16 First-time detections of PFAS and new exceedances of guideline values in groundwater

Type	Location ID	Sum of PFHxS + PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFOS concentration (µg/L)	
		March 2023	Historical maximum	March 2023	Historical maximum	March 2023	Historical maximum
First-time detections of PFHxS+PFOS, PFOS or PFOA in groundwater.	There were no first-time detections above the limit of reporting for PFHxS+PFOS or PFOA in groundwater.						
New exceedance of NEMP 2.0 (HEPA, 2020) drinking water guideline values in groundwater.	No new exceedances of the drinking water guideline for PFOA or sum PFOS+PFHxS were reported in groundwater.						

4.4 Surface water – November 2022 event

4.4.1 Field observations and field measurements

Table 17 Surface water observations and field measurements for November 2022

Item	Observations and field measurements
Fieldwork dates	The surface water samples, and field parameters were subsequentially collected between 23 and 25 November 2022.
Access and sample collection	All surface water locations were accessible and able to be sampled with the exception of SW152 which was erroneously not sampled.
Field observations	Rapid creek system generally had high flows with low turbidity. RAAF Base Darwin drainage areas varied with pooled water to moderate flow from recent precipitation with low to moderate turbidity. DIA drainage systems had moderate flow and low turbidity. All other peripheral sampling locations being coastal, presented out going tides with moderate flow and relatively high salinity.
Rainfall	81.6mm of rainfall was reported for the Darwin Area (Darwin Airport weather station, 014015) during the month until the 23 November 2022 (Bureau of Meteorology, 2023). 13mm rainfall was recorded during the sampling event.
Surface water flow	General surface water flow was moderate to strong in the Rapid Creek system. Other drainage lines presented low to moderate flows.

Item	Observations and field measurements
Water quality measurements	Surface water quality measurements were measured after the collection of surface water samples in November 2022. The stabilised readings are presented in **Table T4 in Appendix B**, and are summarised below: DO ranged from 0.10 mg/L (SW124) to 1.87 mg/L (SW181). EC ranged from 13.1 µS/cm (SW181) to 58105.0 µS/cm (SW124). pH ranged from 5.22 (SW108) to 7.88 (SW113) indicating a range from mildly acidic to mildly basic conditions. Redox (corrected) ranged from 102.4 mV (SW300-additional sample point) to 300.6 mV (SW125) indicating oxidising conditions.

4.4.2 PFAS surface water analytical results

During this sampling event, 19 of 22 surface water samples (including additional sampling point SW300) reported concentrations of PFAS above the laboratory limit of reporting (LOR).

There were no first-time detections or new exceedances of the adopted criteria at any of the sampled surface water monitoring locations

The PFAS surface water analytical results from the November 2022 sampling event are presented in **Table T5 in Appendix B**.

Table 18 First-time detection of PFAS and new exceedances of guideline values in surface water November 2022

Type	Location ID	Sum of PFHxS + PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFOS concentration (µg/L)	
		November 2022	Historical maximum	November 2022	Historical maximum	November 2022	Historical maximum
First-time detections of PFHxS+PFOS, PFOS or PFOA in surface water.	There were no first-time detections above the limit of reporting for PFHxS+PFOS or PFOA in surface water.						
New exceedance of NEMP 2.0 (HEPA, 2020) recreational use guideline values in surface water.	No new exceedances of the recreational use guideline for PFOA or sum PFOS+PFHxS were reported in surface water.						
New exceedance of NEMP 2.0 (HEPA, 2020) ecological water guideline value for surface water	No new exceedances of the ecological guideline PFOS and PFOA were reported in surface water, noting that the ecological guideline for PFOS is below the limit of reporting.						

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4.5 Surface water – March 2023 event

4.5.1 Field observations and field measurements

Table 19 Surface water observations and field measurements

Item	Observations and field measurements
Fieldwork dates	The surface water samples, and field parameters were subsequentially collected from 27 to 28 March 2023.
Access and sample collection	All surface water locations were accessible and able to be sampled.
Field observations	Rapid Creek system generally had high flows with low turbidity. RAAF Base Darwin drainage culverts varied with pooled water from recent precipitation with low to moderate turbidity. DIA drainage systems had low to no flow and low turbidity. All other peripheral sampling locations presented low salinity not being influenced by tides. Tidal influenced sites presented with relatively high salinity.
Rainfall	136.0mm of rainfall was reported for the Darwin Area (Darwin Airport weather station, 014015) during the month until 27 March 2023 (Bureau of Meteorology, 2023). 18.8mm rainfall was recorded during the sampling event.
Water quality measurements	Surface water quality measurements were measured after collecting surface water samples in March 2023. The stabilised readings are presented in **Table T4 in Appendix B** and are summarised below: • DO ranged from 2.30 mg/L (SW104) to 4.79 mg/L (SW312). • EC ranged from 22.4 µS/cm (SW133) to 8889 µS/cm (SW113). • pH ranged from 5.15 (SW138) to 7.71 (SW124) indicating slightly acidic to relatively neutral conditions. • Redox (corrected) ranged from 233.1 mV (SW132) to 327.1 mV (SW113) indicating oxidising conditions.

4.5.2 PFAS surface water analytical results

During this sampling event, 23 of 24 surface water locations sampled reported concentrations of PFAS above the laboratory limits of reporting (LOR).

There were no first-time detections or new exceedances of the adopted criteria at any of the sampled surface water monitoring locations.

New maximum detections for PFHxS+PFOS were reported at on-Base location SW181 and off-Base locations SW104, SW132, and SW114 in March 2023.

New maximum detection for PFOA was reported for on-Base location SW156 in March 2023

The PFAS surface water analytical results from the March 2023 sampling event are presented in **Table T5** in **Appendix B**.

4.6 Surface water Base-Wide PFAS Mass Flux – December 2022- April 2023 events

4.6.1 Field observations and field measurements

Table 20 Surface water observations and field measurements

Item	Observations and field measurements
Fieldwork dates	The surface water samples, and field parameters were collected on 22 December 2022, 25 January 2023, 21 February 2023, 27-28 March 2023 and 14 April 2023.

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<table>
<tr><th>Item</th><th>Observations and field measurements</th></tr>
<tr><td>Access and sample collection</td><td>During all events the surface water locations were accessible and able to be sampled with the exception of SW300 which was dry in December 2022.</td></tr>
<tr><td>Field observations</td><td>
<table>
<tr><th>Sample location</th><th>Date</th><th>Visual Flow rate</th></tr>
<tr><td>SW109</td><td>22/12/2022</td><td>High Flow</td></tr>
<tr><td></td><td>25/01/2023</td><td>High Flow</td></tr>
<tr><td></td><td>21/02/2023</td><td>High to Moderate Flow</td></tr>
<tr><td></td><td>14/04/2023</td><td>High Flow</td></tr>
<tr><td>SW312</td><td>22/12/2022</td><td>No Flow</td></tr>
<tr><td></td><td>25/01/2023</td><td>No Flow</td></tr>
<tr><td></td><td>21/02/2023</td><td>Low to Moderate Flow</td></tr>
<tr><td></td><td>14/04/2023</td><td>Low Flow</td></tr>
<tr><td>SW170</td><td>22/12/2022</td><td>No Flow</td></tr>
<tr><td></td><td>25/01/2023</td><td>Moderate to Low Flow</td></tr>
<tr><td></td><td>21/02/2023</td><td>Low Flow</td></tr>
<tr><td></td><td>14/04/2023</td><td>Low Flow</td></tr>
<tr><td>SW300</td><td>22/12/2022</td><td>No Flow</td></tr>
<tr><td></td><td>25/01/2023</td><td>Low Flow</td></tr>
<tr><td></td><td>21/02/2023</td><td>High to Moderate Flow</td></tr>
<tr><td></td><td>14/04/2023</td><td>Low Flow</td></tr>
</table>
</td></tr>
<tr><td>Rainfall</td><td>1566.2 mm of rainfall was reported for the Darwin Area (Darwin Airport weather station, 014015) during the wet season months- 519 mm in December 2022, 304.6 mm in January 2023, 500.8 mm in February 2023, 160.4 in March 2023, and 81.4 mm in April 2023 (Bureau of Meteorology, 2023).</td></tr>
<tr><td>Geochemical parameters</td><td>Surface water quality parameters for monitoring locations were measured after the collection of surface water samples. The stabilised readings are presented in Table T4 in Appendix B, and are summarised below:
DO ranged from 0.48 mg/L (SW170) (April 2023) to 6.81 mg/L (SW312) (December 2022) indicating low to moderate oxygenated conditions.
EC ranged from 22.9 µS/cm (SW312) (March 2023) to 157.9 µS/cm (SW312) (January 2023) indicating generally low salinity.
pH ranged from 5.01 (SW300) (January 2023) to 8.01 (SW312) (December 2022) indicating mildly acidic to mildly basic conditions.
Redox (corrected) ranged from 248.3 mV (SW312) (April 2023) to 370.0 mV (SW300) (January 2023) indicating oxidising conditions.</td></tr>
</table>

4.6.2 PFAS surface water analytical results

During the monthly in wet season sampling across all events sample from all locations reported PFAS concentrations above the laboratory LOR.

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There were no first-time detections or new exceedances of the adopted criteria at any of the sampled surface water monitoring locations The PFAS surface water analytical results from the PFAS mass-flux monthly in wet season sampling events are presented in **Table T5** in **Appendix B.**

Table 21 First-time detection of PFAS and new exceedances of guidelines in Base wide PFAS Mass-flux investigation

Type	Location ID	Sum of PFHxS + PFOS concentration (µg/L)		PFOA concentration (µg/L)		PFOS concentration (µg/L)	
		December 2022 to April 2023	Historical maximum	December 2022 to April 2023	Historical maximum	December 2022 to April 2023	Historical maximum
First-time detections of PFHxS+PFOS, PFOS or PFOA in surface water.	There were no first-time detections above the limit of reporting for PFHxS+PFOS or PFOA in surface water.						
New exceedance of NEMP 2.0 (HEPA, 2020) recreational use guideline values in surface water.	No new exceedances of the recreational use guideline for PFOA or sum PFOS+PFHxS were reported in surface water.						
New exceedance of NEMP 2.0 (HEPA, 2020) ecological water guideline value for surface water	No new exceedances of the ecological guideline PFOS and PFOA were reported in surface water, noting that the ecological guideline for PFOS is below the limit of reporting.						

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5.0 Summary and next sampling events

5.1 Summary of monitoring event

Sampling for the PFAS OMP during the reported monitoring period included:

- Annual sampling of biota from Rapid and Ludmilla Creeks for biota species. Biota sampling was conducted in October 2022; however, sample preparation and analysis was delayed. The biota results were reported in January 2023 and are therefore included in this report.
- Twice in wet season surface water sampling in November 2022 from 21 of 22 planned monitoring locations with an additional site sampled (SW300). Sample location SW152 was erroneously not sampled.
- Biannual gauging of groundwater levels at 34 of 34 planned monitoring wells and collection of groundwater samples (using Hydrasleeves™) from 34 of 34 planned monitoring wells in March 2023. Monitoring location MW422 was inaccessible due to construction activities occurring in the area therefore contingency well MW235 was sampled in lieu of MW422. Monitoring location MW144 was gauged, and a Hydrasleeve™ deployed however it was not retrieved until 20 April 2023
- Twice in wet season surface water sampling in March 2023 from all 24 planned locations.
- Monthly in wet season collection of surface water samples from four of four planned locations for the Base-wide Mass Flux PFAS Investigation from December 2022 to April 2023. Location SW300 was dry in December 2022.

The findings of the annual biota sampling event and the recommended actions are summarised in **Table 22** below.

Table 22 Summary of annual biota sampling event in October 2022, processed in January 2023

Item	Comment	Recommended actions
Access to sampling locations	All proposed monitoring locations were accessible.	Continue monitoring in accordance with the SAQP and PMAP.
Analytical Results	PFAS concentrations were recorded above the LOR at 6 of 6 biota locations.	Continue monitoring in accordance with the SAQP and PMAP.
New exceedance of adopted criteria for biota	No locations reported new exceedances of the adopted criteria.	Continue monitoring in accordance with the SAQP and PMAP.
First-time detection of PFAS in biota	No locations reported first-time detections of PFAS in biota.	Continue monitoring in accordance with the SAQP and PMAP.
Sum of PFHxS and PFOS and/or sum of PFAS concentrations show an increasing trend in biota	This will be evaluated in the annual interpretive report.	Continue monitoring in accordance with the SAQP and PMAP.
Sum of PFHxS and PFOS and/or sum of PFAS concentrations show a decreasing trend in biota	This will be evaluated in the annual interpretive report.	Continue monitoring in accordance with the SAQP and PMAP.

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The findings of the biannual groundwater sampling event and the recommended actions are summarised in **Table 23** below.

Table 23 Summary of March 2023 biannual groundwater sampling event

Item	Comment	Recommended actions
Access to sampling locations	All proposed monitoring locations were accessible with the exception of MW422, which was located within a restricted construction area. Contingency well MW235 was sampled in lieu.	Prior arrangements to be made with construction company to access site if necessary, in future visits. Continue monitoring in accordance with the SAQP and PMAP.
Monitoring well network condition	Monitoring well network was in good condition	Continue monitoring in accordance with the SAQP and PMAP.
Analytical Results	PFAS concentrations were recorded above the LOR at 33 of 34 groundwater monitoring wells sampled.	Continue monitoring in accordance with the SAQP and PMAP.
New exceedance of PFAS NEMP 2.0 (HEPA, 2020) drinking water guideline values in groundwater	No locations reported first-time detections or exceedance of the PFAS NEMP 2.0 (HEPA, 2020) drinking water guideline values.	Continue monitoring in accordance with the SAQP and PMAP.
First-time detection of PFAS in groundwater	No locations reported first-time detections.	Continue monitoring in accordance with the SAQP and PMAP.
Sum of PFHxS and PFOS and/or sum of PFAS concentrations show an increasing trend in groundwater.	This will be evaluated in the annual interpretive report.	Continue monitoring in accordance with the SAQP and PMAP. No actions recommended.
Sum of PFHxS and PFOS and/or sum of PFAS concentrations show a decreasing trend in groundwater.	This will be evaluated in the annual interpretive report.	Continue monitoring in accordance with the SAQP and PMAP.

The findings of the twice in wet season surface water sampling November 2022 event and the recommended actions are summarised in **Table 24** below.

Table 24 Summary of January twice in wet season surface water sampling event

Item	Comment	Recommended actions
Access to sampling locations	All proposed monitoring locations were accessible.	Continue monitoring in accordance with the SAQP and PMAP.
Analytical Results	PFAS concentrations were recorded above the LOR at 19 of 22 (including SW300) surface water monitoring locations.	Continue monitoring in accordance with the SAQP and PMAP.
New exceedance of PFAS NEMP 2.0 (HEPA, 2020)	No locations reported new exceedance of the PFAS NEMP	Continue monitoring in accordance with the SAQP and PMAP.

Item	Comment	Recommended actions
recreational guideline values in surface water	2.0 (HEPA, 2020) recreational guideline values	
First-time detection of PFAS in surface water	No locations reported first-time detections.	Continue monitoring in accordance with the SAQP and PMAP.
Sum of PFHxS and PFOS and/or sum of PFAS concentrations show an increasing trend in surface water.	This will be evaluated in the annual interpretive report.	Continue monitoring in accordance with the SAQP and PMAP.
Sum of PFHxS and PFOS and/or sum of PFAS concentrations show a decreasing trend in surface water.	This will be evaluated in the annual interpretive report.	Continue monitoring in accordance with the SAQP and PMAP.

The findings of the twice in wet season surface water sampling March 2023 event and the recommended actions are summarised in **Table 25** below.

Table 25 Summary of the March twice in wet season surface water sampling event

Item	Comment	Recommended actions
Access to sampling locations	All proposed monitoring locations were accessible.	Continue monitoring in accordance with the SAQP and PMAP.
Analytical Results	PFAS concentrations were recorded above the LOR at 23 of the 24 sampled surface water monitoring locations.	Continue monitoring in accordance with the SAQP and PMAP.
New exceedance of PFAS NEMP 2.0 (HEPA, 2020) recreational use guideline values in surface water	No locations reported new exceedance of the PFAS NEMP 2.0 (HEPA, 2020) recreational use guideline values	Continue monitoring in accordance with the SAQP and PMAP.
First-time detection of PFAS in surface water	No locations reported first-time detections.	Continue monitoring in accordance with the SAQP and PMAP.
Sum of PFHxS and PFOS and/or sum of PFAS concentrations show an increasing trend in surface water	This will be evaluated in the annual interpretive report.	Continue monitoring in accordance with the SAQP and PMAP.
Sum of PFHxS and PFOS and/or sum of PFAS concentrations show a decreasing trend in surface water	This will be evaluated in the annual interpretive report.	Continue monitoring in accordance with the SAQP and PMAP.

The findings of the monthly in wet season surface water sampling for PFAS Mass Flux from December 2022 to April 2023 events and the recommended actions are summarised in **Table 26.** below.

Table 26 Summary of the monthly in wet season PFAS Mass Flux surface water sampling events

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Item	Comment	Recommended actions
Access to sampling locations	All proposed monitoring locations were accessible and sampled with the exception of SW300 in December 2022.	Attempt to collect samples during high precipitation event for SW300. Continue monitoring in accordance with the SAQP and PMAP.
Analytical Results	PFAS concentrations were recorded above the LOR at all sampled surface water monitoring locations during all monthly events.	Continue monitoring in accordance with the SAQP and PMAP.
New exceedance of PFAS NEMP 2.0 (HEPA, 2020) recreational use guideline values in surface water	No locations reported new exceedance of the PFAS NEMP 2.0 (HEPA, 2020) recreational guideline values	Continue monitoring in accordance with the SAQP and PMAP.
First-time detection of PFAS in surface water	No locations reported first-time detections.	Continue monitoring in accordance with the SAQP and PMAP.

5.2 Upcoming sampling events

The next sampling events will consist of first and second monthly Off-base dry season surface water sampling scheduled for June and August 2023 respectively. Biannual end of dry season On-base and Off-base groundwater sampling scheduled for October 2023.

5.3 Upcoming annual interpretive report

The results presented in this report will be included in the 2023 Annual Interpretive Report, which will include data collected from May 2022 through April 2023.

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6.0 References

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Appendix A

Figures

D R A F T

Appendix A Figures

AECOM

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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.5 1 2

Kilometres

1:45,000 (when printed at A3)

LEGEND

- RAAF Base Darwin
- Source Area
- Management Area
- Drainage
- Highway

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 Esri

Department of Defence
RAAF BASE DARWIN
PFAS OMP WET SEASON SAMPLING EVENT FACTUAL REPORT 2023

Site and Management Area

PROJECT ID	60612561
CREATED BY	ROB.MCGREGOR
LAST MODIFIED	ROB.MCGREGOR 17 MAY 2023
VERSION:	1

Figure 1

A3 size

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AECOM

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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.2 0.4 0.6 0.8 1

Kilometers

1:20,000 (when printed at A3)

LEGEND

- RAAF Base Darwin
- Source Area
- Watercourses
- Highway
- Bi-annual Monitoring Locations

Note: MW235 was sampled as a contingency location for MW422

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

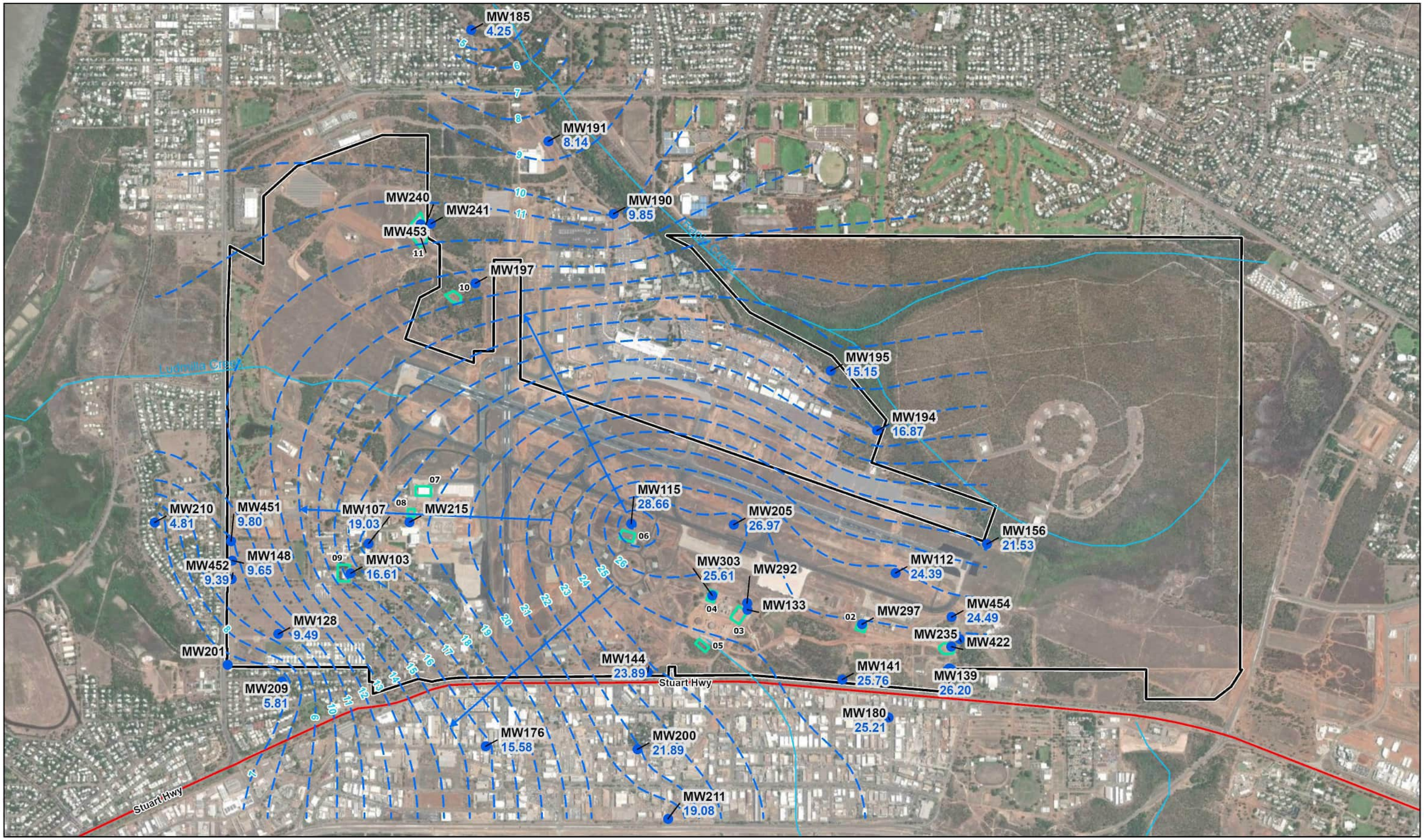
Department of Defence
RAAF BASE DARWIN
PFAS OMP WET SEASON SAMPLING EVENT FACTUAL REPORT 2023

Groundwater Sampling Locations

PROJECT ID	60612561
CREATED BY	ROB.MCGREGOR
LAST MODIFIED	ROB.MCGREGOR 06 JUN 2023
VERSION:	1

Figure 2

A3 size



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DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.2 0.4 0.6 0.8 1

Kilometers

1:20,000 (when printed at A3)

LEGEND

- RAAF Base Darwin
- Source Area
- Highway
- Watercourses
- Bi-annual Monitoring Locations
- Inferred Groundwater Level
- Inferred Groundwater Direction

ID	Inferred PFAS Source Area
01	Former Fire Training Ground 1
02	Former Fuel Farm 5
03	Former Fuel Farm 4
04	Former Fuel Farm 6
05	AFFF Contaminated Soil Stockpiles
06	Former ARFF Fire Station
07	Hanger 31
08	Former Fuel Farm 1
09	Former RAAF Fire Station
10	Former Fire Training Ground 2
11	Current Fire Training Ground

Data sources:

Base Data: Imagery (c) 2017 ESRI

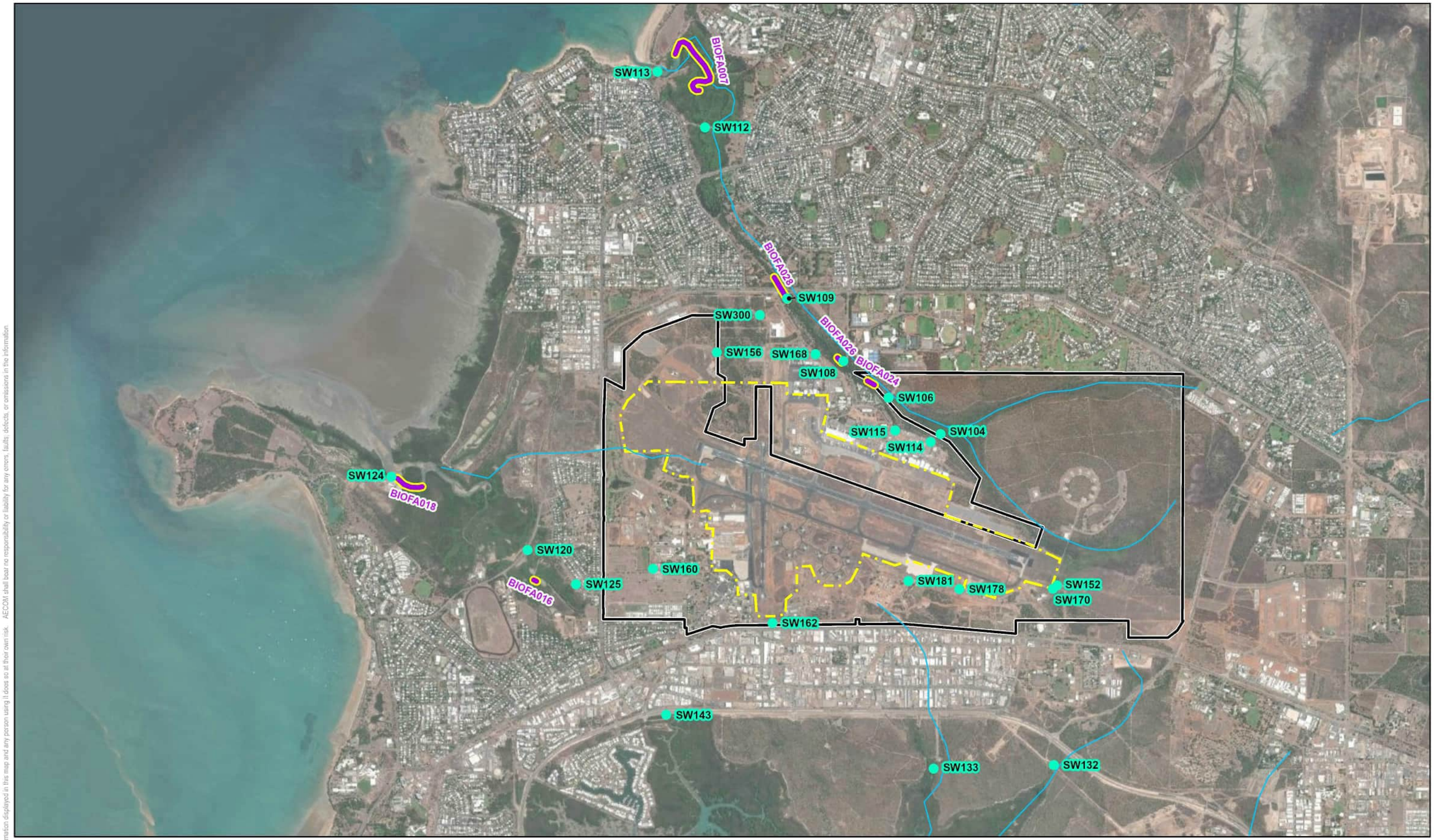
Department of Defence
RAAF BASE DARWIN
PFAS OMP WET SEASON SAMPLING EVENT FACTUAL REPORT 2023

Inferred Groundwater Contours

PROJECT ID	60612561
CREATED BY	ROB.MCGREGOR
LAST MODIFIED	ROB.MCGREGOR 31 MAY 2023
VERSION:	1

Figure 3

A3 size



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N

DATUM GDA 1994, PROJECTION MGA ZONE 52

0 0.2 0.4 0.6 0.8 1

Kilometers

1:35,000 (when printed at A3)

LEGEND

- RAAF Base Darwin
- RAAF Darwin Airside Zone
- Watercourses
- Surface Water Sample Locations
- Biota Sampling Location

Note:
- Biannual sampling consists of biannual end of wet season On-Base/Off-Base sampling event and biannual end of dry season On-Base/Off-Base sampling event.
- Monitoring locations SW170, SW300 and SW312 sampled monthly from December through April.
- Monitoring location SW109 sampled monthly from December through April, and in June and August.

Data sources:

Base Data: Imagery (c) 2017 ESRI

Department of Defence
RAAF BASE DARWIN
PFAS OMP WET SEASON SAMPLING EVENT FACTUAL REPORT 2023

On-going Monitoring Plan
Surface Water and Biota

PROJECT ID	60612561
CREATED BY	ROB.MCGREGOR
LAST MODIFIED	ROB.MCGREGOR 07 JUN 2023
VERSION	1

Figure 4

A3 size

Filename: \\na.aecomnet.com\LFS\APAC\Darwin-AUDWN1\Legacy\Projects\606x\60612561\900_CAD_GIS\920_GIS\60612561_Darwin_Def\02_MXDs\RAAF_Darwin\2023\01_2023_WSSEFR\G60612561_RAAFDarwin_01_2023_WSSEFR.aprx Layout: 60612561_01_2023_004_A3L

Appendix B

Tables

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Appendix B Tables

Table T1
Analytical Results
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Base Darwin

Biota - Analytical Results

AECOM

								Biota		PFAS Full Suite																													
								Number of specimens	Weight of Sample Prepared	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	Perfluorobutane sulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanesulfonic acid (PFDS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (FOSA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	PFOS - Branched	PFOS - Linear	Sum of PFAS	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorohexane sulfonic acid (PFHxS)
								-	g	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	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		0.1	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.005	0.001	0.002	0.001	0.005	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.005	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001
FSANZ 2017 2-6 years Crustaceans (all species)																																				**0.065**	**0.52**	**0.065**
FSANZ 2017 2-6 years Finfish (all species)																																				**0.005**	**0.041**	**0.005**
Location ID	**Field ID**	**Date**	**Lab Report**	**Fauna Group**	**Sample Type**	**Common Name**																																
BIOFA007	1302_BIOAFA289_221026	26/10/2022	ES2240147	Fish	Primary	Barramundi (Lates calcarifer)	1	131	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_QC144_221026	26/10/2022	ES2240147	Fish	Intra-lab Duplicate	Barramundi (Lates calcarifer)	1	126	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.002	<0.001	<0.001
	1302_BIOAFA290_221026	26/10/2022	ES2240147	Fish	Primary	Barramundi (Lates calcarifer)	1	99.8	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_QC145_221026	26/10/2022	ES2240147	Fish	Intra-lab Duplicate	Barramundi (Lates calcarifer)	1	95.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA291_221026	26/10/2022	ES2240147	Fish	Primary	Barramundi (Lates calcarifer)	1	116	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.003	0.004	<0.001	<0.001
	1302_QC146_221026	26/10/2022	ES2240147	Fish	Intra-lab Duplicate	Barramundi (Lates calcarifer)	1	106	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.007	0.008	**0.008**	<0.001	<0.001
	1302_BIOAFA292_221026	26/10/2022	ES2240147	Fish	Primary	Forktail Catfish 1 (Neoarius sp.1)	1	99	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.006	0.011	**0.007**	<0.001	0.004
	1302_QC147_221026	26/10/2022	ES2240147	Fish	Intra-lab Duplicate	Barramundi (Lates calcarifer)	1	99.9	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	0.002	0.004	0.002	<0.001	0.002
	1302_BIOAFA293_221026	26/10/2022	ES2240147	Fish	Primary	Forktail Catfish 1 (Neoarius sp.1)	1	69.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.004	0.002	<0.001	0.002
	1302_BIOAFA294_221026	26/10/2022	ES2240147	Fish	Primary	Forktail Catfish 1 (Neoarius sp.1)	1	56.8	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.002	0.005	0.003	<0.001	0.002
	1302_BIOAFA295_221026	26/10/2022	ES2240147	Fish	Primary	Forktail Catfish 2 (Neoarius sp.2)	1	102	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA296_221026	26/10/2022	ES2240147	Fish	Primary	Forktail Catfish 2 (Neoarius sp.2)	1	58.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.028	0.03	**0.03**	<0.001	<0.001
	1302_BIOAFA297_221026	26/10/2022	ES2240147	Fish	Primary	Forktail Catfish 2 (Neoarius sp.2)	1	54.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.003	0.032	0.036	**0.035**	<0.001	0.001
	1302_BIOAFA298_221026	26/10/2022	ES2240147	Fish	Primary	Banded Archerfish (Toxotes jaculatrix)	1	40.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.002	0.002	<0.001	<0.001
	1302_BIOAFA299_221026	26/10/2022	ES2240147	Fish	Primary	Banded Archerfish (Toxotes jaculatrix)	1	41.6	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA300_221026	26/10/2022	ES2240147	Fish	Primary	Sicklefish (Drepane punctata)	1	62.9	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	<0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA301_221026	26/10/2022	ES2240147	Fish	Primary	Sea Mullet (Mugil cephalus)	1	94.8	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA302_221026	26/10/2022	ES2240147	Fish	Primary	Sea Mullet (Mugil cephalus)	1	13.6	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.005	0.009	**0.009**	<0.001	<0.001
	1302_BIOAFA303_221026	26/10/2022	ES2240147	Fish	Primary	Sea Mullet (Mugil cephalus)	1	11.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.002	0.002	<0.001	<0.001
	1302_BIOAFA304_221026	26/10/2022	ES2240147	Fish	Primary	Sea Mullet (Mugil cephalus)	1	7.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.002	0.002	<0.001	<0.001
	1302_BIOAFA305_221026	26/10/2022	ES2240147	Crustacean	Primary	Orange Mud Crab (Scylla olivacea)	1	68.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
BIOFA016	1302_BIOAFA284_221029	29/10/2022	ES2240147	Invertebrate	Primary	Long Bum (Telescopium telescopium)	1	30.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.007	0.008	0.007	0.001	<0.001
	1302_BIOAFA285_221029	29/10/2022	ES2240147	Invertebrate	Primary	Long Bum (Telescopium telescopium)	1	35	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.005	0.007	0.006	0.001	<0.001
	1302_BIOAFA286_221029	29/10/2022	ES2240147	Invertebrate	Primary	Long Bum (Telescopium telescopium)	1	31.5	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.017	0.021	0.018	0.003	<0.001
	1302_BIOAFA287_221029	29/10/2022	ES2240147	Invertebrate	Primary	Giant Mangrove Whelk (Terebralia palustris)	1	57.9	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.014	0.016	0.016	<0.001	<0.001
	1302_BIOAFA288_221029	29/10/2022	ES2240147	Invertebrate	Primary	Giant Mangrove Whelk (Terebralia palustris)	1	60.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	0.004	0.004	0.004	<0.001	<0.001
BIOFA018	1302_BIOAFA258_221025	25/10/2022	ES2240147	Fish	Primary	Barramundi (Lates calcarifer)	1	116	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_QC140_221025	25/10/2022	ES2240147	Fish	Intra-lab Duplicate	Barramundi (Lates calcarifer)	1	119	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA259_221025	25/10/2022	ES2240147	Fish	Primary	Barramundi (Lates calcarifer)	1	95.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_QC141_221025	25/10/2022	ES2240147	Fish	Intra-lab Duplicate	Barramundi (Lates calcarifer)	1	110	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA260_221025	25/10/2022	ES2240147	Fish	Primary	Barramundi (Lates calcarifer)	1	109	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_QC142_221025	25/10/2022	ES2240147	Fish	Intra-lab Duplicate	Barramundi (Lates calcarifer)	1	109	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA261_221025	25/10/2022	ES2240147	Fish	Primary	Barramundi (Lates calcarifer)	1	100	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_QC143_221025	25/10/2022	ES2240147	Fish	Intra-lab Duplicate	Barramundi (Lates calcarifer)	1	98.9	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA262_221025	25/10/2022	ES2240147	Fish	Primary	Barramundi (Lates calcarifer)	1	107	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA263_221025	25/10/2022	ES2240147	Fish	Primary	Barramundi (Lates calcarifer)	1	110	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA264_221025	25/10/2022	ES2240147	Fish	Primary	Barramundi (Lates calcarifer)	1	60.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA265_221025	25/10/2022	ES2240147	Fish	Primary	Barramundi (Lates calcarifer)	1	57.5	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA266_221025	25/10/2022	ES2240147	Fish	Primary	Forktail Catfish 1 (Neoarius sp.1)	1	41.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA267_221025	25/10/2022	ES2240147	Fish	Primary	Forktail Catfish 1 (Neoarius sp.1)	1	43.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA268_221025	25/10/2022	ES2240147	Fish	Primary	Forktail Catfish 1 (Neoarius sp.1)	1	45.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA269_221025	25/10/2022	ES2240147	Fish	Primary	Forktail Catfish 2 (Neoarius sp.2)	1	74.9	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA270_221025	25/10/2022	ES2240147	Fish	Primary	Forktail Catfish 2 (Neoarius sp.2)	1	65	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.002	0.002	<0.001	<0.001
	1302_BIOAFA271_221025	25/10/2022	ES2240147	Fish	Primary	Forktail Catfish 2 (Neoarius sp.2)	1	64.9	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA272_221025	25/10/2022	ES2240147	Fish	Primary	Australian Giant Herring (Elops machnata)	1	90.2	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA273_221025	25/10/2022	ES2240147	Fish	Primary	Sea Mullet (Mugil cephalus)	1	70.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.035	0.012	0.047	**0.047**	<0.001	<0.001
	1302_BIOAFA274_221025	25/10/2022	ES2240147	Fish	Primary	Sea Mullet (Mugil cephalus)	1	50.5	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.005	0.003	0.008	**0.008**	<0.001	<0.001
	1302_BIOAFA275_221025	25/10/2022	ES2240147	Fish	Primary	Sea Mullet (Mugil cephalus)	1	40.6	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	<0.001	0.002	0.002	<0.001	<0.001
	1302_BIOAFA276_221025	25/10/2022	ES2240147	Crustacean	Primary	Sand Crab (Portunus pelagicus)	1	20.9	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.004	0.002	0.001	0.001
	1302_BIOAFA277_221025	25/10/2022	ES2240147	Crustacean	Primary	Sand Crab (Portunus pelagicus)	1	21.8	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	<0.001	0.003	0.001	<0.001	0.002
	1302_BIOAFA278_221025	25/10/2022	ES2240147	Crustacean	Primary	Sand Crab (Portunus pelagicus)	1	36.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA279_221025	25/10/2022	ES2240147	Fish	Primary	Scat (Scatophagus sp.)	1	52.5	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA280_221025	25/10/2022	ES2240147	Fish	Primary	Scat (Scatophagus sp.)	1	40.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA281_221025	25/10/2022	ES2240147	Fish	Primary	Scat (Scatophagus sp.)	1	33.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA282_221025	25/10/2022	ES2240147	Fish	Primary	Brown Sweetlips (Plectorhinchus gibbosus)	1	35.6	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA283_221025	25/10/2022	ES2240147	Fish	Primary	Pikey Bream (Acanthopagrus pacificus)	1	31.1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002

Table T2
Field Results
PFAS Ongoing Monitoring Program
Department of Defence- RAAF Base Darwin

Groundwater - Field Results

AECOM

Frequency	Location ID	Date	Depth to Water (mbTOC)	Well Depth (mbTOC)	TOC (mAHD)	Water Elevation (mAHD)	Condition of Gatic	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Redox (mV)	Temp (^{o}C)	Clarity	Water Colour	Odour	Sheen	Sample Method
Biannual	MW103	17/03/2023	2.940	12.10	19.55	16.61	Good	1.06	86	52	4.95	75.7	30.9	Moderate	Orange	No odour	No sheen	Hydrasleeve
	MW107	17/03/2023	2.910	14.54	21.94	19.03	Good	0.78	74	45	4.41	103.5	31.1	High	Brown	No odour	No sheen	Hydrasleeve
	MW112	13/03/2023	2.580	13.55	26.97	24.39	Good	1.07	264	158	5.89	63.2	30.2	High	Brown	No odour	No sheen	Hydrasleeve
	MW115	13/03/2023	3.750	14.73	32.41	28.66	Good	1.96	70	42	5.67	59.8	29.3	High	Brown	No odour	No sheen	Hydrasleeve
	MW128	17/03/2023	1.900	12.27	11.39	9.49	Good	1.09	80	48	5.29	57.4	30.4	Moderate	Orange	No odour	No sheen	Hydrasleeve
	MW133	15/03/2023	NM	NM	30.90	-	Good	1.92	46	27	4.80	55.1	33.7	Moderate	Grey	No odour	No sheen	Hydrasleeve
	MW139	16/03/2023	2.350	15.43	28.55	26.20	Good	0.88	544	326	5.06	39.4	30.3	High	Brown	No odour	No sheen	Hydrasleeve
	MW141	16/03/2023	4.340	14.83	30.10	25.76	Good	2.10	57	34	4.81	62.5	31.4	High	Brown	No odour	No sheen	Hydrasleeve
	MW144	20/04/2023^	6.800	14.70	30.69	23.89	Good	0.15	31	18	6.86	130.6	26.5	High	Brown	No odour	No sheen	Hydrasleeve
	MW148	17/03/2023	2.510	11.40	12.16	9.65	Good	0.98	102	61	5.61	93.2	31.2	Moderate	Brown	No odour	No sheen	Hydrasleeve
	MW156	13/03/2023	1.510	11.90	23.04	21.53	Good	4.01	53	32	4.48	76.2	31.9	High	Brown	No odour	No sheen	Hydrasleeve
	MW176	16/03/2023	3.160	11.67	18.74	15.58	Good	1.56	38	23	4.70	95.4	29.9	High	Brown	No odour	No sheen	Hydrasleeve
	MW180	16/03/2023	3.850	14.82	29.06	25.21	Good	2.51	38	23	4.95	97.1	30.6	High	Brown	No odour	No sheen	Hydrasleeve
	MW185	17/03/2023	1.570	10.35	5.82	4.25	Good	1.83	96	57	5.67	60.7	30.6	High	Brown	No odour	No sheen	Hydrasleeve
	MW190	17/03/2023	1.490	12.39	11.34	9.85	Good	1.52	73	44	5.04	72.6	31.7	High	Brown	No odour	No sheen	Hydrasleeve
	MW191	17/03/2023	2.770	12.69	10.91	8.14	Good	2.07	116	70	5.38	55.1	30.7	High	Brown	No odour	No sheen	Hydrasleeve
	MW194	17/03/2023	1.370	12.40	18.24	16.87	Good	0.81	92	55	5.61	37.8	30.4	Moderate	Orange	No odour	No sheen	Hydrasleeve
	MW195	17/03/2023	1.590	11.16	16.74	15.15	Good	0.89	98	59	5.60	14.7	30.3	Moderate	Brown	No odour	No sheen	Hydrasleeve
	MW197	13/03/2023	3.740	7.65	NA	-	Good	2.44	33	20	4.45	15.2	29.1	High	Brown	No odour	No sheen	Hydrasleeve
	MW200	16/03/2023	4.340	11.63	26.23	21.89	Good	4.38	52	31	4.42	108.3	30.6	High	Brown	No odour	No sheen	Hydrasleeve
	MW205	13/03/2023	2.600	14.88	29.57	26.97	Good	1.71	40	24	4.70	56.3	29.4	High	Brown	No odour	No sheen	Hydrasleeve
	MW209	16/03/2023	1.160	11.50	6.97	5.81	Good	1.23	56	34	4.46	90.6	29.8	High	Brown	No odour	No sheen	Hydrasleeve
	MW210	16/03/2023	2.100	11.75	6.91	4.81	Good	0.73	299	179	6.20	58.6	30.9	High	Grey	Hydrocarbon	No sheen	Hydrasleeve
	MW211	16/03/2023	3.430	14.94	22.51	19.08	Good	0.99	32	19	4.62	72.3	30.2	High	Brown	No odour	No sheen	Hydrasleeve
	MW215	17/03/2023	5.110	15.22	NA	-	Good	0.90	94	56	5.38	108.2	31.2	High	Brown	No odour	No sheen	Hydrasleeve
	MW235	16/03/2023	1.870	13.90	NA	-	Good	2.21	141	84	3.87	37.0	30.9	Moderate	Brown	No odour	No sheen	Hydrasleeve
	MW240	13/03/2023	2.220	14.21	NA	-	No cap	4.21	31	18	4.59	-22.1	30.3	High	Brown	No odour	No sheen	Hydrasleeve
	MW241	13/03/2023	1.820	14.45	NA	-	Good	4.17	85	51	4.61	-75.0	30	High	Brown	No odour	No sheen	Hydrasleeve
	MW297	13/03/2023	NM	NM	29.53	-	Good	4.01	35	21	4.80	49.7	30.6	High	Grey	No odour	No sheen	Hydrasleeve
	MW303	16/03/2023	6.330	15.46	31.94	25.61	Good	1.94	44	27	4.71	67.7	31.8	High	Brown	No odour	No sheen	Hydrasleeve
	MW451	17/03/2023	3.180	15.60	12.98	9.80	Good	0.73	77	46	4.73	106.3	31.6	Moderate	Brown	No odour	No sheen	Hydrasleeve
	MW452	17/03/2023	2.000	13.35	11.39	9.39	Good	4.01	35	21	4.52	49.3	30.6	Moderate	Brown	No odour	No sheen	Hydrasleeve
	MW453	13/03/2023	1.720	15.08	NA	-	Good	3.61	31	19	4.29	65.7	30.7	Moderate	Grey	No odour	No sheen	Hydrasleeve
	MW454	16/03/2023	1.780	12.01	26.27	24.49	Good	1.28	157	94	4.68	64.1	29.5	Low	Orange	No odour	No sheen	Hydrasleeve

Notes:
mbTOC: metres below top of casing
mAHD: metres Australia Height Datum
ND: not detected
NM: not measured
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
^{o}C: degrees celcius
^ : MW144 gauged on the 16/03/23 and gauged and sampled on the 20/04/23., Gauging data used from initial gauging event.

Table 3
Analytical Results
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Base Darwin

Groundwater - Analytical Results

					PFAS Full Suite																													
					10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	Perfluorobutane sulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanesulfonic acid (PFDS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (FOSA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Sum of PFAS	Sum of PFHxS and PFOS	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorohexane sulfonic acid (PFHxS)
					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
				LOR	0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2020 Drinking Water																															**0.07**		**0.56**	
Location Code	**Date**	**Field ID**	**Lab Report**	**Sample Type**																														
MW103	23/03/2023	1302_MW103_230323	ES2310999	Primary	<0.05	<0.05	4.62	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	0.2	<0.02	<0.02	<0.02	0.29	0.16	1.14	<0.02	<0.02	0.26	1.09	<0.05	<0.02	<0.02	22.3	**14.1**	*10.9*	0.23	3.21
MW107	23/03/2023	1302_MW107_230323	ES2310999	Primary	<0.05	<0.05	3.92	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.25	0.3	<0.02	<0.02	<0.02	0.31	0.16	1.12	<0.02	<0.02	0.32	1.09	<0.05	<0.02	<0.02	19.5	**11.8**	*8.66*	0.22	3.18
MW112	14/03/2023	1302_MW112_230314	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	<0.1	<0.02	<0.02	<0.02	0.12	0.07	0.6	<0.02	<0.02	0.23	0.11	<0.05	<0.02	<0.02	9.74	**8.23**	*6.42*	0.15	1.81
MW115	14/03/2023	1302_MW115_230314	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.47	0.2	0.06	<0.02	<0.02	1.39	0.34	3.16	<0.02	0.1	2.12	0.56	<0.05	<0.02	<0.02	74	**63.6**	*47.3*	**1.01**	16.3
MW115	14/03/2023	1302_QC100_230314	ES2310999	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.63	0.2	0.07	<0.02	<0.02	1.65	0.38	3.51	<0.02	0.1	2.35	0.63	<0.05	<0.02	<0.02	76.2	**64.5**	*47.6*	**1.14**	16.9
MW115	14/03/2023	1302_QC200_230314	RN1389152	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	1.3	0.27	<0.01	<0.01	<0.01	0.99	0.27	2.3	<0.01	0.03	1.4	0.44	<0.02	<0.02	<0.01	21.7	**44**	*30*	**0.79**	14
MW128	23/03/2023	1302_MW128_230323	ES2310999	Primary	<0.05	<0.05	0.15	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.1	0.04	0.28	<0.02	<0.02	0.13	0.1	<0.05	<0.02	<0.02	6.53	**5.52**	*4.23*	0.1	1.29
MW133	15/03/2023	1302_MW133_230315	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.45	0.2	0.1	<0.02	<0.02	0.92	0.21	1.92	<0.02	0.06	0.73	0.39	<0.05	<0.02	<0.02	42.9	**37.4**	*30.4*	**0.56**	6.98
MW139	22/03/2023	1302_MW139_230322	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.59	**0.56**	*0.42*	<0.01	0.14
MW141	22/03/2023	1302_MW141_230322	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.45	**0.45**	*0.25*	<0.01	0.2
MW148	23/03/2023	1302_MW148_230323	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.18	0.04	0.23	<0.02	<0.02	0.21	0.06	<0.05	<0.02	<0.02	9.72	**8.74**	*6.59*	0.1	2.15
MW156	14/03/2023	1302_MW156_230314	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.3	<0.1	<0.02	<0.02	<0.02	0.18	0.07	0.64	<0.02	<0.02	0.32	0.14	<0.05	<0.02	<0.02	10.5	**8.72**	*5.98*	0.16	2.74
MW176	20/03/2023	1302_MW176_230320	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.12	**0.12**	*0.08*	<0.01	0.04
MW176	20/03/2023	1302_QC101_230320	ES2310999	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.17	**0.17**	*0.12*	<0.01	0.05
MW176	20/03/2023	1302_QC201_230320	RN1389152	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	0.093	**0.093**	*0.058*	<0.01	0.035
MW180	20/03/2023	1302_MW180_230320	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.09	**0.09**	*0.01*	<0.01	0.08
MW180	20/03/2023	1302_QC100_230320	ES2310999	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.11	**0.11**	*0.02*	<0.01	0.09
MW180	20/03/2023	1302_QC200_230320	RN1389152	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	0.07	**0.07**	<0.02	<0.01	0.065
MW185	20/03/2023	1302_MW185_230320	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.05	0.05	*0.04*	<0.01	0.01
MW190	20/03/2023	1302_MW190_230320	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.52	**0.49**	*0.36*	0.01	0.13
MW191	20/03/2023	1302_MW191_230320	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.12	<0.02	<0.02	0.07	0.04	<0.05	<0.02	<0.02	3.02	**2.65**	*1.87*	0.04	0.78
MW194	20/03/2023	1302_MW194_230320	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.22	<0.02	<0.02	0.1	0.06	<0.05	<0.02	<0.02	5.4	**4.75**	*3.66*	0.07	1.09
MW195	20/03/2023	1302_MW195_230320	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	1.41	**1.27**	*0.92*	0.02	0.35
MW197	23/03/2023	1302_MW197_230323	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.12	0.06	0.47	<0.02	<0.02	0.21	0.08	<0.05	<0.02	<0.02	8.4	**7.2**	*4.89*	0.12	2.31
MW200	20/03/2023	1302_MW200_230320	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.84	**0.76**	*0.46*	<0.01	0.3
MW205	14/03/2023	1302_MW205_230314	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.07	0.03	0.24	<0.02	<0.02	0.16	0.05	<0.05	<0.02	<0.02	3.82	**3.04**	*1.84*	0.07	1.2
MW209	20/03/2023	1302_MW209_230320	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	*<0.01**	<0.01	<0.01
MW210	20/03/2023	1302_MW210_230320	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.06	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	2.1	**1.91**	*1.47*	0.02	0.44
MW211	20/03/2023	1302_MW211_230320	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.04	0.04	*0.03*	<0.01	0.01
MW215	23/03/2023	1302_MW215_230323	ES2310999	Primary	<0.05	<0.05	3.5	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.2	0.2	<0.02	<0.02	<0.02	0.24	0.12	0.74	<0.02	<0.02	0.28	0.75	<0.05	<0.02	<0.02	15.5	**9.32**	*6.3*	0.15	3.02
MW235	22/03/2023	1302_MW235_230322	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.69	0.1	0.08	<0.02	<0.02	0.52	0.2	1.83	<0.02	0.04	0.83	0.42	<0.05	<0.02	<0.02	37.8	**32.7**	*25.6*	0.48	7.06
MW240	23/03/2023	1302_MW240_230323	ES2310999	Primary	<0.05	<0.05	0.38	1.96	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.05	1.4	0.04	0.17	<0.02	0.48	2.94	4.52	0.93	0.05	1.15	2.18	<0.05	<0.02	<0.02	44.8	**24.7**	*17.8*	**2.85**	6.88
MW241	23/03/2023	1302_MW241_230323	ES2310999	Primary	<0.05	<0.05	0.25	1.41	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.81	1.2	<0.02	0.1	<0.02	0.43	3.46	3.52	0.86	<0.02	0.6	2.32	<0.05	<0.02	<0.02	44.7	**27**	*21.6*	**2.7**	5.4
MW297	14/03/2023	1302_MW297_230314	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.03	0.02	0.16	<0.02	<0.02	0.07	0.03	<0.05	<0.02	<0.02	2.43	**2.02**	*1.32*	0.05	0.7
MW303	22/03/2023	1302_MW303_230322	ES2310999	Primary	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.01	0.7	<0.02	<0.02	<0.02	2.05	0.85	8.26	<0.02	0.02	4.16	1.32	<0.05	<0.02	<0.02	77.1	**54.9**	*26.8*	**1.8**	28.1
MW451	23/03/2023	1302_MW451_230323	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.05	<0.02	0.09	<0.02	<0.02	0.08	0.03	<0.05	<0.02	<0.02	2.73	**2.38**	*1.54*	0.04	0.84
MW452	23/03/2023	1302_MW452_230323	ES2310999	Primary	<0.05	<0.05	0.63	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.11	0.08	0.39	<0.02	<0.02	0.19	0.23	<0.05	<0.02	<0.02	6.59	**4.74**	*2.91*	0.09	1.83
MW453	23/03/2023	1302_MW453_230323	ES2310999	Primary	<0.05	<0.05	0.53	0.18	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.35	1.7	<0.02	<0.02	<0.02	0.37	4.07	6.07	0.35	<0.02	1.37	2.75	<0.05	<0.02	<0.02	34.8	**12.6**	*5.26*	**3.42**	7.35
MW454	22/03/2023	1302_MW454_230322	ES2310999	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.31	0.3	<0.02	<0.02	<0.02	1.18	0.23	2.15	<0.02	<0.02	1.84	0.5	<0.05	<0.02	<0.02	48.9	**40.8**	*28.2*	**0.57**	12.6
MW454	22/03/2023	1302_QC102_230322	ES2310999	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.35	0.3	<0.02	<0.02	<0.02	1.28	0.25	2.23	<0.02	<0.02	1.84	0.53	<0.05	<0.02	<0.02	49.3	**40.9**	*28*	**0.59**	12.9
MW454	22/03/2023	1302_QC202_230322	RN1389152	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	1	0.23	<0.01	<0.01	<0.01	0.48	0.18	1.6	<0.01	<0.01	1.1	0.36	<0.02	<0.02	<0.01	27.15	**22.2**	*14*	0.36	8.2

Notes:
µg/L: micrograms per litre
LOR: limit of reporting
* LOR is above guideline value
Denotes first time detection above LOR for Sum of PFHxS+PFOS or PFOA
Denotes new exceedance of human health screening criteria

Table T4
Field Results
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Base Darwin

Surface Water - Field Results

AECOM

Frequency	Location ID	Sampled Date	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Redox (mV)	Redox corrected (mV)	Temp (°C)	Clarity	Water Colour	Odour	Sheen	Sample Method
Biannual	SW104	23/11/2022	1.04	38.4	24.6	5.53	48.1	248.1	27.8	High	Colourless	No odour	No sheen	Grab
	SW106	23/11/2022	-	76.7	49.1	5.43	72.4	272.4	29.3	High	Colourless	No odour	No sheen	Grab
	SW108	23/11/2022	-	68.4	43.8	5.22	23.9	223.9	29.2	Moderate	Pale Brown	No odour	No sheen	Grab
	SW109	23/11/2022	-	75.9	48.6	5.71	49.3	249.3	29.6	Moderate	Pale Brown	No odour	No sheen	Grab
	SW112	23/11/2022	-	13292.0	8506.9	7.20	19.8	219.8	31.1	High	Colourless	No odour	No sheen	Grab
	SW113	23/11/2022	0.45	49197.0	31486.1	7.88	-56.4	143.6	31.1	High	Colourless	No odour	No sheen	Grab
	SW114	23/11/2022	-	15.9	10.2	5.70	72.9	272.9	31.6	High	Colourless	No odour	No sheen	Grab
	SW115	23/11/2022	-	67.4	43.1	6.71	84.1	284.1	31.2	High	Colourless	No odour	No Sheen	Grab
	SW120	23/11/2022	-	29354.0	18786.6	7.48	-0.6	199.4	29.2	High	Colourless	No odour	No sheen	Grab
	SW124	23/11/2022	0.10	58105.0	37187.2	7.78	36.6	236.6	30.2	High	Colourless	No odour	No sheen	Grab
	SW125	23/11/2022	1.21	84.4	54.0	8.72	100.6	300.6	30.3	High	Colourless	No odour	No sheen	Grab
	SW132	24/11/2022	-	69.2	44.3	5.47	60.6	260.6	28.4	High	Colourless	No odour	Sheen	Grab
	SW133	24/11/2022	-	138.0	88.3	6.47	49.2	249.2	28.5	Moderate	Pale Brown	No odour	No sheen	Grab
	SW143	24/11/2022	0.93	45286.0	28983.0	7.43	62.1	262.1	31.1	High	Colourless	No odour	No sheen	Grab
	SW156	23/11/2022	-	78.5	50.2	5.72	38.4	238.4	34.3	Low	Brown	No odour	No sheen	Grab
	SW160	25/11/2022	1.20	40.9	26.2	5.30	-75.0	125.0	30.1	Moderate	Pale Brown	No odour	No sheen	Grab
	SW162	25/11/2022	0.94	19.8	12.7	6.31	29.1	229.1	30.4	Moderate	Pale Brown	No odour	No sheen	Grab
	SW168	23/11/2022	0.62	43.7	28.0	5.47	81.0	281.0	32.0	Moderate	Pale Brown	No odour	No sheen	Grab
	SW170	24/11/2022	0.96	53.1	34.0	7.00	17.6	217.6	29.6.	Moderate	Browny Orange	No odour	No sheen	Grab
	SW178	25/11/2022	-	67.9	43.5	6.79	7.2	207.2	29.0	Moderate	Pale Brown	No odour	No sheen	Grab
	SW181	25/11/2022	1.87	13.1	8.4	5.22	-70.0	130.0	31.0	Moderate	Pale Brown	No odour	No sheen	Grab
	SW300	25/11/2022	0.83	20.0	12.8	5.82	-97.6	102.4	29.0	Moderate	Pale Brown	No odour	No sheen	Grab
December Mass-Flux	SW109	22/12/2022	4.83	37.8	24.2	5.80	167.8	367.8	26.5	High	Colourless	No odour	Sheen	Grab
	SW170	22/12/2022	5.30	37.8	24.2	6.37	163.3	363.3	26.0	High	Colourless	No odour	Sheen	Grab
	SW312	22/12/2022	6.81	38.2	24.4	8.01	104.3	304.3	26.3	High	Colourless	No odour	Sheen	Grab
January Mass-Flux	SW109	25/01/2023	3.89	156.2	100.0	5.44	156.3	356.3	28.3	High	Colourless	No odour	No sheen	Grab
	SW170	25/01/2023	3.50	95.3	61.0	5.72	161.3	361.3	29.8	Moderate	Pale brown	No odour	No sheen	Grab
	SW300	25/01/2023	4.04	157.9	101.1	5.01	170.0	370.0	27.7	High	Colourless	No odour	No sheen	Grab
	SW312	25/01/2023	4.55	82.7	52.9	7.18	148.6	348.6	28.8	High	Colourless	No odour	No sheen	Grab
February Mass-Flux	SW109	23/02/2023	6.45	41.9	26.8	6.17	53.9	253.9	29.4	High	Colourless	No odour	No sheen	Grab
	SW170	21/02/2023	6.59	29.3	18.8	6.67	68.2	268.2	27.8	Moderate	pale brown	No odour	No sheen	Grab
	SW312	21/02/2023	6.59	24.9	15.9	6.40	63.5	263.5	28.3	High	Colourless	No odour	No sheen	Grab
	SW300	21/02/2023	6.57	37.0	23.7	6.13	76.7	276.7	28.6	High	Colourless	No odour	No sheen	Grab
Biannual	SW104	27/03/2023	2.3	29.9	17.94	5.37	67.2	267.2	31.6	High	Colourless	No odour	No sheen	Grab
	SW106	27/03/2023	3.95	46.2	27.72	6.26	53.3	253.3	30.4	High	Colourless	No odour	No sheen	Grab
	SW108	27/03/2023	4.08	47.6	28.56	5.69	74.8	274.8	29.9	High	Colourless	No odour	No sheen	Grab
	SW109	27/03/2023	3.91	49.4	31.6	5.67	83.6	283.6	30.1	High	Colourless	No odour	No sheen	Grab
	SW112	28/03/2023	3.79	453.9	272.34	6.81	100.7	300.7	27.9	Moderate	Colourless	No odour	No sheen	Grab
	SW113	28/03/2023	4.03	8889	5333.4	6.79	127.1	327.1	28.5	Moderate	Colourless	No odour	No sheen	Grab
	SW114	27/03/2023	3.6	52.2	31.32	5.56	84.7	284.7	31.4	High	Colourless	No odour	Organic	Grab
	SW115	27/03/2023	3.34	37.9	22.74	6.23	67.4	267.4	30.3	High	Colourless	No odour	No sheen	Grab
	SW120	28/03/2023	3.04	3520.8	2112.48	7.01	115.3	315.3	28.7	High	Colourless	No odour	No sheen	Grab
	SW124	28/03/2023	3.63	3129	1877.4	7.71	108.3	308.3	30.2	Moderate	Colourless	No odour	No sheen	Grab
	SW125	28/03/2023	4.76	344.7	206.82	7.27	68.2	268.2	30.3	High	Colourless	No odour	No sheen	Grab
	SW132	27/03/2023	3.42	52.3	31.38	6.18	33.1	233.1	28.2	High	Colourless	No odour	No sheen	Grab
	SW133	27/03/2023	3.35	22.4	13.44	6.85	48.1	248.1	29.6	High	Colourless	No odour	No sheen	Grab
	SW143	28/03/2023	4.06	5779	3467.4	7.35	103.6	303.6	31.6	High	Colourless	No odour	No sheen	Grab
	SW152	28/03/2023	3.91	51.8	31.08	5.73	98.1	298.1	27.2	Moderate	Colourless	No odour	No sheen	Grab
	SW156	28/03/2023	4.55	31.3	18.78	6.56	85.6	285.6	28.9	High	Colourless	No odour	No sheen	Grab
	SW160	28/03/2023	3.07	44.8	26.88	6.26	99.6	299.6	29.5	High	Colourless	No odour	No sheen	Grab
	SW162	28/03/2023	3.94	24.9	14.94	6.29	102.6	302.6	25.6	Moderate	Colourless	No odour	No sheen	Grab
	SW168	27/03/2023	3.53	49.5	29.7	5.15	86.2	286.2	33.9	Moderate	Colourless	No odour	No sheen	Grab
	SW170	28/03/2023	3.93	24.0	15.4	6.21	100.7	300.7	24.9	Moderate	Browny orange	No odour	No sheen	Grab
	SW178	28/03/2023	4.41	31.2	18.72	6.65	106.6	306.6	25.5	Moderate	Colourless	No odour	No sheen	Grab
	SW181	28/03/2023	4.58	27.1	16.26	6.46	103.6	303.6	25.4	Moderate	Colourless	No odour	No sheen	Grab
	SW300	27/03/2023	3.38	53.9	34.5	5.63	78	278.0	32.4	High	Colourless	No odour	No sheen	Grab
	SW312	28/03/2023	4.79	22.9	14.7	6.43	99.0	299.0	26.3	Moderate	Colourless	No odour	No sheen	Grab
March Mass-Flux	SW109	27/03/2023	3.91	49.4	31.6	5.67	83.6	283.6	30.1	High	Colourless	No odour	No sheen	Grab
	SW170	28/03/2023	3.93	24.0	15.4	6.21	100.7	300.7	24.9	Moderate	Browny orange	No odour	No sheen	Grab
	SW300	27/03/2023	3.38	53.9	34.5	5.63	78	278.0	32.4	High	Colourless	No odour	No sheen	Grab
	SW312	28/03/2023	4.79	22.9	14.7	6.43	99.0	299.0	26.3	Moderate	Colourless	No odour	No sheen	Grab
April Mass-Flux	SW109	14/04/2023	4.72	45.3	29.0	5.69	83.2	283.2	28.4	High	Colourless	No odour	No sheen	Grab
	SW170	14/04/2023	0.48	49.9	31.9	6.80	83.9	283.9	27.8	Moderate	Pale Brown	No odour	No sheen	Grab
	SW300	14/04/2023	5.12	57.4	36.7	5.64	82.9	282.9	30.4	High	Colourless	No odour	No sheen	Grab
	SW312	14/04/2023	0.61	29.0	18.6	6.89	48.3	248.3	27.8	High	Colourless	No odour	No sheen	Grab

Notes:
mg/L: milligram per Litre
µS/cm: microsiemens per centimetre
mV: millivolts
°C: degrees celcius

Table T5
Analytical Results
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Base Darwin

Surface Water - Analytical Results

AECOM

														PFAS Full Suite																							
														10:2 Fluorotelomer sulfonic acid (10:2 FTS)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FtS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	Perfluorobutane sulfonic acid (PFBS)	Perfluorobutanoic acid (PFBA)	Perfluorodecanesulfonic acid (PFDS)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoDA)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluoroheptanoic acid (PFHpA)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorooctane sulfonamide (FOSA)	Perfluoropentane sulfonic acid (PFPeS)	Perfluoropentanoic acid (PFPeA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnDA)	Sum of PFAS	Sum of PFHxS and PFOS	Perfluorooctane sulfonic acid (PFOS)	Perfluorooctanoic Acid (PFOA)	Perfluorohexane sulfonic acid (PFHxS)
														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	0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2020 Freshwater 99%																																		*0.00023*	*19*	
PFAS NEMP 2020 Recreational Water																																		**2**		**10**	
Frequency	**Location**	**Date**	**Field ID**	**Lab Report**	**Sample Type**																																
Biannual	SW104	23/11/2022	1302_SW104_221123	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.07	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	1.16	0.94	*0.63*	0.02	0.31
	SW106	23/11/2022	1302_SW106_221123	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.03	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.59	0.47	*0.28*	<0.01	0.19
	SW106	23/11/2022	1302_QC101_221123	ES2242803	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.03	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.64	0.52	*0.32*	<0.01	0.2
	SW106	23/11/2022	1302_QC201_221123	RN1374784	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.018	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.019	<0.01	<0.01	0.015	<0.02	<0.02	<0.02	<0.01	0.422	0.37	*0.2*	<0.01	0.17
	SW108	23/11/2022	1302_SW108_221123	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.71	0.57	*0.36*	0.01	0.21
	SW109	23/11/2022	1302_SW109_221123	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.08	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	1.12	0.91	*0.58*	0.02	0.33
	SW112	23/11/2022	1302_SW112_221123	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.44	0.41	*0.27*	<0.01	0.14
	SW113	23/11/2022	1302_SW113_221123	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.06	0.06	*0.04*	<0.01	0.02
	SW114	23/11/2022	1302_SW114_221123	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
	SW115	23/11/2022	1302_SW115_221123	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
	SW120	23/11/2022	1302_SW120_221123	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.06	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	1.03	0.86	*0.58*	0.02	0.28
	SW124	23/11/2022	1302_SW124_221123	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.06	0.06	*0.05*	<0.01	0.01
	SW125	23/11/2022	1302_SW125_221123	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.17	<0.02	<0.02	0.11	0.05	<0.05	<0.02	<0.02	3.58	**3.02**	*1.95*	0.06	1.07
	SW125	23/11/2022	1302_QC100_221123	ES2242803	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.1	<0.1	<0.02	<0.02	<0.02	0.07	0.03	0.2	<0.02	<0.02	0.12	0.06	<0.05	<0.02	<0.02	4.09	**3.45**	*2.27*	0.06	1.18
	SW125	23/11/2022	1302_QC200_221123	RN1374784	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.064	<0.05	<0.01	<0.01	<0.01	0.037	0.019	0.13	<0.01	<0.01	0.074	0.035	<0.02	<0.02	<0.01	2.516	**2.12**	*1.2*	0.037	0.92
	SW132	24/11/2022	1302_SW132_221124	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.1	0.1	*0.07*	<0.01	0.03
	SW132	24/11/2022	1302_QC100_221124	ES2242803	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.1	0.1	*0.07*	<0.01	0.03
	SW132	24/11/2022	1302_QC200_221124	RN1374784	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	0.075	0.075	*0.049*	<0.01	0.026
	SW133	24/11/2022	1302_SW133_221124	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	0.03	<0.05	<0.02	<0.02	0.14	0.09	*0.04*	<0.01	0.05
	SW143	24/11/2022	1302_SW143_221124	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.05	0.05	*0.03*	<0.01	0.02
	SW156	23/11/2022	1302_SW156_221123	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.05	0.05	*0.05*	<0.01	<0.01
	SW160	25/11/2022	1302_SW160_221125	ES2243233	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.31	0.31	*0.26*	<0.01	0.05
	SW162	25/11/2022	1302_SW162_221125	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.06	0.06	*0.05*	<0.01	0.01
	SW168	23/11/2022	1302_SW168_221123	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.09	0.02	0.17	<0.02	<0.02	0.08	<0.02	<0.05	<0.02	<0.02	2.3	1.82	*1.2*	0.04	0.62
	SW170	24/11/2022	1302_SW170_221124	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.9	0.9	*0.85*	<0.01	0.05
	SW178	25/11/2022	1302_SW178_221125	ES2242803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.09	0.09	*0.09*	<0.01	<0.01
	SW181	25/11/2022	1302_SW181_221125	ES2243233	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.03	0.03	*0.03*	<0.01	<0.01
	SW300	25/11/2022	1302_SW300_221125	ES2243233	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
December Mass-Flux	SW109	22/12/2022	1302_SW109_221222	ES2246451	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.83	0.71	*0.46*	0.01	0.25
	SW109	22/12/2022	1302_QC100_221222	ES2246451	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.93	0.8	*0.53*	0.01	0.27
	SW109	22/12/2022	1302_QC200_221222	RN1377705	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.019	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.027	<0.01	<0.05	<0.01	<0.02	0.021	<0.02	<0.02	<0.02	<0.01	*0.38*	<0.01	0.21
	SW170	22/12/2022	1302_SW170_221222	ES2246451	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.34	0.34	*0.3*	<0.01	0.04
	SW312	22/12/2022	1302_SW312_221222	ES2246451	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.73	0.73	*0.65*	<0.01	0.08
January Mass-Flux	SW109	25/01/2023	1302_SW109_230125	ES2302423	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	1.06	0.91	*0.57*	0.02	0.34
	SW170	25/01/2023	1302_SW170_230125	ES2302423	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.5	0.48	*0.36*	<0.01	0.12
	SW300	25/01/2023	1302_QC100_230125	ES2302423	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.2	0.2	<0.02	<0.02	<0.02	0.04	0.25	0.41	0.03	<0.02	0.18	0.3	<0.05	<0.02	<0.02	3.59	1.72	*0.77*	0.26	0.95
	SW300	25/01/2023	1302_QC200_230125	RN1381361	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.19	0.16	<0.01	<0.01	<0.01	<0.01	0.22	0.36	0.022	<0.01	0.14	0.22	<0.02	<0.02	<0.01	2.152	0.62	*0.62*	0.22	<0.01
	SW300	25/01/2023	1302_SW300_230125	ES2302423	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	0.2	<0.02	<0.02	<0.02	0.04	0.25	0.42	0.02	<0.02	0.18	0.29	<0.05	<0.02	<0.02	3.51	1.64	*0.71*	0.25	0.93
	SW312	25/01/2023	1302_SW312_230125	ES2302423	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	1.98	1.8	*1.58*	0.02	0.22
February Mass-Flux	SW109	23/02/2023	1302_SW109 _230221	ES2305982	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.41	0.36	*0.26*	0.02	0.1
	SW170	21/02/2023	1302_SW170 _230221	ES2305982	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.12	0.12	*0.09*	<0.01	0.03
	SW312	21/02/2023	1302_SW312 _230221	ES2305982	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.06	<0.02	0.22	<0.02	<0.02	0.08	0.06	<0.05	<0.02	<0.02	2.78	**2.23**	*1.71*	0.04	0.52
	SW300	21/02/2023	1302_SW300 _230221	ES2305982	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	0.02	0.05	0.05	<0.02	<0.02	<0.02	0.03	<0.05	<0.02	<0.02	0.36	0.24	*0.15*	0.02	0.09
	SW300	21/02/2023	1302_QC100_230221	ES2305982	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.42	0.37	*0.26*	0.02	0.11
	SW300	21/02/2023	1302_QC200_230221	RN1384540	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.012	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.026	<0.01	<0.01	0.014	<0.02	<0.02	<0.02	<0.01	0.376	0.314	*0.22*	0.01	0.094
Biannual	SW104	27/03/2023	1302_SW104_230327	ES2311000	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.29	<0.02	<0.02	0.15	0.06	<0.05	<0.02	<0.02	4.48	**3.7**	*2.46*	0.05	1.24
	SW106	27/03/2023	1302_SW106_230327	ES2311000	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	1.01	0.86	*0.59*	0.02	0.27
	SW108	27/03/2023	1302_SW108_230327	ES2311000	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.97	0.83	*0.57*	0.02	0.26
	SW112	28/03/2023	1302_QC102_230328	ES2311000	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	0.62	0.55	*0.38*	0.01	0.17
	SW112	28/03/2023	1302_QC202_230328	RN1389154	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.012	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.028	<0.01	<0.01	0.014	<0.02	<0.02	<0.02	<0.01	0.434	0.38	*0.25*	<0.01	0.13
	SW112	28/03/2023	1302_SW112_230328	ES2311000	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	0.59	0.52	*0.36*	0.01	0.16
	SW113	28/03/2023	1302_SW113_230328	ES2311000	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.27	0.27	*0.19*	<0.01	0.08
	SW114	27/03/2023	1302_SW114_230327	ES2311000	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.13	0.05	0.41	<0.02	<0.02	0.21	0.09	<0.05	<0.02	<0.02	6.51	**5.37**	*3.79*	0.09	1.58
	SW115	27/03/2023	1302_SW115_230327	ES2311000	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
	SW120	28/03/2023	1302_SW120_230328	ES2311000	Primary	<0.05	<0.05	0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	0.65	0.53	*0.39*	0.01	0.14
	SW124	28/03/2023	1302_SW124_230328	ES2311000	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.1	0.1	*0.08*	<0.01	0.02
	SW125	28/03/2023	1302_SW125_230328	ES2311000	Primary	<0.05	<0.05	1.04	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.1	0.09	0.47	<0.02	<0.02	0.18	0.3	<0.05	<0.02	<0.02	7.03	**4.6**	*2.98*	0.12	1.62
	SW132	27/03/2023	1302_SW132_230327	ES2311000	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.3	0.3	*0.2*	<0.01	0.1
	SW132	27/03/2023	1302_QC100_230327	ES2311000	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.32	0.32	*0.23*	<0.01	0.09
	SW132	27/03/2023	1302_QC200_230327	RN1389154	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01	0.216	0.22	*0.14*	<0.01	0.076
	SW133	27/03/2023	1302_SW133_230327	ES2311000	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<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	<0.02	<0.02	0.25	0.14	*0.08*	0.01	0.06
	SW143	28/03/2023	1302_SW143_230328	ES2311000	Primary	<0.05	<0.05	0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.03	<0.05	<0.02	<0.02	0.33	0.2	*0.14*	0.02	0.06
	SW152	28/03/2023	1302_SW152_230328	ES2311000	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.29	0.29	*0.23*	<0.01	0.06
	SW156	28/03/2023	1302_SW156_230328	ES2311000	Primary	<0.05	<0.05	<0.05	0.08	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	0.1	<0.02	0.03	<0.02	<0.02	0.04	0.44	0.02	<0.02	0.05	0.24	<0.05	<0.02	<0.02	1.91	0.66	*0.56*	0.04	0.1
	SW160	28/03/2023	1302_SW160_230328	ES2311000	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.1	0.1	*0.09*	<0.01	0.01
	SW162	28/03/2023	1302_SW162_230328	ES2

Appendix C

Sampling Logs

D R A F T

Appendix C Sampling Logs

ANZ

FQM - Groundwater Sampling and Purging Record

AECOM

Q4AN(EV)-405-FM1

Project Name:	Gmp PFAS	Project Number:	60612561	PM Name:	[redacted]	Sample Date:	20.04.23
Client:	Ventia	Project Location:	DWN RAAF BASE	Fieldwork Staff:		Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

NA

NA

Water Quality Parameters

Location ID	Time	Type	QAQC?	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
MW144	8:00am		100 & 200	0.15	31	6.86	130.6	26.5	N,S, Brownish, no sheen
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected			QA/QC Information	Field Commets
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO_3)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.
		x 40 mL Vial (H_2SO_4)	x 100 mL Amber	x 250 mL Plastic		
[redacted]					18-5-23 Date	

ANZ

FQM - Groundwater Sampling and Purging Record

AECOM

Q4AN(EV)-405-FM1

Project Name:	AMP PFAS	Project Number:	60612561	PM Name:	[redacted]
Client:	Ventia	Project Location:	DWN RB	Fieldwork Staff:	

Sample Date: 20/4/23

Well Development or Well Sampling Event? (circle)

General Bore Information

Date of GW Level:	Bore Radius (mm):
Depth to GW (m-pvc):	Screen Interval (m):
Bore Depth (m-pvc):	Casing Radius (mm):
Depth to Product (m-pvc):	Cover Type (gatic/stick up):
Product Thickness (m):	Bore Locked (YES/NO):
	Key Type (if applicable):
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)

Parameter Info.

Chem Kit Serial No.:	
Chem Kit Model:	
Corrected Redox: Y / N	
(The correction to apply is probe dependent)	
Parameter method: ☐ Downhole ☐ Retrieved	

Decontamination

- ☐ Decontaminated
- ☐ Dedicated
- ☐ Disposable
- ☐ Other (specify)

Sampling Method

- ☐ Low Flow Pump rate:
- Intake depth:
- ☐ Bailer ☐ Hydrasleeve
- ☐ Peristaltic Pump ☐ Waterra
- ☐ Other (specify)

Hydrasleeve Info.

Hydrasleeve Size:	Monitoring sequence followed (number in order):
Hydrasleeve Type:	Gauging
Sampling Depth (m-pvc):	Hydrasleeve in
Hydrasleeve Install time:	Hydrasleeve out
Sampling Start Time:	Parameters

purge volumes removed:

Total purged volume (L):

Water Quality Parameters

Location ID	Time	Type	QAQC?	DTW (mbTOC)	Well Depth (mbTOC)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
MW140	20-04-23			7.00	14.80				NS, clear/slt, cloudy bottom
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:

Field Filtered:	Unfiltered:

Bottles Collected

x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO_3)
x 40 mL Vial (H_2SO_4)	x 100 mL Amber	x 250 mL Plastic

QA/QC Information

[redacted]

18-5-23
Date

Field Comments

Bore volume calculation, bore condition, fate of tubing, redox correction etc.

ANZ

FQM - NAPL and Groundwater Level Gauging Record

Pg. 1

AECOM

Q4AN(EV)-414-FM1

Project Name:	PFAS Comp	**Project Location:**	EARE DARWIN
Project Number:	60612461	**Client:**	Qantas
		PM Name:	[redacted]
		Fieldwork Staff Name:	

Confirm NAPL and groundwater levels by repeat measurements. All columns must be completed. If NAPL is not present in a well write 'ND' (Not Detected) in the relevant column.

Well ID	Date (dd/mm/yy)	Time (24hr:mm)	PID Reading (ppm)	Depth to LNAPL (mBTOC)	Depth to Groundwater (mBTOC)	LNAPL Thickness (m)	Depth to DNAPL (mBTOC)	Total Well Depth (mBTOC)	DNAPL Thickness (m)	Comments (well condition, odour, NAPL colour and viscosity)
		Field Data								
MW241	15/05/23	9:42			1.82			14.45		GOOD Cond.
MW240		10:14			2.22			14.42		GOOD C - No cap
MW253		9:57	—		1.72			15.09		Good condition
MW192		10:25			3.74			7.65		GC - Small tree over it.
MW156		10:42			1.51			11.90		GC
MW112		10:55			2.58			13.55		GC —
MW205		11:13			2.60			14.88		GC
MW115		11:29			3.75			14.23		GC
	16.05.23									
MW454		7:10								
MW422	MW235	7:50			1.78					
MW139	↑	7:50			1.80			17.01		GC, NS
MW141	Sampled	8:30			2.35			15.90		GC NS
MW303		8:50			4.34			15.43		GC NS
MW144		9:20			6.33			14.23		GC NS
MW211		10:10			6.90			15.46		GC NS
MW200		10:30			3.43			14.70		GC NS
MW150		10:52			4.34			14.94		GC, NS
MW176		11:15			3.85			11.63		GC, NS
MW209		11:35			3.16			14.82		GC NS
					1.16			11.67		GC, NS
								11.50		

construction site

Contacted

Measurement Equipment

Make & Model:		**Supplier:**	
Serial No.:		**Calibration Report Provided?**	

Notes/Comments

(PID) - photo ionisation detector; (ppm) - parts per million; (LNAPL) - light non-aqueous phase liquids; (DNAPL) - dense light non-aqueous phase liquid; (mBTOC) - metres below top of casing

Approval and Distribution

[redacted]

15/05/23
Date

[redacted]

18-5-23
Date

Distribution: Project Central File

FQM - NAPL and Groundwater Level Gauging Record

AECOM

Q4AN(EV)-414-FM1

Project Name:	AFAS GMP	Project Location:	RAAF DARWIN	PM Name:	[redacted]
Project Number:	60612561	Client:	Ventia	Fieldwork Staff Name:	

Confirm NAPL and groundwater levels by repeat measurements. All columns must be completed. If NAPL is not present in a well write 'ND' (Not Detected) in the relevant col

Field Data

Well ID	Date (dd/mm/yy)	Time (24hr:mm)	PID Reading (ppm)	Depth to LNAPL (mBTOC)	Depth to Groundwater (mBTOC)	LNAPL Thickness (m)	Depth to DNAPL (mBTOC)	Total Well Depth (mBTOC)	DNAPL Thickness (m)	Comments (well condition, odour, NAPL colour and viscosity)
MW210	16.03.23	12:20			2.10			11.75		GC NS
	17.03.23									
MW18S		7:40			1.57			10.35		GC NS
MW191		8:15			2.77			12.69		GC NS
MW190		8:26			1.49			12.39		GC NS
MW195		8:40			1.59			11.16		GC NS
MW194		9:10			1.37			12.40		GC NS
MW12B		10:03			1.9			12.27		GC NS
MW102		10:30			2.94			12.40		GC NS
MW107		11:20			2.91			14.54		GC NS
MW215		11:45			5.91			15.22		
MW451		12:20			3.18			15.60		
MW148		12:35			2.51			11.40		
MW452		13:30			2.60			13.57		

Measurement Equipment

Make & Model:		Supplier:	
Serial No.:		Calibration Report Provided?	

Notes/Comments

(PID) - photo ionisation detector; (ppm) - parts per million; (LNAPL) - light non-aqueous phase liquids; (DNAPL) - dense light non-aqueous phase liquid; (mBTOC) - metres below top of casing

Approval and Distribution

[redacted] 15/05/23 Date

Pr [redacted] 18-5-23 Date

Distribution: Project Central File

ANZ

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

PG 3

Project Name:	Dump PFAS MW	Project Number:	60612561	PM Name:	[redacted]
Client:	Ventia	Project Location:	DWN RAAF	Fieldwork Staff:	

Bore ID:

Sample Date: 23.03.23

Well Development or Well Sampling Event? (circle)

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				Parameters

Calculated bore volume (L): | Includes/ excludes bore annulus (circle) | # purge volumes removed: | Total purged volume (L):

Water Quality Parameters

DATE	Quantity of Fluid Removed (L)	DTW (mbTOC)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, ~~Turbidity~~ clarity
23.03.23	MW107	11.35		1.09	60.1	5.29	57.4	30.4	NS orange@bottom cloudy
	MW103	11.45		1.00	86.1	4.95	75.7	30.9	NS, orange sed @ bottom, cloudy
	MW128	11.55		0.78	74.2	4.41	103.5	31.1	NS, cloudy clear
	MW431	12.05		0.90	93.6	5.38	108.2	31.2	NS " "
	MW148	12.15		0.73	76.7	6.72	106.3	31.6	NS Bowing@bottom cloudy
	MW432	12.25		0.98	102.3	5.61	93.2	31.2	"
14.03.23	MW247	10:50		4.01	34.8	4.52	49.3	30.6	NS Clearish cloudy
15.03.23	MW133	7.60		1.92	45.6	4.80	55.1	33.7	NS, clearish, floaties, cloudy
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected			QA/QC Information	Field Comments
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO_3)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.
		x 40 mL Vial (H_2SO_4)	x 100 mL Amber	x 250 mL Plastic		

Approval and Distribut[redacted]

[redacted]

15/05/23
Date

18-5-23
Date

[redacted]

18-5-23
Date

18-5-23
Date

Distribution: Project Central File

ANZ

FQM - Groundwater Sampling and Purging Record

Pg 1

ECOM

Q4AN(EV)-405-FM1

Project Name:	SMP MW	Project Number:	60612561 SMN	PM Name:	[redacted]	Bore ID:	14-3-23 2
Client:	Defence	Project Location:		Fieldwork Staff:		Sample Date:	

Well Development or Well Sampling Event? (circle)

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

~~Date~~ Time Well	Cumulative Vol. Removed (L)	SWL (m-pvc)	TURBIDITY Pump Rate NTUs	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity, clarity
14.03.23	MW115		37.9	4.17	89.9	4.61	-75.0	30.0	QC5 100 & 200 no smell
	MW205		55.4	4.21	30.7	4.59	-22.1	30.3	cloudy, clearish, no smell
	MW12		8.3	3.61	31.3	4.29	65.7	30.7	cloudy but clear, no smell
	MW156		36.1	2.44	33.1	4.45	15.2	29.1	QC300 QC400 cloudy, no smell clear.
20.3.23									
	MW190	7.00	26.6	4.01	52.7	4.48	76.2	31.9	(QC100 QC200) cloudy NS clearish.
	MW21	7.45	2.5	1.07	263.7	5.09	63.2	30.2	NS, cloudy clearish
	MW200	8.20	73.5	1.71	40.2	4.70	56.3	29.4	NS, cloudy, clearish browning@bottom
	MW76	8.44	112.5	1.96	69.9	5.67	59.8	29.3	(QC101, QC201) orangy brown, NS
	MW209	9.15	160.7	1.28	1567	4.68	64.1	29.5	cloudy NS Bottom 150mm orangey brown sludge (photo)
	MW210	9.27		2.31	140.7	5.87	37.0	30.9	NS cloudy, Browny @ bottom
	MW185	10.25		0.88	544	5.06	39.4	30.3	NS cloudy clearish
	MW191	10.41		2.10	56.9	4.81	62.5	31.4	NS, cloudy clearish
	Acceptable Parameter Range:			± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected			QA/QC Information	Field Comments
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO_3)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.
		x 40 mL Vial (H_2SO_4)	x 100 mL Amber	x 250 mL Plastic		

[redacted]

18-5-23
Date

ANZ

FQM - Groundwater Sampling and Purging Record

pg.1

						Bore ID:	
Project Name:	Timp Hills SW	Project Number:	60612561	PM Name:	[redacted]	Sample Date:	27.03.23
Client:	Ventia	Project Location:	DWN RAAF	Fieldwork Staff:		Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.		Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:		☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:		☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y N		☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)		☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole			☐ Other (specify)	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved					Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):			

Water Quality Parameters

Time	Cumulative Vol. Removed (L)	SW (mAHD)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity clarity
7.30	27.5	SW132		3.42	52.3	6.18	33.1	28.2	NS, Low flow, cloudy, (QA/QC 200)
8.20		SW133		3.55	52.4	6.83	48.1	29.6	NS, FLOW (clearish)
10.45		SW114		3.60	52.2	5.56	84.7	31.4	NS, NO FLOW, clearish, Fish & organic
11.25		SW104		2.30	49.9	5.37	67.2	31.6	NS, NO flow, clear with bits in it
11.43		~~SW~~ SW115		3.34	37.9	6.23	67.4	30.3	NS, NO flow, clear, Fish
12.15		SW106		3.95	46.2	6.26	53.3	30.4	NS, High Flow, clear, people swimming
12.50		SW108		4.08	47.6	5.69	74.8	29.9	NS, FLOW, clearish, Debris
13.10		~~SW~~ SW168		3.53	49.5	5.15	86.2	33.9	NS, NO FLOW, clear
13.20		SW109		3.91	49.4	5.67	87.6	30.1	NS, High FLOW, clear
13.40		SW300		3.38	53.9	5.63	78.0	32.4	NS, Low FLOW, clearish, puddles
7.30	28.03.23	SW152		3.91	51.3	5.73	78.1	27.2	NS, High FLOW murky
7.40		SW170		3.93	24.0	6.21	3[illegible]	24.9	NS, FLOW, Brownish Orangey-murky
8.10		SW312		4.79	22.9	6.43	99.0	26.3	NS, FLOW, murky
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected			QA/QC Information	Field Comments
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO_3)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.
		x 40 mL Vial (H_2SO_4)	x 100 mL Amber	x 250 mL Plastic		

Approval and Distributio[illegible]

[redacted]

[redacted]

3/05/23
Date

[illegible]nature

18-5-23
Date

18-5-23
Date

Distribution: Project Central File

360 Tot depths.

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ANZ

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:	Mass Flux Venting.	**Project Number:**	60612561	**PM Name:**	JG	**Bore ID:**	
Client:		**Project Location:**	BWN	**Fieldwork Staff:**	SE	**Sample Date:**	22.12.22
						Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.:	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model:	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	**Corrected Redox:** Y / N	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	**Parameter method:** ☐ Downhole		☐ Other (specify)	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☐ Retrieved				Parameters

Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:	Total purged volume (L):

Water Quality Parameters

Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
7:00	SW12			6.81	382	8.01	1043	26.3	No Flow
7.36	SW170			5.30	37.8	6.37	1633	26.0	No Flow
8.30	SW10%			4.83.	27.8	5.80	167.8	26.5	QC's 100-200 High Flow
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected						QA/QC Information	Field Comments
Field Filtered:	**Unfiltered:**		x 40 mL Vial (HCl)		x 60 mL Ferrous		x 60 mL metals (HNO_3)		Bore volume calculation, bore condition, fate of tubing, redox correction etc.
			x 40 mL Vial (H_2SO_4)		x 100 mL Amber		x 250 mL Plastic		

Approval and Distribution

Fieldwork Staff Signature	23.12.22 Date	Checker Name and Signature	21-1-23 Date
Project Manager Signature	12-1-23 Date	**Distribution:** Project Central File	

AECOM

Project PFASOMP Darwin PFAS Mass-Flux

File/Ref No. 60612561/4.1 Page

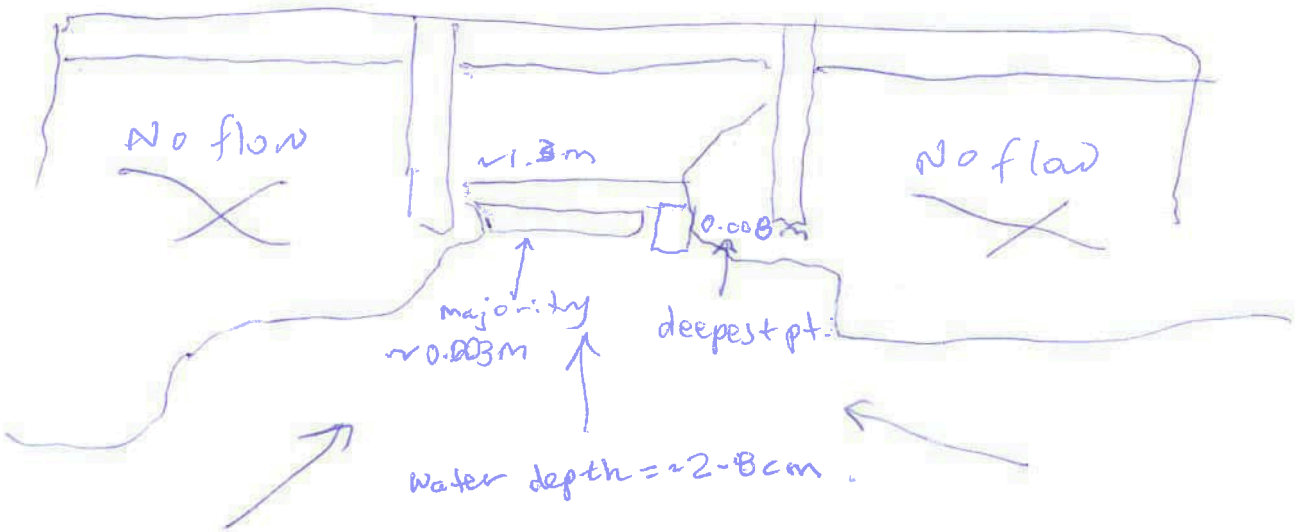
By P.H Date 25.01.23

SW300

27.7°C

Flow = ~0.2 m/s? max.

~5m/sec in leaf.



Parameters

Temp	D.O	EC	pH	Redox
27.7	4.04	157.9	5.01	170.8

Comments

- Took QC100/200 here
- Algae & tadpoles
- Rapids from rock walls coming into culvert & only one culvert flowing through.
- Sandy islands throughout & no consistent flow.

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Project PFASOMP DARWIN PFAS Mass-Flux

File/Ref No. 60612561

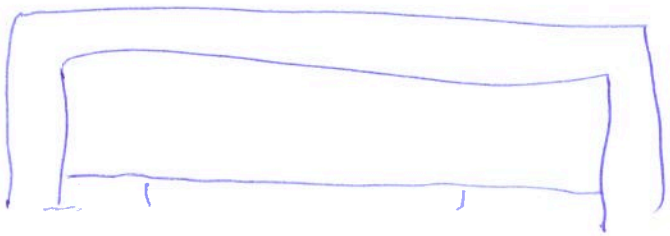
By P.H - AECOM

Page

Date 25-01-23

SW312

No flow



deepest in ~ 1-2 mm

Parameters

Temp	DO	EC	pH	Redox
28.8	4.55	82.7	7.18	148.6.

Notes

- Pooled water, collected sample
- Only 1-2 mm deep.
- Flows into large culvert drain further South which was low flow w algae

AECOM

Project

File/Ref No.

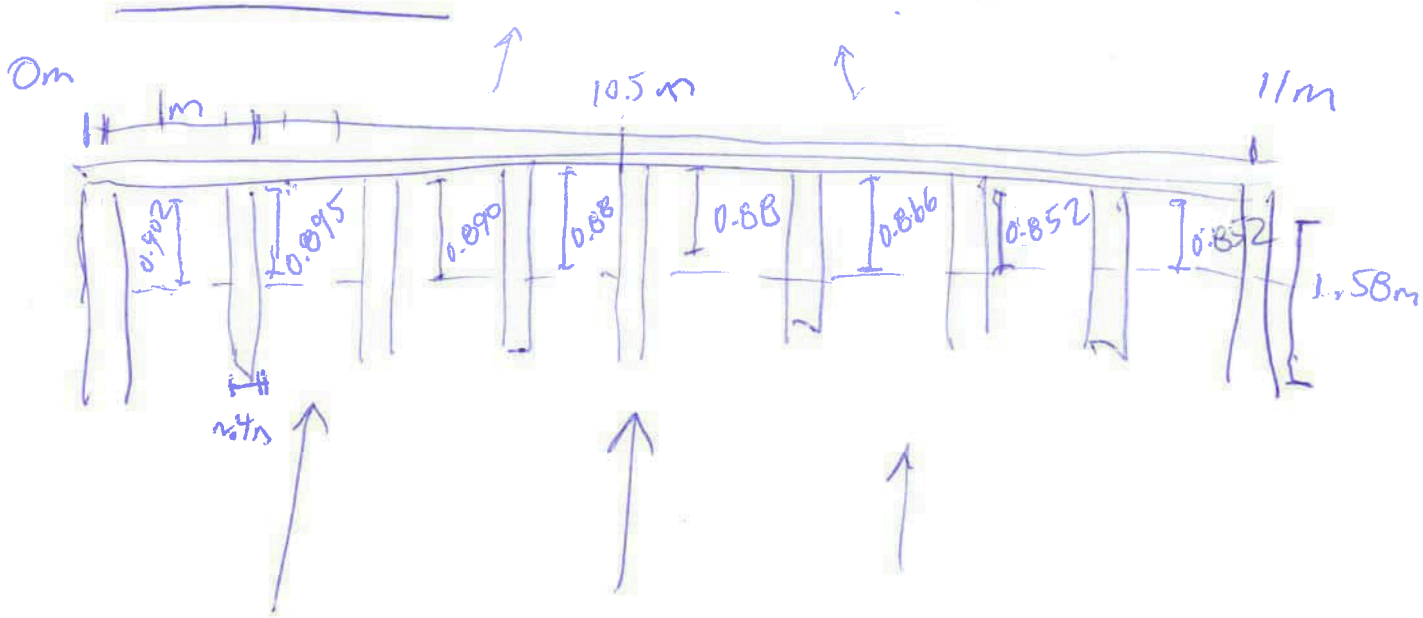
By

Page

Date

SW170

Flow reader ~0.0 m/s?



Parameters

Temp	Do	EC	pH	Redox
29.8	3.50	95-7	5.72	161.4.

Comments

- Mod/low flow, pale brown, mod turb, slight natural sheen
- 8 x culverts.
- Windy

ANZ

FQM - Groundwater Sampling and Purging Record

Q4AN(EV)-405-FM1

Project Name:	PERSOM P	Project Number:	60612561	PM Name:	J C	Bore ID:	
Client:	DoD	Project Location:	RAAF Darwin	Fieldwork Staff:	P. H	Sample Date:	25.01.23
						Well Development or Well Sampling Event? (circle)	

General Bore Information		Parameter Info.	Decontamination	Sampling Method	Hydrasleeve Info.	
Date of GW Level:	Bore Radius (mm):	Chem Kit Serial No.: B.	☐ Decontaminated	☐ Low Flow Pump rate:	Hydrasleeve Size:	Monitoring sequence followed (number in order):
Depth to GW (m-pvc):	Screen Interval (m):	Chem Kit Model: YSI	☐ Dedicated	Intake depth:	Hydrasleeve Type:	
Bore Depth (m-pvc):	Casing Radius (mm):	Corrected Redox: Y / (N)	☐ Disposable	☐ Bailer ☐ Hydrasleeve	Sampling Depth (m-pvc):	Gauging
Depth to Product (m-pvc):	Cover Type (gatic/stick up):	(The correction to apply is probe dependent)	☐ Other (specify)	☐ Peristaltic Pump ☐ Waterra	Hydrasleeve Install time:	Hydrasleeve in
Product Thickness (m):	Bore Locked (YES/NO):	Parameter method: ☐ Downhole		☑ Other (specify) GRAB	Sampling Start Time:	Hydrasleeve out
	Key Type (if applicable):	☑ Retrieved				Parameters
Calculated bore volume (L):	Includes/ excludes bore annulus (circle)	# purge volumes removed:		Total purged volume (L):		

Water Quality Parameters

Time	Cumulative Vol. Removed (L)	SWL (m-pvc)	Flow Location Pump Rate	DO (ppm or mg/L)	E.C. (mS/cm or µS/cm)	pH	Redox (mV)	Temp °C	Odour, Colour, Turbidity
12:30	—	—	SW300	4.04	157.9	5.01	170.8	27.7	Colourless algae, low flow, tadpoles
13:15	—	—	SW109	3.89	156.2	5.44	156.3	28.3	Colourless, algae, mod-high flow.
13:50	—	—	SW312	4.55	82.7	7.18	148.6	28.8	No flow, collected from pooled water.
14:18	—	—	SW170	3.50	95.3	5.72	161.3	29.8	Pale brown, low flow, algae.
Acceptable Parameter Range:				± 10%	± 3%	± 0.05	± 10 mV	± 0.2 °C	± 10% turbidity (if using a turbidity meter)

Analytes Sampled for:		Bottles Collected			QA/QC Information	Field Commets
Field Filtered:	Unfiltered:	x 40 mL Vial (HCl)	x 60 mL Ferrous	x 60 mL metals (HNO_3)	SW300	Bore volume calculation, bore condition, fate of tubing, redox correction etc.
0	2	x 40 mL Vial (H_2SO_4)	x 100 mL Amber	x 250 mL Plastic		* Get flow readings for SW109 from BOM website.
		2 APFM3				

Approval and Distribution

Fieldwork Staff Signature	Date	Checker Name and Signature	Date
	25.01.23		

Project Manager Signature — Date

Distribution: Project Central File

AECOM

Project

File/Ref No.

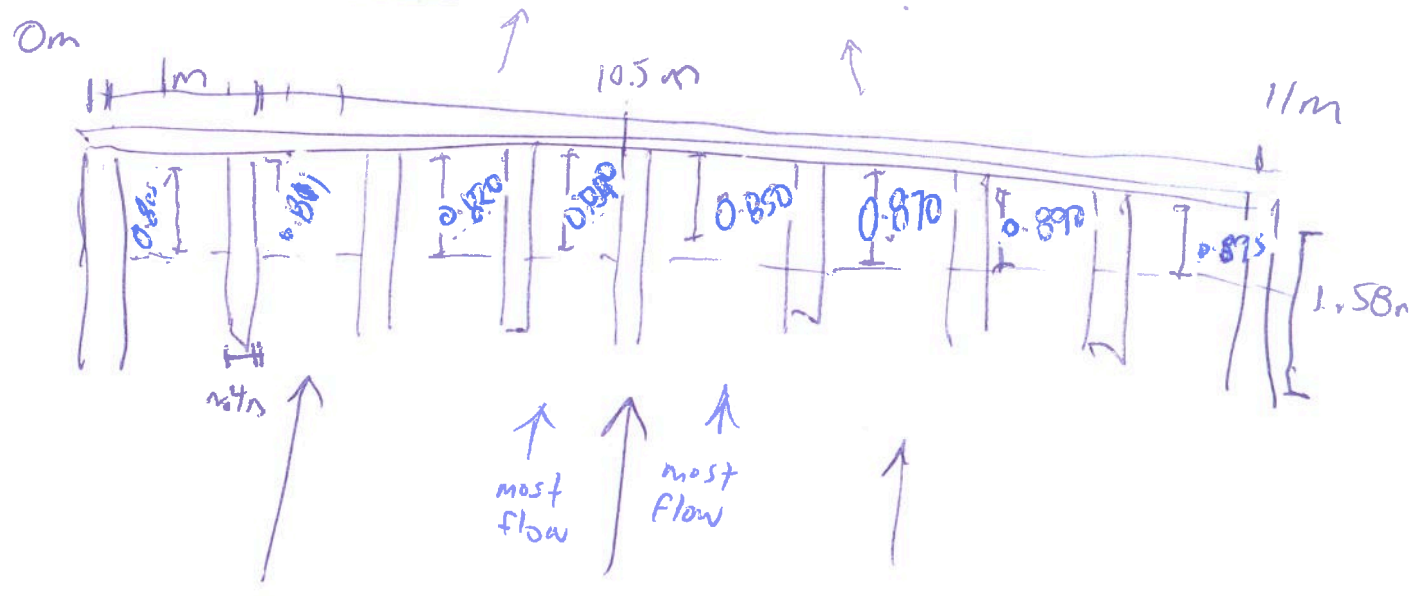
By SF

Page

Date 4.04.23.

SW170

Flow reader, 0-1 m/s?



Parameters

Temp	Do	Ec	pH	Redox
27.8	0.48	49.9	6.80	85.9

Comments

- Mod/low flow, pale brown, mod turb, slight
- 8 x culverts.
- QC's 100 & 200

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Project PFASOMP Darwin PFAS Mass Flux

File/Ref No. 60612561/4.1

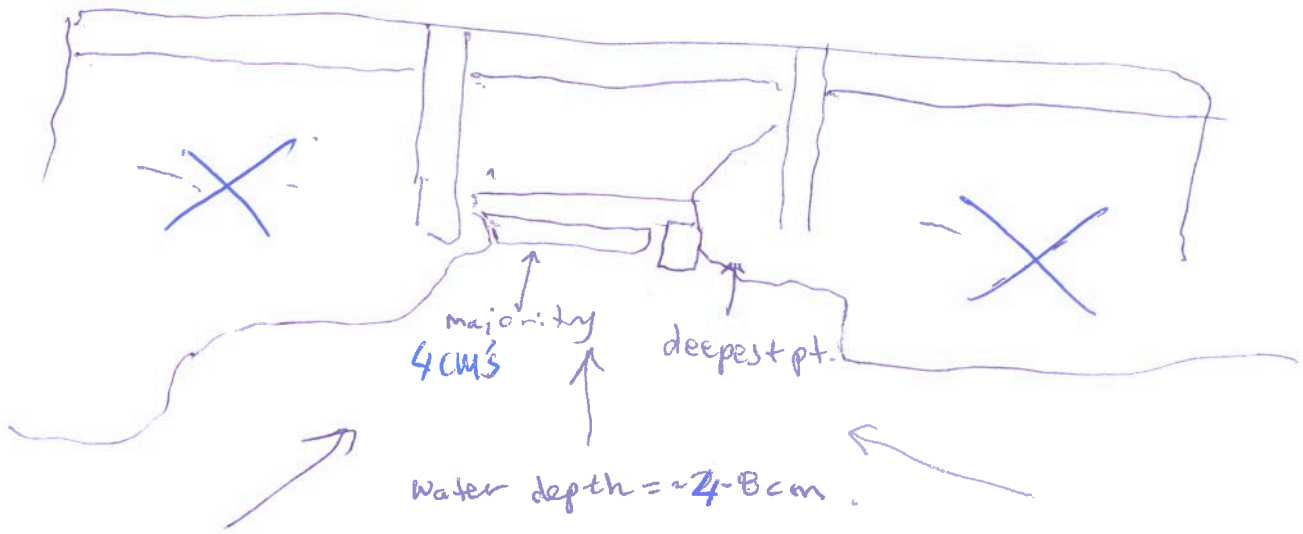
By SF

Page

Date 14 Oct 23

SW300

Flow = Low flow.



Parameters

Temp	D.O	EC	pH	Redox
30.4	5.12	57.4	5.64	82.9

Comments

- w only one culvert flowing through.
- Sandy islands throughout w no consistent flow.
- Clear water, water bugs.

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Project PFASOMP DARWIN PFAS Mass-Flux

File/Ref No. 60612561

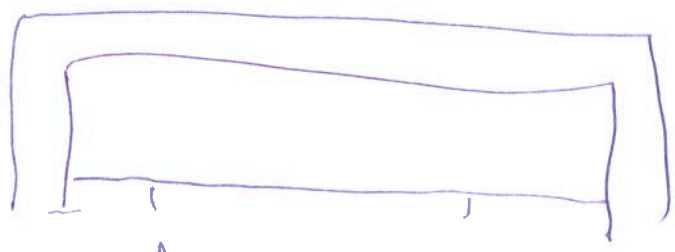
By SF -AECOM

Page

Date 14.04.23

SW312

Low flow



deepest in ~ 2cm's deep.

Parameters

Temp	DO	EC	pH	Redox
27.8	6.61	29.0	6.89	48.3

Notes

Low flow, clear

- Only 2cm deep.
- Flows into large culvert drain further South which was low flow & algae

SW109

- fast flow
- clear

No smell

Parameters

Temp	DO	EC	pH	Redox
28.4	9.72	45.3	5.69	83.2

Appendix D

Data Validation Reports

Appendix D Data Validation Reports

DATA VALIDATION REPORT; WATER and BIOTA

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:**	05/05/2023
Site:	1302 – RAAF Base Darwin		
Matrix:	Water and Biota	**Data Verified by:**	[redacted]
Laboratory:	ALS; NMI	**Date:**	09/05/2023

Lab reference:

October 2022 Biota:
ES2240147
November 2022 SW:
ES2242803, ES2243233, RN1374784,
December 2022 SW:
ES2246451, RN1377705

January 2023 SW:
ES2302423, RN1381361
February 2023 SW:
ES2305982, RN1384540
March/April 2023 GW & SW:
ES2311000, ES2310999, ES2312996, RN1389154, RN1389152
April 2023 SW:
ES2312445, RN1390587

Key Findings:

The analytical data can be used as a basis for interpretation subject to the limitations outlined below:

- Elevated RPDs should be taken into consideration when using data for sum of PFOS, PFHxS PFOA and Sum of PFHxS and PFOS quantitatively and when interpreting data close to guidelines from primary batches ES224803, ES2302423, ES2310999 and ES2311000.
- The potential exists for concentrations of PFOS to be below the LOR, but above the guideline in samples 1302_SW114_221123, 1302_SW115_221123, 1302_SW300_221125, 1302_SW115_230327 and 1302_MW209_230320 and should be taken into consideration when interpreting results.

Component		Outliers			Material impact on interpretation
		No	Yes	Comment	
Frequency of field quality assurance/quality control (QAQC)		✓			
Number of tests requested/reported		✓			No
Sample handling/preservation/holding times			✓	1	No
Frequency of laboratory QA/QC			✓	2	No
Limits of reporting (LOR)			✓	3	No
Blank analysis	Field blank		✓	4	
	Rinsate blank		✓	5	No
	Trip blank	✓			No
	Method blank	✓			
Field intra-laboratory relative percent differences (RPDs)			✓	6	No
Field inter-laboratory RPDs			✓	7	No
Laboratory duplicate RPDs		✓			
Matrix spike (MS) % recoveries		✓			
Laboratory control spike (LCS) % recoveries			✓	8	No
Surrogate % recoveries		✓			
Other observations		✓			

DATA VALIDATION REPORT; WATER and BIOTA

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:**	05/05/2023
Site:	1302 – RAAF Base Darwin		
Matrix:	Water and Biota	**Data Verified by:**	[redacted]
Laboratory:	ALS; NMI	**Date:**	09/05/2023

Comments

1. Sample handling

Handling/Preservation:
Primary samples were received at ALS laboratory preserved and chilled within the acceptable range (<6ºC), with the below exceptions:

Event	Batch Number	Temperature
November 2022	ES2242803	7.5 °C
	ES2243233	13.8 °C
December 2022	ES2246451	10.1 °C
February 2023	ES2305982	6.3 °C
	ES2302423	13.9 °C
March 2023	ES2311000	18.4 °C
	ES2310999	18.6 °C
April 2023	ES2312445	25.8 °C
	ES2312996	15.4 °C

The sample receipt temperatures were not recorded for the NMI inter-laboratory duplicate samples; however, the samples were noted to be “chilled”.

Potential degradation of analytes and under reporting must be taken into consideration. However, as the receipt temperatures were below the ambient water temperature at the time of sampling (~25 – 30ºC) and the samples were immediately cooled upon collection, this is not considered to significantly impact the interpretation of results.

2. Frequency of laboratory QAQC

Laboratory duplicate samples were not reported for PFAS analytes in laboratory batches ES2240280, ES2243233, ES2242803, ES2305982, ES2310999, ES2311000 and ES2312445. The precision of the data can be assessed as acceptable based on intra- and inter-laboratory duplicate RPDs which were reported at the required frequencies and generally within control limits.

Water matrix spikes were not reported at the required frequencies for PFAS analytes in batches ES2240280, ES2243233, ES2242803, ES2305982, ES2310999, ES2311000 and ES2312445. The accuracy of the data can be assessed as acceptable based on method blanks, LCS and surrogate spike recoveries (which were reported at the required frequencies and within control limits for these lab batches).

3. Limits of reporting

Limits of reporting were sufficiently low to enable assessment against adopted guideline criteria, with the exception of PFOS in all primary batches.
The potential exists for concentrations of PFOS to be below the LOR, but above the 99% freshwater ecosystem species guideline in samples 1302_SW114_221123, 1302_SW115_221123, 1302_SW300_221125, 1302_SW115_230327 and 1302_MW209_230320 and should be taken into consideration when interpreting results.

DATA VALIDATION REPORT; WATER and BIOTA

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:**	05/05/2023
Site:	1302 – RAAF Base Darwin		
Matrix:	Water and Biota	**Data Verified by:**	[redacted]
Laboratory:	ALS; NMI	**Date:**	09/05/2023

4. Field Blank	As per project specifications, field blanks were collected at a rate of one per sampling date for all sampling days with the exception of the following: - 23 November 2022 - 15 March 2023 - 22 March 2023 - 14 April 2023 As concentrations were reported below the LOR in the available field blanks and rinsate blank samples, as well as the nature of PFAS not being volatile, cross contamination via volatilisation during sampling is assessed to not have occurred.
5. Rinsate Blank	As per project specifications, rinsate blanks were collected at a rate of one per sampling date for all sampling days with the exception of the following: - 23 November 2022 - 15 March 2023 - 22 March 2023 - 14 April 2023 - 20 April 2023 The decontamination methods are assessed as acceptable and the potential for cross contamination via sampling methods is considered unlikely based on the following: • All sampling equipment was either dedicated, disposable or decontaminated with a solution of water and Liquinox between sampling locations. • Dedicated water containers and clean disposable gloves were used to collect each sample. • The decontamination methods and field staff were consistent over the course of the sampling events • Concentrations of all analytes were reported below the LOR in the rinsate samples analysed.
6. Field intra-laboratory duplicate RPDs	Field intra-laboratory duplicate RPDs were reported within control limits, with the exception of the following analytes (high concentration in bold) from the February 2023 surface water samples (ES2305982): - 1302_SW300_230221 & **1302_QC100_230221** for Sum of PFAS (43%) - 1302_SW300_230221 & **1302_QC100_230221** for Sum of PFHxS and PFOS (54%) As all concentrations of PFAS were reported well above the adopted guidelines from the February 2023 surface water samples (ES2305982), the elevated RPDs are not considered to affect the interpretation of results against guidelines. However, the elevated RPDs should be taken into consideration when using the data quantitatively.

DATA VALIDATION REPORT; WATER and BIOTA

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:**	05/05/2023
Site:	1302 – RAAF Base Darwin		
Matrix:	Water and Biota	**Data Verified by:**	[redacted]
Laboratory:	ALS; NMI	**Date:**	09/05/2023

7. Field inter-laboratory duplicate RPDs	Field inter-laboratory duplicate RPDs were reported within control limits, with the exception of the following analytes (higher concentration in bold): • ES2242803 (November 2022 surface water): - **1302_SW106_221123** & 1302_QC201_221123 for Sum of PFAS (32%) - **1302_SW106_221123** & 1302_QC201_221123 for PFOS (33%) - **1302_SW125_221123** & 1302_QC200_221123 for Sum of PFAS (34%) - **1302_SW125_221123** & 1302_QC200_221123 for Sum of PFHxS and PFOS (35%) - **1302_SW125_221123** & 1302_QC200_221123 for PFOS (48%) • ES2302423 (January 2023 surface water): - **1302_SW300_230125** & 1302_QC200_230125 for Sum of PFAS (47%) - **1302_SW300_230125** & 1302_QC200_230125 for PFHxS and PFOS (88%) - **1302_SW300_230125** & 1302_QC200_230125 for PFHxS (196%) • ES2310999 (March 2023 groundwater): - **1302_MW115_230314** & 1302_QC200_230314 for PFHpS (34%) - **1302_MW115_230314** & 1302_QC200_230314 for PFHxA (32%) - **1302_MW115_230314** & 1302_QC200_230314 for PFPeS (41%) - **1302_MW115_230314** & 1302_QC200_230314 for Sum of PFAS (31%) - **1302_MW115_230314** & 1302_QC200_230314 for Sum of PFHxS and PFOS (36%) - **1302_MW115_230314** & 1302_QC200_230314 for PFOS (45%) - **1302_MW454_230322** & 1302_QC202_230322 for PFHpS (84%) - **1302_MW454_230322** & 1302_QC202_230322 for PFPeS (50%) - **1302_MW454_230322** & 1302_QC202_230322 for PFPeA (33%) - **1302_MW454_230322** & 1302_QC202_230322 for Sum of PFAS (55%) - **1302_MW454_230322** & 1302_QC202_230322 for Sum of PFHxS and PFOS (67%) - **1302_MW454_230322** & 1302_QC202_230322 for PFOS (67%) - **1302_MW454_230322** & 1302_QC202_230322 for PFOA (45%) - **1302_MW454_230322** & 1302_QC202_230322 for PFHxS (42%)

DATA VALIDATION REPORT; WATER and BIOTA

Project Manager:	[redacted]	**Validation by:**	[redacted]
Project number:	60612561	**Date:**	05/05/2023
Site:	1302 – RAAF Base Darwin		
Matrix:	Water and Biota	**Data Verified by:**	[redacted]
Laboratory:	ALS; NMI	**Date:**	09/05/2023

5. Field inter-laboratory duplicate RPDs (cont.)

- ES2311000 (March 2023 surface water):
  - **1302_SW112_230328** & 1302_QC202_230328 for Sum of PFAS (30%)
  - **1302_SW112_230328** & 1302_QC202_230328 for Sum of PFHxS and PFOS (31%)
  - **1302_SW112_230328** & 1302_QC202_230328 for PFOS (36%)
  - **1302_SW170_230414** & 1302_QC200_230414 for Sum of PFHxS and PFOS (55%)
  - **1302_SW170_230414** & 1302_QC200_230414 for Sum of PFAS (55%)
  - **1302_SW170_230414** & 1302_QC200_230414 for PFOA (54%).

As there are no adopted guideline values for Sum of PFAS, PFHpS, PFHxA, PFPeS or PFPeA the elevated RPDs are not expected to affect interpretation of results against guidelines. However, this apparent lack of precision should be taken into consideration when interpreting concentrations of samples from primary lab batches ES224803 (November 2022 surface water), ES2302423 (January 2023 surface water), ES2310999 (March 2023 groundwater) and ES2311000 (March 2023 surface water) for PFOS, PFHxS, PFOA and Sum of PFHxS+PFOS close to guidelines.

6. Laboratory Control Spike (LCS) % recoveries

The following LCS recoveries were outside control limits and may affect data interpretation for October 2022 biota batch ES2240147:

Analyte	Recovery (%)	Limits (%)	Comment
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	86%	93.4-130%	Recovery less than lower control limit
10:2 Fluorotelomer sulfonic acid (10:2)	90.4%	93.4-130%	Recovery less than lower control limit

The LCS recovery for 10:2 FTS was less than the lower control limit, therefore the potential exists for the concentrations of 10:2 FTS to be under reported by up to 7.4%. As there is no adopted guideline value for 10:2 FTS, the potential for under reporting is not expected to affect interpretation of the results against guidelines. However, this potential for under reporting should be taken into consideration when using the data quantitatively.

Data Validation Report
QAQC Blanks
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Base Darwin

QAQC Blanks

AECOM

Lab Report	ES2240280	ES2242803	ES2243233	ES2246451	ES2302423	ES2305982	ES2310999	ES2310999
Field ID	1302_QC304_221031	1302_QC300_221124	1302_QC300_221125	1302_QC300_221222	1302_QC300_230125	1302_QC300 _230221	1302_QC300_230320	1302_QC302_230323
Date	31/10/2022	24/11/2022	25/11/2022	22/12/2022	25/01/2023	21/02/2023	20/03/2023	23/03/2023
Sample Type	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate

Analyte	Units	LOR								
PFAS Full Suite										
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Data Validation Report
QAQC Blanks
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QAQC Blanks

AECOM

Lab Report	ES2310999	ES2311000	ES2311000	ES2242803	ES2243233	ES2246451	ES2302423	ES2305982
Field ID	1302_QC303_230314	1302_QC300_230327	1302_QC301_230328	1302_QC400_221124	1302_QC400_221125	1302_QC400_221222	1302_QC400_230125	1302_QC400 _230221
Date	14/03/2023	27/03/2023	28/03/2023	24/11/2022	25/11/2022	22/12/2022	25/01/2023	21/02/2023
Sample Type	Rinsate	Rinsate	Rinsate	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank

Analyte	Units	LOR								
PFAS Full Suite										
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Data Validation Report
QAQC Blanks
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Base Darwin

QAQC Blanks

AECOM

Lab Report	ES2310999	ES2310999	ES2310999	ES2310999	ES2311000	ES2311000	ES2240280	ES2302423
Field ID	1302_QC400_230320	1302_QC401_230322	1302_QC402_230323	1302_QC403_230314	1302_QC400_230328	1302_QC401_230328	1302_QC504_221024	1302_QC500_230125
Date	20/03/2023	22/03/2023	23/03/2023	14/03/2023	27/03/2023	28/03/2023	24/10/2022	25/01/2023
Sample Type	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank	Field Blank	Trip Blank	Trip Blank

Analyte	Units	LOR								
PFAS Full Suite										
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Data Validation Report
QAQC Blanks
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Base Darwin

QAQC Blanks

Lab Report	ES2305982	ES2310999	ES2310999	ES2311000	ES2312996
Field ID	1302_QC500 _230221	1302_QC301_230322	1302_QC500_230323	1302_QC500_230328	1302_QC500_230420
Date	21/02/2023	22/03/2023	23/03/2023	28/03/2023	20/04/2023
Sample Type	Trip Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank

Analyte	Units	LOR					
PFAS Full Suite							
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorobutanoic acid (PFBA)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorononanoic acid (PFNA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Sum of PFAS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Data Validation Report
Biota RPDs
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Base Darwin

Biota - Relative Percentage Differences

Lab Report	ES2240147	ES2240147		ES2240147	ES2240147		ES2240147	ES2240147		ES2240147	ES2240147	
Field ID	1302_BIOAFA258_221025	1302_QC140_221025	**RPD**	1302_BIOAFA259_221025	1302_QC141_221025	**RPD**	1302_BIOAFA260_221025	1302_QC142_221025	**RPD**	1302_BIOAFA261_221025	1302_QC143_221025	**RPD**
Sample Type	Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate	
Date	25/10/2022	25/10/2022		25/10/2022	25/10/2022		25/10/2022	25/10/2022		25/10/2022	25/10/2022	
Analyte	**Units**	**LOR**										
PFAS Full Suite												
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorobutanoic acid (PFBA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorononanoic acid (PFNA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
PFOS - Branched	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
PFOS - Linear	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Sum of PFAS	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorooctanoic Acid (PFOA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Data Validation Report
Biota RPDs
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Base Darwin

Biota - Relative Percentage Differences

AECOM

Lab Report		ES2240147	ES2240147		ES2240147	ES2240147		ES2240147	ES2240147		ES2240147	ES2240147	
Field ID		1302_BIOAFA262_221025	1302_QC144_221026	**RPD**	1302_BIOAFA263_221025	1302_QC145_221026	**RPD**	1302_BIOAFA264_221025	1302_QC146_221026	**RPD**	1302_BIOAFA265_221025	1302_QC147_221026	**RPD**
Sample Type		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate	
Date		25/10/2022	25/10/2022		25/10/2022	25/10/2022		25/10/2022	25/10/2022		25/10/2022	25/10/2022	
Analyte	**Units**	**LOR**											
PFAS Full Suite													
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorobutanoic acid (PFBA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorononanoic acid (PFNA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.005	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0	<0.005	<0.005	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.002	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0	<0.002	<0.002	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
PFOS - Branched	mg/kg	0.001	<0.001	0.001	0	<0.001	<0.001	0	<0.001	0.001	0	<0.001	<0.001	0
PFOS - Linear	mg/kg	0.001	<0.001	0.001	0	<0.001	<0.001	0	<0.001	0.007	150	<0.001	0.002	67
Sum of PFAS	mg/kg	0.001	<0.001	0.002	67	<0.001	<0.001	0	<0.001	0.008	156	<0.001	0.004	120
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.001	<0.001	0.002	67	<0.001	<0.001	0	<0.001	0.008	156	<0.001	0.002	67
Perfluorooctanoic Acid (PFOA)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	0.002	67

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Data Validation Report
Water RPDs
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Base Darwin

Water - Relative Percentage Differences

AECOM

Lab Report		ES2242803	ES2242803		ES2242803	ES2242803		ES2242803	ES2242803		ES2246451	ES2246451		ES2302423	ES2302423	
Field ID		1302_SW106_221123	1302_QC101_221123	**RPD**	1302_SW132_221124	1302_QC100_221124	**RPD**	1302_SW125_221123	1302_QC100_221123	**RPD**	1302_SW109_221222	1302_QC100_221222	**RPD**	1302_SW300_230125	1302_QC100_230125	**RPD**
Sample Type		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate	
Date		23/11/2022	23/11/2022		24/11/2022	24/11/2022		23/11/2022	23/11/2022		22/12/2022	22/12/2022		25/01/2023	25/01/2023	
Analyte	**Units**	**LOR**														
PFAS Full Suite																
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<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
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<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
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<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 (Interlab)	<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 : 0.02 (Interlab)	<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 sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<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 (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.03	0.03	0	<0.02	<0.02	0	0.08	0.1	22	0.03	0.03	0	0.22	0.2	10
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	0.2	0.2	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	0.03	0.03	0	<0.02	<0.02	0	0.06	0.07	15	<0.02	<0.02	0	0.04	0.04	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	0.03	0.03	0	<0.02	<0.02	0	0.25	0.25	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.03	0.03	0	<0.02	<0.02	0	0.17	0.2	16	0.05	0.06	18	0.42	0.41	2
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	0.02	0.03	40
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.03	0.03	0	<0.02	<0.02	0	0.11	0.12	9	0.03	0.03	0	0.18	0.18	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	0.05	0.06	18	<0.02	<0.02	0	0.29	0.3	3
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<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
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Sum of PFAS	µg/L	0.01	0.59	0.64	8	0.1	0.1	0	3.58	4.09	13	0.83	0.93	11	3.51	3.59	2
Sum of PFHxS and PFOS	µg/L	0.01	0.47	0.52	10	0.1	0.1	0	3.02	3.45	13	0.71	0.8	12	1.64	1.72	5
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	0.28	0.32	13	0.07	0.07	0	1.95	2.27	15	0.46	0.53	14	0.71	0.77	8
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.06	0.06	0	0.01	0.01	0	0.25	0.26	4
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.19	0.2	5	0.03	0.03	0	1.07	1.18	10	0.25	0.27	8	0.93	0.95	2

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

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Water - Relative Percentage Differences

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	Lab Report	ES2305982	ES2305982		ES2310999	ES2310999		ES2310999	ES2310999		ES2310999	ES2310999		ES2310999	ES2310999	
	Field ID	1302_SW300 _230221	1302_QC100_230221	**RPD**	1302_MW115_230314	1302_QC100_230314	**RPD**	1302_MW180_230320	1302_QC100_230320	**RPD**	1302_MW176_230320	1302_QC101_230320	**RPD**	1302_MW454_230322	1302_QC102_230322	**RPD**
	Sample Type	Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate	
	Date	21/02/2023	21/02/2023		14/03/2023	14/03/2023		20/03/2023	20/03/2023		20/03/2023	20/03/2023		22/03/2023	22/03/2023	
Analyte	**Units**	**LOR**														
PFAS Full Suite																
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<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
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<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
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<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 (Interlab)	<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 : 0.02 (Interlab)	<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 sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<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 (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	1.47	1.63	10	<0.02	<0.02	0	<0.02	<0.02	0	1.31	1.35	3
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	0.2	0.2	0	<0.1	<0.1	0	<0.1	<0.1	0	0.3	0.3	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	0.06	0.07	15	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	1.39	1.65	17	<0.02	<0.02	0	<0.02	<0.02	0	1.18	1.28	8
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	0.02	<0.02	0	0.34	0.38	11	<0.02	<0.02	0	<0.02	<0.02	0	0.23	0.25	8
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.05	0.03	50	3.16	3.51	10	<0.02	<0.02	0	<0.02	<0.02	0	2.15	2.23	4
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	0.1	0.1	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	2.12	2.35	10	<0.02	<0.02	0	<0.02	<0.02	0	1.84	1.84	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	0.03	<0.02	40	0.56	0.63	12	<0.02	<0.02	0	<0.02	<0.02	0	0.5	0.53	6
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<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
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Sum of PFAS	µg/L	0.01	0.36	0.42	15	74	76.2	3	0.09	0.11	20	0.12	0.17	34	48.9	49.3	1
Sum of PFHxS and PFOS	µg/L	0.01	**0.24**	**0.37**	**43**	63.6	64.5	1	0.09	0.11	20	0.12	0.17	34	40.8	40.9	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	**0.15**	**0.26**	**54**	47.3	47.6	1	0.01	0.02	67	0.08	0.12	40	28.2	28	1
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.02	0.02	0	1.01	1.14	12	<0.01	<0.01	0	<0.01	<0.01	0	0.57	0.59	3
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.09	0.11	20	16.3	16.9	4	0.08	0.09	12	0.04	0.05	22	12.6	12.9	2

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Data Validation Report
Water RPDs
PFAS Ongoing Monitoring Plan
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Water - Relative Percentage Differences

AECOM

Lab Report		ES2311000	ES2311000		ES2311000	ES2311000		ES2311000	ES2311000		ES2312996	ES2312996		ES2242803	RN1374784	
Field ID		1302_SW132_230327	1302_QC100_230327	**RPD**	1302_SW178_230328	1302_QC101_230328	**RPD**	1302_SW112_230328	1302_QC102_230328	**RPD**	1302_MW144_230420	1302_QC100_230120	**RPD**	1302_SW106_221123	1302_QC201_221123	**RPD**
Sample Type		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Intra-lab Duplicate		Primary	Inter-lab Duplicate	
Date		27/03/2023	27/03/2023		28/03/2023	28/03/2023		28/03/2023	28/03/2023		20/04/2023	20/04/2023		23/11/2022	23/11/2022	
Analyte	**Units**	**LOR**														
PFAS Full Suite																
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.01	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	0.2	0.19	5	0.03	0.018	50
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	0.1	0.1	0	0.03	<0.01	100
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	0.03	0.03	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	0.04	0.04	0	0.23	0.22	4	0.03	0.019	45
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	0.02	0.02	0	0.21	0.21	0	0.03	0.015	67
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	0.04	0.04	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.05	0	<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.01	0
Sum of PFAS	µg/L	0.01	0.3	0.32	6	0.04	0.04	0	0.59	0.62	5	4.62	4.44	4	**0.59**	**0.422**	**32**
Sum of PFHxS and PFOS	µg/L	0.01	0.3	0.32	6	0.04	0.04	0	0.52	0.55	6	3.75	3.59	4	0.47	0.37	23
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	0.2	0.23	14	0.04	0.04	0	0.36	0.38	5	2.13	1.98	7	**0.28**	**0.2**	**33**
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0	0.01	0.01	0	0.06	0.06	0	<0.01	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	0.1	0.09	11	<0.01	<0.01	0	0.16	0.17	6	1.62	1.61	1	0.19	0.17	11

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Data Validation Report
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Water - Relative Percentage Differences

AECOM

	Lab Report	ES2242803	RN1374784		ES2242803	RN1374784		ES2246451	RN1377705		ES2302423	RN1381361		ES2305982	RN1384540	
	Field ID	1302_SW125_221123	1302_QC200_221123	**RPD**	1302_SW132_221124	1302_QC200_221124	**RPD**	1302_SW109_221222	1302_QC200_221222	**RPD**	1302_SW300_230125	1302_QC200_230125	**RPD**	1302_SW300 _230221	1302_QC200_230221	**RPD**
	Sample Type	Primary	Inter-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Inter-lab Duplicate	
	Date	23/11/2022	23/11/2022		24/11/2022	24/11/2022		22/12/2022	22/12/2022		25/01/2023	25/01/2023		21/02/2023	21/02/2023	
Analyte	**Units**	**LOR**														
PFAS Full Suite																
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.01	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	0.08	0.064	22	<0.02	<0.01	0	0.03	0.05	50	0.22	0.19	15	<0.02	0.012	0
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	<0.1	<0.05	0	<0.1	<0.05	0	<0.1	<0.1	0	0.2	0.16	22	<0.1	<0.05	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	0.06	0.037	47	<0.02	<0.01	0	<0.02	<0.02	0	0.04	<0.01	120	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	0.03	0.019	45	<0.02	<0.01	0	<0.02	<0.02	0	0.25	0.22	13	0.02	<0.01	67
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	0.17	0.13	27	<0.02	<0.01	0	0.05	0.027	59	0.42	0.36	15	0.05	0.026	63
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	0.02	0.022	10	<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	0.11	0.074	39	<0.02	<0.01	0	0.03	0.03	0	0.18	0.14	25	<0.02	0.014	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	0.05	0.035	35	<0.02	<0.02	0	<0.02	<0.02	0	0.29	0.22	27	0.03	<0.02	40
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.01	0
Sum of PFAS	µg/L	0.01	**3.58**	**2.526**	**34**	0.1	0.075	28	0.83	0.697	17	**3.51**	**2.152**	**47**	0.36	0.37	2
Sum of PFHxS and PFOS	µg/L	0.01	**3.02**	**2.12**	**35**	0.1	0.075	28	0.71	0.59	18	**1.64**	**0.63**	**88**	0.24	0.31	25
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	**1.95**	**1.2**	**48**	0.07	0.049	35	0.46	0.38	19	0.71	0.62	14	0.15	0.22	38
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	0.06	0.037	47	<0.01	<0.01	0	0.01	<0.01	0	0.25	0.22	13	0.02	0.01	67
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	1.07	0.92	15	0.03	0.026	14	0.25	0.21	17	**0.93**	**<0.01**	**196**	0.09	0.094	4

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

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Water - Relative Percentage Differences

Lab Report		ES2310999	RN1389152		ES2310999	RN1389152		ES2310999	RN1389152		
Field ID		1302_MW115_230314	1302_QC200_230314	**RPD**	1302_MW180_230320	1302_QC200_230320	**RPD**	1302_MW176_230320	1302_QC201_230320	**RPD**	
Sample Type		Primary	Inter-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Inter-lab Duplicate		
Date		14/03/2023	14/03/2023		20/03/2023	20/03/2023		20/03/2023	20/03/2023		
Analyte	**Units**	**LOR**									
PFAS Full Suite											
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	1.47	1.3	12	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	0.2	0.27	30	<0.1	<0.05	0	<0.1	<0.05	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	0.06	<0.01	143	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	**1.39**	**0.99**	**34**	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	0.34	0.27	23	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	**3.16**	**2.3**	**32**	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	0.1	0.03	108	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	**2.12**	**1.4**	**41**	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	0.56	0.44	24	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Sum of PFAS	µg/L	0.01	**74**	**54.09**	**31**	0.09	0.065	32	0.12	0.095	23
Sum of PFHxS and PFOS	µg/L	0.01	**63.6**	**44**	**36**	0.09	0.065	32	0.12	0.095	23
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	**47.3**	**30**	**45**	0.01	<0.02	0	0.08	0.058	32
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	1.01	0.79	24	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	16.3	14	15	0.08	0.065	21	0.04	0.035	13

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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

Data Validation Report
Water RPDs
PFAS Ongoing Monitoring Plan
Department of Defence - RAAF Base Darwin

Water - Relative Percentage Differences

AECOM

Lab Report			ES2310999	RN1389152		ES2311000	RN1389154		ES2311000	RN1389154		ES2311000	RN1389154		ES2312445	RN1390587	
Field ID			1302_MW454_230322	1302_QC202_230322	**RPD**	1302_SW132_230327	1302_QC200_230327	**RPD**	1302_SW178_230328	1302_QC201_230328	**RPD**	1302_SW112_230328	1302_QC202_230328	**RPD**	1302_SW170_230414	1302_QC200_230414	**RPD**
Sample Type			Primary	Inter-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Inter-lab Duplicate		Primary	Inter-lab Duplicate	
Date			22/03/2023	22/03/2023		27/03/2023	27/03/2023		28/03/2023	28/03/2023		28/03/2023	28/03/2023		14/04/2023	14/04/2023	
Analyte	**Units**	**LOR**															
PFAS Full Suite																	
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FtS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.05 : 0.01 (Interlab)	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0	<0.05	<0.01	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	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
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MFOSAA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	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
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.02 : 0.01 (Interlab)	1.31	1	27	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	0.012	0	<0.02	<0.01	0
Perfluorobutanoic acid (PFBA)	µg/L	0.1 : 0.05 (Interlab)	0.3	0.23	26	<0.1	<0.05	0	<0.1	<0.05	0	<0.1	<0.05	0	<0.1	<0.05	0
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02 : 0.01 (Interlab)	**1.18**	**0.48**	**84**	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02 : 0.01 (Interlab)	0.23	0.18	24	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.02 : 0.01 (Interlab)	2.15	1.6	29	<0.02	<0.01	0	<0.02	<0.01	0	0.04	0.028	35	<0.02	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.02 : 0.01 (Interlab)	**1.84**	**1.1**	**50**	<0.02	<0.01	0	<0.02	<0.01	0	0.02	0.014	35	<0.02	<0.01	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.02	**0.5**	**0.36**	**33**	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05 : 0.02 (Interlab)	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0	<0.05	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.02	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02 : 0.01 (Interlab)	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0	<0.02	<0.01	0
Sum of PFAS	µg/L	0.01	**48.9**	**27.51**	**55**	0.3	0.216	14	0.04	0.026	42	**0.59**	**0.434**	**30**	**0.19**	**0.108**	**55**
Sum of PFHxS and PFOS	µg/L	0.01	**40.8**	**67.30**	**67**	0.3	0.216	14	0.04	0.026	42	**0.52**	**0.38**	**31**	**0.19**	**0.108**	**55**
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01 : 0.02 (Interlab)	**28.2**	**14**	**67**	0.2	0.14	35	0.04	0.026	42	**0.36**	**0.25**	**36**	**0.16**	**0.092**	**54**
Perfluorooctanoic Acid (PFOA)	µg/L	0.01	**0.57**	**0.36**	**45**	<0.01	<0.01	0	<0.01	<0.01	0	0.01	<0.01	0	<0.01	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	**12.6**	**8.2**	**42**	0.1	0.076	27	<0.01	<0.01	0	0.16	0.13	21	0.03	0.016	61

**High RPDs are in bold (Acceptable RPDs for each LOR multiplier range are: 200 (1-10 x LOR); 50 (10-20 x LOR); 30 (> 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 E

Chain of Custody

D R A F T

Appendix E Chain of Custody

AECOM 1302 PAGE 1 of 6 **Chain of Custody**

AECOM Australia Pty Ltd
[redacted]

Laboratory Details
Lab. Name: [redacted]
Lab. [redacted]
Contact Name [redacted]
Lab. Ref:

Tel: [redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

AECOM Project #: 60612561 **Purchase Order No:**

Specifications: Please report in ESdat format RE-FREEZE BIOTA SAMPLES

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	Y

6. Report Format: • ESdat 7. Project Manager:

Analysis Request

Environmental Division
[redacted]
ES2240147

Telephone : [redacted]

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Matrix:	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	HOLD	Notes
1	1302_BIOAFA258_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
2	1302_BIOAFA259_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
3	1302_BIOAFA260_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
4	1302_BIOAFA261_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
5	1302_BIOAFA262_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
6	1302_BIOAFA263_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
7	1302_BIOAFA264_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
8	1302_BIOAFA265_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
9	1302_BIOAFA266_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
10	1302_BIOAFA267_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
11	1302_BIOAFA268_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
12	1302_BIOAFA269_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
13	1302_BIOAFA270_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
14	1302_BIOAFA271_221025	25 Oct 2022	X						X	Snap bag	X	Frozen

Comments: Please send ESdat files [redacted] the files use the PROJECT NAME

[redacted] mp. received: °C

Report & Invoice: [redacted]

Lab Report No. | ESdy ID

Relinquished by: [redacted] Signed: [redacted] Date: 4/11/2022

Received by: [redacted] Signed: [redacted] Date: 8/11/22 @ 38

Relinquished by: Signed: Date:

Received by: Signed: Date:

Subcon / Forward Lab (Split WO ES2240240 (WATER)
Lab / Analysis:
Organised By / Date:
Relinquished By / Date:
Connote / Courier:
WO No:
Attached By PO / Internal Sheet:

AECOM

1302 PAGE 2 of 6 Chain of Custody

AECOM Australia Pty Ltd

[redacted]

Laboratory Details
Lab. Name: ALS
Lab. Address [redacted]
Contact Name [redacted]
Lab. Ref:

Tel: [redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

AECOM Project #: 60612561 **Purchase Order No:**

Specifications: Please report in ESdat format RE-FREEZE BIOTA SAMPLES

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	Y

6. Report Format: • ESdat 7. Project Manager:

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Matrix:	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	HOLD	Notes
15	1302_BIOAFA272_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
16	1302_BIOAFA273_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
17	1302_BIOAFA274_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
18	1302_BIOAFA275_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
19	1302_BIOAFA276_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
20	1302_BIOAFA277_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
21	1302_BIOAFA278_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
22	1302_BIOAFA279_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
23	1302_BIOAFA280_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
24	1302_BIOAFA281_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
25	1302_BIOAFA282_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
26	1302_BIOAFA283_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
27	1302_BIOAFA284_221029	29 Oct 2022	X						X	Snap bag	X	Frozen
28	1302_BIOAFA285_221029	29 Oct 2022	X						X	Snap bag	X	Frozen

Comments: Please send ESdat fi[redacted] Temp. received: °C Report & invoic[redacted] Lab Report No. Esky ID

Relinquished by: [redacted]	Signed:	Date: 4/11/2022	Relinquished by:	Signed:	Date:
Received by:	Signed:	Date:	Received by:	Signed:	Date:

AECOM 1302 PAGE 3 of 6 **Chain of Custody**

AECOM Australia Pty Ltd
[redacted]

Laboratory Details
Lab. Name: ALS
Lab. Addres[redacted]
Contact Nan[redacted]
Lab. Ref:
Tel: [redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

AECOM Project #: 60612561 **Purchase Order No:**

Specifications: Please report in ESdat format RE-FREEZE BIOTA SAMPLES

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	Y

6. Report Format: • ESdat 7. Project Manager:

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Matrix:	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	Analysis Request	HOLD	Notes
29	1302_BIOAFA286_221029	29 Oct 2022	X						X	Snap bag		X	Frozen
30	1302_BIOAFA287_221029	29 Oct 2022	X						X	Snap bag		X	Frozen
31	1302_BIOAFA288_221029	29 Oct 2022	X						X	Snap bag		X	Frozen
32	1302_BIOAFA289_221026	26 Oct 2022	X						X	Snap bag		X	Frozen
33	1302_BIOAFA290_221026	26 Oct 2022	X						X	Snap bag		X	Frozen
34	1302_BIOAFA291_221026	26 Oct 2022	X						X	Snap bag		X	Frozen
35	1302_BIOAFA292_221026	26 Oct 2022	X						X	Snap bag		X	Frozen
36	1302_BIOAFA293_221026	26 Oct 2022	X						X	Snap bag		X	Frozen
37	1302_BIOAFA294_221026	26 Oct 2022	X						X	Snap bag		X	Frozen
38	1302_BIOAFA295_221026	26 Oct 2022	X						X	Snap bag		X	Frozen
39	1302_BIOAFA296_221026	26 Oct 2022	X						X	Snap bag		X	Frozen
40	1302_BIOAFA297_221026	26 Oct 2022	X						X	Snap bag		X	Frozen
41	1302_BIOAFA298_221026	26 Oct 2022	X						X	Snap bag		X	Frozen
42	1302_BIOAFA299_221026	26 Oct 2022	X						X	Snap bag		X	Frozen

Comments: Please send ESdat files to [redacted] the files use the PROJECT
Temp. received: °C
Report & invoice: [redacted]
Lab Report No Esky ID

Relinquished by: [redacted]	Signed:	Date: 4/11/2022	Relinquished by:	Signed:	Date:
Received by:	Signed:	Date:	Received by:	Signed:	Date:

AECOM

 Chain of Custody

AECOM Australia Pty Ltd

[redacted]

Laboratory Details

Lab. Name: ALS

Lab. Addres [redacted]

Contact Nar

Lab. Ref:

Tel: [redacted]

Fax:

Preliminary Report by:

Final Report by:

Lab Quote No: SY/139/19 v2

AECOM Project #: 60612561 **Purchase Order No:**

Specifications: Please report in ESdat format RE-FREEZE BIOTA SAMPLES

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	Y

6. Report Format: • ESdat 7. Project Manager:

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Matrix:	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	Analysis Request: HOLD	Notes
43	1302_BIOAFA300_221026	26 Oct 2022	X						X	Snap bag	X	Frozen
44	1302_BIOAFA301_221026	26 Oct 2022	X						X	Snap bag	X	Frozen
45	1302_BIOAFA302_221026	26 Oct 2022	X						X	Snap bag	X	Frozen
46	1302_BIOAFA303_221026	26 Oct 2022	X						X	Snap bag	X	Frozen
47	1302_BIOAFA304_221026	26 Oct 2022	X						X	Snap bag	X	Frozen
48	1302_BIOAFA305_221026	26 Oct 2022	X						X	Snap bag	X	Frozen
49	1302_BIOAFA306_221031	31 Oct 2022	X						X	Snap bag	X	Frozen
50	1302_BIOAFA307_221031	31 Oct 2022	X						X	Snap bag	X	Frozen
51	1302_BIOAFA308_221031	31 Oct 2022	X						X	Snap bag	X	Frozen
52	1302_BIOAFA309_221031	31 Oct 2022	X						X	Snap bag	X	Frozen
53	1302_BIOAFA310_221031	31 Oct 2022	X						X	Snap bag	X	Frozen
54	1302_BIOAFA311_221031	31 Oct 2022	X						X	Snap bag	X	Frozen
55	1302_BIOAFA312_221031	31 Oct 2022	X						X	Snap bag	X	Frozen
56	1302_BIOAFA313_221031	31 Oct 2022	X						X	Snap bag	X	Frozen

Comments: Please send ESdat files to [redacted] the files use the PROJECT NAME

Temp. received: °C

Report & invoice [redacted]

Lab Report No ESky ID

Relinquished by: [redacted]	Signed:	Date: 4/11/2022	Relinquished by:	Signed:	Date:
Received by:	Signed:	Date:	Received by:	Signed:	Date:

AECOM

 Chain of Custody

AECOM Australia Pty Ltd

[redacted]

Laboratory Details

Lab. Name: ALS

Lab. Address [redacted]

Contact Nam[redacted]

Lab. Ref:

Tel: [redacted]

Fax:

Preliminary Report by:

Final Report by:

Lab Quote No: SY/139/19 v2

AECOM Project #: 60612561

Purchase Order No.:

Specifications: Please report in ESdat format RE-FREEZE BIOTA SAMPLES

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	Y

6. Report Format: • ESdat 7. Project Manager:

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Matrix:	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	HOLD	Notes
57	1302_BIOAFA314_221031	31 Oct 2022	X						X	Snap bag	X	Frozen

Comments: **Please send ESdat files to** [redacted] **the files use the PROJECT NAME**

emp. received: °C

Report & invoice [redacted]

Lab Report ID | Esky ID

Relinquished by: [redacted]	Signed:	Date: 4/11/2022	Relinquished by:	Signed:	Date:
Received by:	Signed:	Date:	Received by:	Signed:	Date:

AECOM

 Chain of Custody

AECOM Australia Pty Ltd
[redacted]

Laboratory Details
Lab. Name: ALS
Lab. Addres[redacted]
Contact Nan[redacted]
Lab. Ref:

Tel: [redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No: SY/139/19 v2

AECOM Project #: 60612561 **Purchase Order No:**

Specifications: Please report in ESdat format RE-FREEZE BIOTA SAMPLES

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	Y

6. Report Format: • ESdat 7. Project Manager:

Analysis Request

Lab. ID	Sample ID	Sampling Date	Matrix: biota	Matrix: water	Matrix:	Preservation: filtered	Preservation: acid	Preservation: ice	Preservation: frozen	Container (No. & type)	HOLD	Notes
~~58~~	1302_QC139_221025	25 Oct 2022		X				X		Bottle	X	Surface Water
59	1302_QC140_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
60	1302_QC141_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
61	1302_QC142_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
62	1302_QC143_221025	25 Oct 2022	X						X	Snap bag	X	Frozen
63	1302_QC144_221026	26 Oct 2022	X						X	Snap bag	X	Frozen
64	1302_QC145_221026	26 Oct 2022	X						X	Snap bag	X	Frozen
65	1302_QC146_221026	26 Oct 2022	X						X	Snap bag	X	Frozen
66	1302_QC147_221026	26 Oct 2022	X						X	Snap bag	X	Frozen
~~67~~	1302_QC304_221031	31 Oct 2022		X				X		Bottle	X	Rinsate
~~68~~	1302_QC504_221024	24 Oct 2022		X				X		Bottle	X	Trip Blank

Comments: **Please send ESdat files [redacted] the files use the PROJE**

Temp. received: °C

Report & invoice: [redacted]

Lab Report N Esky ID

Relinquished by: [redacted]	Signed:	Date: 4/11/2022	Relinquished by:	Signed:	Date:
Received by:	Signed:	Date:	Received by:	Signed:	Date:

AECOM

 Chain of Custody

AECOM Australia Pty Ltd

[redacted]

Laboratory Details

Lab. Name: ALS

Lab. Address: [redacted]

Contact Name [redacted]

Lab. Ref:

Tel: [redacted]

Fax:

Preliminary Report by:

Final Report by:

Lab Quote No: SY/139/19 v2

AECOM Project #: 60612561 **Purchase Order No:**

Specifications: Please report in ESdat format RE-FREEZE BIOTA SAMPLES

	Yes (tick)
1. Urgent TAT required? (please circle: 24hr 48hr 5 days)	
2. Fast TAT Guarantee Required?	
3. Is any sediment layer present in waters to be excluded from extractions?	
4. % extraneous material removed from samples to be reported as per NEPM 5.1.1?	
5. Special storage requirements? (details: RE-FREEZE BIOTA SAMPLES)	Y
6. Report Format: • ESdat 7. Project Manager:	

Lab. ID	Sample ID	Sampling Date	Matrix			Preservation				Container (No. & type)	Analysis Request HOLD	Notes
			biota	water		filt'ed	acid	ice	frozen			
~~69~~ 61	1302_SW019_221025	25 Oct 2022		X				X		Bottle	X	Surface Water
~~70~~	1302_SW020_221026	26 Oct 2022		X				X		Bottle	X	Surface Water
~~71~~	1302_SW021_221029	29 Oct 2022		X				X		Bottle	X	Surface Water
~~72~~	1302_SW022_221029	29 Oct 2022		X				X		Bottle	X	Surface Water
~~73~~	1302_SW023_221029	29 Oct 2022		X				X		Bottle	X	Surface Water
~~74~~	1302_SW024_221029	29 Oct 2022		X				X		Bottle	X	Surface Water

Comments: Please send ESdat files to DE[redacted] the files use the PROJECT NAME

Temp. received: °C

Report & invoice [redacted]

Lab Report No Esdat ID

Relinquished by: [redacted]	Signed:	Date: 4/11/2022	Relinquished by:	Signed:	Date:
Received by:	Signed:	Date:	Received by:	Signed:	Date:

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com

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MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com

NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

ORANGE 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2933 E: nowra@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

TOWNSVILLE Ld. 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: [redacted]		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: NT_1302_PFASOMP	ALS QUOTE NO.: SY/139/19 V3	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: 60612561 / 4.1		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
[redacted]		OF: 1 2 3 4 5 6 7	Other comment:

COC emailed to ALS? (YES / NO) EDD FORMAT (or default):	RELINQUISHED BY: [redacted]	RECEIVED BY: [redacted]	RELINQUISHED BY: [redacted]	RECEIVED BY: [redacted]
[redacted]	DATE/TIME:	DATE/TIME: 29/11 2:45 p.m	DATE/TIME: 30/11	DATE/TIME: Dec 1, 2022 8:30am

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PREservative (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	1302_GW160_221125	25/11/22	W		2	✓								
2	1302_SW180_221125	25/11/22	W		2	✓								
3	1302_SW300_221125	25/11/22	W		2	✓								
4	1302_QC300_221125	25/11/22	W		2	✓								
5	1302_QC400_221125	25/11/22	W		2	✓								
				TOTAL										

LAB OF ORIGIN: DARWIN

Environmental Division Sydney
Work Order Reference
ES2243233

Telephone : [redacted]

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0290 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GOLDSTONE 46 Colemanwith Drive Clinton QLD 4680 Ph: 07 3471 5600 E: gladstone@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 348 Wedell Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
MURDOCH 27 Sydney Road Rudgine NSW 2650 Ph: 02 6372 6735 E: rudgine.mail@alsglobal.com
NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
TOWNSVILLE 14-16 Dagma Court Bohle QLD 4818 Ph: 07 4796 0600 E: samples.townsville@alsglobal.com
WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: AECOM	**TURNAROUND REQUIREMENTS :** (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE: [redacted]		
PROJECT: NT_1302_PFASOMP	**ALS QUOTE NO.:** SY/139/19 V3	**COC SEQUENCE NUMBER (Circle)** COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
ORDER NUMBER: 60612561 / 4.1		
[redacted]		
COC emailed to ALS? (YES / NO) **EDD FORMAT (or default):**	**RELINQUISHED BY:** [redacted] DATE/TIME:	**RECEIVED BY:** [redacted] DATE/TIME:
[redacted]	**RELINQUISHED BY:** DATE/TIME:	**RECEIVED BY:** [redacted] DATE/TIME: 29/11/22 0830

FOR 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 comment:			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).										Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X										
1	1302_SW106_221123	23/11/22	W	P	2	X										
2	1302_QC01_221123	"	W	"	2	X										
3	1302_QC201_221123	"	W	"	2	X										Please send to NMI SYDNEY.
4	1302_SW114_221123	"	W	"	2	X										
5	1302_SW104_221123	"	W	"	2	X										
6	1302_SW132_221124	24/11/22	W	"	2	X										
7	1302_MW02_221124	24/11/22	W	"	2	X										
8	1302_QC200_221124	"	W	"	2	X										
9	1302_SW133_221124	"	W	"	2	X										
10	1302_SW103_221124	"	W	"	2	X										
11	1302_SW170_221124	"	W	"	2	X										
12	1302_SW162_221125	25/11/22	W	"	2	X										
				TOTAL	24											

Environmental Division Sydney
Work Order Reference
ES2242803

Telephone : [redacted]

Received By / Date: QC201/QC200
Relinquished By / Date:
Compile / Courier: QC forms
WO No.: ES2242803
Attach By FOO / Courier:

ORIGIN: DARWIN

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GOLD COAST 46 Cameron St Biggera Waters QLD 4216 Ph: 07 5644 8000 E: goldcoast@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
NEWCASTLE Unit 1, Hadfield Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
ORANGE 10 Warne Street Orange NSW 2800 Ph: 02 6372 6735 E: orange@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7500 E: samples.perth@alsglobal.com
SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: sydney@alsglobal.com
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WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☒ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: [redacted]		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: NT_1302_PFASOMP	ALS QUOTE NO.: SY/139/19 V3	COC SEQUENCE NUMBER (Circle)	Free Ice / frozen Ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: 60612561 / 4.1		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: C
[redacted]		OF: 1 2 3 4 5 6 7	Other comment:

COC emailed to ALS? (YES / NO) EDD FORMAT (or default):	RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
[redacted]	DATE/TIME:	[redacted] DATE/TIME:	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
13	1302-SW125_221125	23/11/22	W	P	2	X								
14	1302-QC100_221123	23/11/22	W	"	2	X								
~~15~~	1302-QC200_221123	23/11/22	W	"	2	X								please send to NMI SYDNEY
16	1302-SW120_221125	23/11/22	W	"	2	X								
17	1302-SW124_221123	23/11/22	W	"	2	X								
18	1302-SW113_221123	"	W	"	2	X								
19	1302-SW112-221123	"	W	"	2	X								
20	1302-SW109-221123	"	W	"	2	X								
21	1302-SW156-221123	"	W	"	2	X								
22	1302-SW168_221123	"	W	"	2	X								
23	1302-SW108_221123	"	W	"	2	X								
24	1302-SW115-221123	"	W	"	2	X								
				TOTAL	24									

LAB OF ORIGIN: DARWIN

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

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WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	☒ Standard TAT (List due date):
OFFICE: [redacted]		☐ Non Standard or urgent TAT (List due date):
PROJECT: NT_1302_PFASOMP	ALS QUOTE NO.: SY/139/19 V3	
ORDER NUMBER: 60612561 / 4.1		
[redacted]		
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
[redacted]		

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7

OF: 1 2 [redacted] 5 6 7

FOR 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 comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQU[redacted]	RECEIVED BY:
[redacted]	[redacted]		
DATE/TIME:	DATE/TIME: 28/11/22	DATE/TIME: 28/11/22	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								
25	1302_SW178_22125	25/11/22	W	P	2	X								
26	1302_QC302_22124	24/11/22	W	"	2	X								
27	1302_QC400_22124	24/11/22	W	"	2	X								
				TOTAL										

LAB OF ORIGIN: DARWIN

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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CAIRNS UNIT 16 Caldermeade Drive Caravan QLD 4870 Ph: 07 4474 5600 E: geodrill@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 07 8549 9600 E: samples.melbourne@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
WAGGA WAGGA 1/13 Gearty Place North Wagga NSW 2650 Ph: 02 6922 1060 E: wagga@alsglobal.com
SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
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CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	⊗ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: [redacted]		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: NT_1302_PFASOMP	ALS QUOTE NO.: SY/139/19 V3	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: 60612561 / 4.1		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
[redacted]		OF: 1 [redacted] 5 6 7	Other con[redacted]

COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RELINQUISHED BY:	RECEIVED B[redacted]
[redacted]		DATE/TIME:	DATE/TIME: 22/12 9:13 AM
		RELINQUISHE[redacted]	RECEIVED BY: [redacted]
		DATE/TIME: 22/12/22 9.13AM	DATE/TIME: 23/12/22 1030

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X							Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	Blank												
1	1302_SW170_221222	22.12.22	W		2	X							
2	1302_SW312_221222	22/12.22	W		2	X							
3	1302_SW109_221222	22/12/22	W		2	X							
4	1302_QC100_221222	22/12/22	W		2	X							
5	1302_QC200_221222	↓	W		2	X							
6	1302_QC300_221222		W		2	X							
7	1302_QC600_221222		W		2	X							
SMR 8	1302_QC500_221222		W		2	X							

Subtot / Forward to NMI / Split WO
Lab / Analysis:
Organised By / Date:
Relinquished By / Date:
Courier / Courier: External QC
WO No: ES2246451
Attach By PO / Internal Sheet:

LAB OF ORIGIN: DARWIN

Environmental Division Sydney
Work Order Reference
ES2246451

Telephone [redacted]

please send to NMI Sydney.

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 7471 5600 E: gladstone@alsglobal.com
MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 24 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.reid@alsglobal.com
NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ⊛ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:	
PROJECT: NT_1302_PFASOMP 23	ALS QUOTE NO.: SY/139/19 V3
ORDER NUMBER: 60612561 / 4.1**	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 6 7
[redacted]	
COC emailed to ALS? (YES / NO) [redacted]	EDD FORMAT (or default):

FOR 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 comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
[redacted]	[redacted]		[redacted]
DATE/TIME: 3/04/23	DATE/TIME: 3/4/23 12:40pm	DATE/TIME:	DATE/TIME: 04/04/23 1430

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	1302_MW115_230314	14.03.23	W		2	X	
2	1302-MW205_230314	14.03.23	W		2	X	
3	1302_MW112_230314	14.03.23	W		2	X	
4	1302_MW156_230314	14.03.23	W		2	X	
5	1302_QC100_230314	14.03.23	W		2	X	
—	1302_QC200_230314	14.03.23	W		2	X	
6	1302-MW80_230320	20.03.23	W		2	X	PLEASE SEND TO NMI SYDNEY
7	1302-QC100_230320	20.03.23	W		2	X	
—	1302-QC200_230320	20.03.23	W		2	X	
9	1302-MW211_230320	20.03.23	W		2	X	
10	1302-MW200_230320	20.03.23	W		2	X	
11	1302_MW176_230320	20.03.23	W		2	X	
				TOTAL	24		

Environmental Division
Sydney
Work Order Reference
ES2310999

Telephone [redacted]

Subcon / Forward Lab / Split No:
Lab / Analysis: NMI
Organised By / Date: QC200s
Relinquished By / Date:
Connote / Courier: QC FWD
WO No.: ES2310999
Attach. By PO / Internal Sheet:
ES2310999

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
TOWNSVILLE 14-16 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ⊗ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:	
PROJECT: NT_1302_PFASOMP 23	ALS QUOTE NO.: SY/139/19 V3
ORDER NUMBER: 60612561 / 4.1**	
[redacted]	
COC emailed to ALS? (YES / NO) EDD FORMAT (or default):	RELINQUISHED BY: [redacted] DATE/TIME: 3/04/23
[redacted]	

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 5 6 7
OF: 1 2 3 4 5 6 7

FOR 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 comment:

RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE/TIME:	DATE/TIME:	[redacted] DATE/TIME: 04/04/23 1430

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
12	1302_MW235_230322	22.03.23	W		2	X								
13	1302_MW139_230322	22.03.23	W		2	X								
14	1302_MW141_230322	22.03.23	W		2	X								
15	1302_MW303_230322	22.03.23	W		2	X								
16	1302_MW241_230323	23.03.23	W		2	X								
17	1302_MW453_230323	23.03.23	W		2	X								
18	1302_MW240_230323	23.03.23	W		2	X								
19	1302_MW197_230323	23.03.23	W		2	X								
20	1302_MW215_230323	23.03.23	W		2									
21	1302_MW107_230323	23.03.23	W		2	X								
22	1302_MW103_230323	23.03.23	W		2	X								
23	1302_MW128_230323	23.03.23	W		2	X								
				TOTAL	24									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ES2310999

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☒ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:	
PROJECT: NT_1302_PFASOMP 23	ALS QUOTE NO.: SY/139/19 V3
ORDER NUMBER: 60612561 / 4.1**	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
[redacted]	
COC emailed to ALS? (YES / NO) EDD FORMAT (or default):	RELINQUISHED BY: [redacted] DATE/TIME: 3/04/23
[redacted]	RECEIVED BY: DATE/TIME:
	RELINQUISHED BY: DATE/TIME:
	RECEIVED BY: [redacted] DATE/TIME: 04/04/23 1430

FOR 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 comment:			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								
24	1302_QC101_230320	20.03.23	W		2	X								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
—	1302_QC201_230320	20.03.23	W		2	X								
25	1302_MW209_230320	20.03.23	W		2	X								please send to NMI SYDNEY.
—	1302_MW210_230320	20.03.23	W		2	X								
27	1302_MW185_230320	20.03.23	W		2	X								
28	1302_MW191_230320	20.03.23	W		2	X								
29	1302_MW190_230320	20.03.23	W		2	X								
30	1302_MW195_230320	20.03.23	W		2	X								
31	1302_MW194_230320	20.03.23	W		2	X								
32	1302_MW454_230322	22.03.23	W		2	X								
33	1302_QC102_230322	22.03.23	W		2	X								
—	1302_QC202_230322	22.03.23	W		2	X								
				TOTAL	24									please send to NMI SYDNEY.

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ES2310995

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

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NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

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WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	❋ Standard TAT (List due date):
OFFICE:		☐ Non Standard or urgent TAT (List due date):
PROJECT: NT_1302_PFASOMP 23	ALS QUOTE NO.: SY/139/19 V3	
ORDER NUMBER: 60612561 / 4.1**		

COC SEQUENCE NUMBER (Circle)

COC: 1 2 3 4 5 6 7

OF: 1 2 3 4 5 6 7

FOR 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 comment:			

[redacted]

COC emailed to ALS? (YES / NO) EDD FORMAT (or default):

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
[redacted]			[redacted]
DATE/TIME: 3/04/23	DATE/TIME:	DATE/TIME:	DATE/TIME: 04/04/23 1430

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
34	1302_MW451_230323	23.03.23	W		2	X								
35	1302_MW148_230323	23.03.23	W		2	X								
36	1302_MW452_230323	23.03.23	W		2	X								
37	1302_QC300_230320	20.03.23	W		2	X								
38	1302_QC400_230320	20.03.23	W		2	X								
39	1302_QC301_230322	22.03.23	W		2	X								
40	1302_QC401_230322	22.03.23	W		2	X								
41	1302_QC302_230323	23.03.23	W		2	X								
42	1302_QC402_230323	23.03.23	W		2	X								
43	1302_QC500_230323	23.03.23	W		2	X								
44	1302_QC303_230314	14.03.23	W		2	X								
45	1302_QC403_230314	14.03.23	W		2	X								
				TOTAL	27									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ES2310999

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

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WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : ☒ Standard TAT (List due date):
OFFICE: Darwin	(Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):
PROJECT: NT_1302_PFASOMP 23	ALS QUOTE NO.: SY/139/19 V3
ORDER NUMBER: 60612561 / 4.1**	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
[redacted]	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):
[redacted]	

FOR 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 comment:			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
[redacted]	[redacted]		[redacted]
DATE/TIME: 20.04.23	DATE/TIME: 20 APR 2023 0900	DATE/TIME:	DATE/TIME: 21/4/23 0830

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								
01	1302_MW144_230420	20.04.23	W		2	X								
02	1302_QC100_230420	20.04.23	W		2	X								
—	1302_QC200_230420	20.04.23	W		2	X								please send to NMI SYDNEY
03	1302_QC500_230420	20.04.23	W		1	X								
				TOTAL	7									

Subcon / Forward Lab / Split WO
Lab / Analysis: NMI
Organised By / Date:
Relinquished By / Date:
Connote / Courier: QC FWD
WO No: ES2312996
Attach By PO / Internal Sheet:

Environmental Division Sydney
Work Order Reference
ES2312996

Telephone : [redacted]

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass U… …d Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bo… …P = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Environmental

ALS Laboratory: please tick →

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OFFICE: Darwin		Custody Seal Intact? Yes No N/A
PROJECT: NT_1302_PFASOMP_23	ALS QUOTE NO.: SY/139/19 V3	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: 60612561 / 4.1	COC SEQUENCE NUMBER (Circle) COC: (1) 2 3 4 5 6 7 OF: (1) 2 [redacted] 5 6 7	Random Sample Temperature on Receipt: °C
[redacted]		Other comm[redacted]
COC emailed to ALS? (YES / (NO) EDD FORMAT (or default):	RELINQUISHED BY: [redacted]	RECEIVED BY: [redacted]
[redacted]	DATE/TIME: 25.01.23	DATE/TIME: 25/1/23 3:00pm
	RELINQUISHED [redacted]	RECEIVED BY: [redacted]
	DATE/TIME: 25/1/23 3:00pm	DATE/TIME: 1/2/23 0830

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X	
1	1302-SW300-230125	25.1.23	W	PFAS	3	X	Extra vol for lab QC
2	1302-SW109-230125				3	X	Extra vol for lab QC
3	1302-SW312-230125				2	X	
4	1302-SW170-230125				2	X	
5	1302-QC100-230125				2	X	
~~6~~	1302-QC200-230125	—		—	2	X	PLS FWD TO NMI SYD
7	1302-QC300-230125				2	X	
8	1302-QC400-230125				2	X	
9	1302-QCS00-230125				2	X	
					TOTAL		

Subcon / Forward Lab SPM WO

Lab / Analysis: NMI Sydney

Organised By / Date: QC200

Relinquished By / Date:

Connote / Courier: QC [redacted] FWD

WO No: ES2302423

Attach By PO / Internal Sheet:

LAB OF ORIGIN: DARWIN

Environmental Division Sydney

Work Order Reference ES2302423

Telephone [redacted]

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserv Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

CHAIN OF CUSTODY

ALS Laboratory; please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
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☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 24 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
☐MUDGEE 27 Sydney Road Mudgee NSW 2850 Ph: 02 6372 6735 E: mudgee.mail@alsglobal.com
☐NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com
☐PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
☒SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	⊛ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE:		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes / No / N/A
PROJECT: NT_1302_PFASOMP 23	ALS QUOTE NO.: SY/139/19 V3	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes / No / N/A
ORDER NUMBER: 60612561 / 4.1**		COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
[redacted]		OF: 1 [redacted] 5 6 7	Other comment:

COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RELINQUISHED BY:	RECEIVED [redacted]
[redacted]		DATE/TIME: 3/04/23.	DATE/TIME: 3/4/23 12:40pm

RELINQUISHED BY:	RE[redacted]
DATE/TIME:	DATE/TIME: 04/04/23 1430

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	1302_SW132_230327	27.03.23	W		2	X								
	1302_QC100_230327	27.03.23	W		2	X								
	1302_QC200_230327	27.03.23	W		2	X								Please send to NMI SYDNEY
	1302_SW133_230327	27.03.23	W		2	X								
	1302_SW114_230327	27.03.23	W		2	X								
	1302_SW104_230327	27.03.23	W		2	X								
	1302_SW115_230327	27.03.23	W		2	X								
	1302_SW106_230327	27.03.23	W		2	X								
	1302_SW108_230327	27.03.23	W		2	X								
	1302_SW168_230327	27.03.23	W		2	X								
	1302_SW109_230327	27.03.23	W		2	X								
	1302_SW300_230327	27.03.23	W		2	X								
				TOTAL	24									

Environmental Division
Sydney
Work Order Reference
ES2311000

Telephone [redacted]

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ES2311000

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

BRISBANE 32 Shand Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

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MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com

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NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 024423 2063 E: nowra@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com

WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	❋ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE:		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: NT_1302_PFASOMP 23	ALS QUOTE NO.: SY/139/19 V3	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: 60612561 / 4.1		COC: 1 (2) 3 4 5 6 7	Random Sample Temperature on Receipt: °C
[redacted]		OF: (1) 2 3 4 5 6 7	Other comment:

COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RELINQUISHED BY: [redacted] DATE/TIME: 3/04/23	RECEIVED BY: DATE/TIME:
[redacted]		RELINQUISHED BY: DATE/TIME:	RECEIVED BY: [redacted] DATE/TIME: 04/04/23 1430

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED Including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								
	1302_SW152_230328	28.03.23	W		2	X								
	1302_SW170_230328	28.03.23	W		2	X								
	1302_SW312_230328	28.03.23	W		2	X								
	1302_SW178_230328	28.03.23	W		2	X								
	1302_QC101_230328	28.03.23	W		2	X								
	1302_QC201_230328	28.03.23	W		2	X								please send to NMI SYDNEY
	1302_SW181_230328	28.03.23	W		2	X								
	1302_SW162_230328	28.03.23	W		2	X								
	1302_SW160_230328	28.03.23	W		2	X								
	1302_SW156_230328	28.03.23	W		2	X								
	1302_SW113_230328	28.03.23	W		2	X								
	1302_SW112_230328	28.03.23	W		2	X								
				TOTAL	24									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ES2311000

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☒ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:	
PROJECT: NT_1302_PFASOMP-23	ALS QUOTE NO.: SY/139/19 V3
ORDER NUMBER: 60612561 / 4.1**	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7
[redacted]	FOR 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 comment:
COC emailed to ALS? (YES / NO) EDD FORMAT (or default): [redacted]	RECEIVED BY: DATE/TIME: 3/04/23
[redacted]	RELINQUISHED BY: DATE/TIME:
	RECEIVED BY: [redacted] DATE/TIME: 04/04/23 1430

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PREservative (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X								
	1302_QC102_230328	28.03.23	W		2	X								Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
	1302_QC202_230328	28.03.23	W		2	X								
	1302_SW120_230328	28.03.23	W		2	X								please send to NMI SYDNEY.
	1302_SW125_230328	28.03.23	W		2	X								
	1302_SW143_230328	28.03.23	W		2	X								
	1302_SW124_230328	28.03.23	W		2	X								
	1302_QC300_230327	27.03.23	W		2	X								
	1302_QC400_230327	27.03.23	W		2	X								
	1302_QC301_230328	28.03.23	W		2	X								
	1302_QC401_230328	28.03.23	W		2	X								
	1302_QC500_230328	28.03.23	W		2	X								
				TOTAL	22									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic; V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

ES2311000

CHAIN OF CUSTODY

(ALS) COC#: 48854 *ALS Laboratory:* ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP_230221

SITE: NT_1302_PFASOMP_230221

ORDER NO: 60612561-4.1

[redacted]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME:	DATE TIME:	[redacted] DATE TIME: 24/2/23 0830

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: 6.3 °C

Other comments:

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	NT_1302_SW109 _230221		23/02/2023 10:01 AM	WATER	ALS: 2 Non ALS: 0	No	X		
002	NT_1302_SW170 _230221		21/02/2023 10:03 AM	WATER	ALS: 2 Non ALS: 0	No	X		
003	NT_1302_SW312 _230221		21/02/2023 10:04 AM	WATER	ALS: 2 Non ALS: 0	No	X		
004	NT_1302_SW300 _230221		21/02/2023 10:05 AM	WATER	ALS: 2 Non ALS: 0	No	X		
005	NT_1302_QC100_230221		21/02/2023 10:07 AM	WATER	ALS: 2 Non ALS: 0	No	X		
~~006~~	NT_1302_QC200 _230221		21/02/2023 10:09 AM	WATER	ALS: 2 Non ALS: 0	No	X	Please send to NMI Sydney for analysis	
007	NT_1302_QC300 _230221		21/02/2023 10:15 AM	WATER	ALS: 2 Non ALS: 0	No	X		
008	NT_1302_QC400 _230221		21/02/2023 10:16 AM	WATER	ALS: 2 Non ALS: 0	No	X		
009	NT_1302_QC500 _230221		21/02/2023 10:17 AM	WATER	ALS: 1 Non ALS: 0	No	X		

[redacted] Split WO

Lab / Analysis: NMI

Organised By / Date: QC 205

Relinquished By / Date:

Courier / Courier: QC PWD

WO No: ES2305982

Attach By PO / Internal Sheet:

Environmental Division
Sydney
Work Order Reference
ES2305982

Telephon[redacted]

CHAIN OF CUSTODY

ALS COC#: 48854 ALS Laboratory: ES Sydney

CLIENT: AECOMAU - AECOM AUSTRALIA PTY LTD

PROJECT: NT_1302_PFASOMP_230221

SITE: NT_1302_PFASOMP_230221

ORDER NO: 60612561-4.1

[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:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	NT_1302_SW109 _230221	HDPE (no PTFE)	20 mL	00350522041790	Grey	No	
001	NT_1302_SW109 _230221	HDPE (no PTFE)	20 mL	00350522042012	Grey	No	
002	NT_1302_SW170 _230221	HDPE (no PTFE)	20 mL	00350522041735	Grey	No	
002	NT_1302_SW170 _230221	HDPE (no PTFE)	20 mL	00350522041572	Grey	No	
003	NT_1302_SW312 _230221	HDPE (no PTFE)	20 mL	00350522041761	Grey	No	
003	NT_1302_SW312 _230221	HDPE (no PTFE)	20 mL	00350522041716	Grey	No	
004	NT_1302_SW300 _230221	HDPE (no PTFE)	20 mL	00350522041652	Grey	No	
004	NT_1302_SW300 _230221	HDPE (no PTFE)	20 mL	00350522041501	Grey	No	
005	NT_1302_QC100_230221	HDPE (no PTFE)	20 mL	00350522041854	Grey	No	
005	NT_1302_QC100_230221	HDPE (no PTFE)	20 mL	00350522041576	Grey	No	
006	NT_1302_QC200 _230221	HDPE (no PTFE)	20 mL	00350522041783	Grey	No	
006	NT_1302_QC200 _230221	HDPE (no PTFE)	20 mL	00350522041487	Grey	No	
007	NT_1302_QC300 _230221	HDPE (no PTFE)	20 mL	00350522041497	Grey	No	
007	NT_1302_QC300 _230221	HDPE (no PTFE)	20 mL	00350522041696	Grey	No	
008	NT_1302_QC400 _230221	HDPE (no PTFE)	20 mL	00350621037544	Grey	No	
008	NT_1302_QC400 _230221	HDPE (no PTFE)	20 mL	00350621037399	Grey	No	
009	NT_1302_QC500 _230221	HDPE (no PTFE)	20 mL	00350621027955	Grey	No	

Total Bottle Count: ALS: 17, Non ALS: 0

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304 Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com

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PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

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WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: AECOM	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g. Ultra Trace Organics)	⊗ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE:	ALS QUOTE NO.: SY/139/19 V3	FOR LABORATORY USE ONLY (Circle)
PROJECT: NT_1302_PFASOMP 23	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 [redacted] 5 6 7	Custody Seal Intact? Yes No N/A
ORDER NUMBER: 60612561 / 4.1**		Free Ice / frozen ice bricks present upon receipt? Yes No N/A
[redacted]		Random Sample Temperature on Receipt: °C
		Other comment:

COC emailed to ALS? (YES / NO) [redacted]	EDD FORMAT (or default):	RELINQUISHED BY: [redacted] DATE/TIME: 14.04.23	RECEIVED B [redacted] DATE/TIME: 14/4/23 2:00pm
		RELINQUISHED BY: DATE/TIME:	RECEIVED BY: DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Forward QC200s to NMI Sydney

Subcon / Forward ... split WO
Lab / Address:
Organised By / Date: QC200
Relinquished By / Date:
Connote / Courier: QC FWD
WO No: ES2312445
Attach By PO / Material Sheet:

LAB OF ORIGIN: DARWIN

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).	Additional Information
LAB ID	Sample ID: 1302_MWXXX_220XXX	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL CONTAINERS	PFAS - EP231X	
1	1302_SW170_230414	14.04.23	W		2	X	
2	1302_SW300_230414	14.04.23	W		2	X	
3	1302_SW312_230414	14.04.23	W		2	X	
4	1302_SW109_230414	14.04.23	W		2	X	
5	1302_QC100_230414	14.04.23	W		2	X	
6	1302_QC200_230414	14.04.23	W		2	X	Please send to NMI SYDNEY
7	1302_QC300_230414	14.04.23	W		2	X	
8	1302_QC400_230414	14.04.23	W		2	X	
9	1302_QC500_230414	14.04.23	W		2	X	
				TOTAL	18		

Environmental Division Sydney
Work Order Reference
ES2312445

Telephone : [redacted]

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Appendix F

Lab Reports

D R A F T

Appendix F Lab Reports

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2240147**

Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	[redacted]
	[redacted]		[redacted]
E-mail	: [redacted]	E-mail	: [redacted]
	[redacted]		
Project	: [redacted]	Page	: [redacted]
Order number	: [redacted]	Quote number	: [redacted]
C-O-C number	: ----	QC Level	: [redacted]
Site	: ----		
Sampler	: [redacted]		

Dates

Date Samples Received	: 08-Nov-2022 07:00	Issue Date	: 06-Dec-2022
Client Requested Due Date	: 19-Dec-2022	Scheduled Reporting Date	: **19-Dec-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: 4	Temperature	: 4.9°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 65 / 65

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
- This is an updated SRN to correct the project ID.
- **This Work Order (ES2240147) contains BIOTA samples, the water samples were SPLIT into Work Order ES2240280.**
- **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 direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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.

Method / Sample ID	Sample Container Received	Preferred Sample Container for Analysis
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS : EP231X		
1302_BIOAFA258_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA259_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA260_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA261_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA262_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA263_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA264_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA265_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA266_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA267_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA268_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA269_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA270_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA271_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA272_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA273_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA274_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA275_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA276_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA277_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA278_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA279_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA280_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA281_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA282_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA283_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA284_221029	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA285_221029	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA286_221029	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA287_221029	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA288_221029	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA289_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA290_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA291_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA292_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA293_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA294_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA295_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA296_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA297_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA298_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA299_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA300_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA301_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA302_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA303_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA304_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA305_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA306_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA307_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA308_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA309_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA310_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA311_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA312_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA313_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA314_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC140_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC141_221025	- Snap Lock Bag - frozen	- Frozen Sample

Method *Sample ID*	Sample Container Received	Preferred Sample Container for Analysis
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS : EP231X		
1302_QC142_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC143_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC144_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC145_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC146_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC147_221026	- Snap Lock Bag - frozen	- Frozen Sample
PFOS - Linear/Branched Speciation : EP231-PFOS-SP		
1302_BIOAFA258_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA259_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA260_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA261_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA262_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA263_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA264_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA265_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA266_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA267_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA268_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA269_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA270_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA271_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA272_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA273_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA274_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA275_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA276_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA277_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA278_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA279_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA280_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA281_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA282_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA283_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA284_221029	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA285_221029	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA286_221029	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA287_221029	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA288_221029	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA289_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA290_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA291_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA292_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA293_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA294_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA295_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA296_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA297_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA298_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA299_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA300_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA301_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA302_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA303_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA304_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA305_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA306_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA307_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA308_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA309_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA310_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA311_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA312_221031	- Snap Lock Bag - frozen	- Frozen Sample

Method Sample ID	Sample Container Received	Preferred Sample Container for Analysis
PFOS - Linear/Branched Speciation : EP231-PFOS-SP		
1302_BIOAFA313_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_BIOAFA314_221031	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC140_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC141_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC142_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC143_221025	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC144_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC145_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC146_221026	- Snap Lock Bag - frozen	- Frozen Sample
1302_QC147_221026	- Snap Lock Bag - frozen	- Frozen Sample

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

ES2240147-001	[25-Oct-2022]	1302_BIOAFA258_221025
ES2240147-002	[25-Oct-2022]	1302_BIOAFA259_221025
ES2240147-003	[25-Oct-2022]	1302_BIOAFA260_221025
ES2240147-004	[25-Oct-2022]	1302_BIOAFA261_221025
ES2240147-005	[25-Oct-2022]	1302_BIOAFA262_221025
ES2240147-006	[25-Oct-2022]	1302_BIOAFA263_221025
ES2240147-007	[25-Oct-2022]	1302_BIOAFA264_221025
ES2240147-008	[25-Oct-2022]	1302_BIOAFA265_221025
ES2240147-009	[25-Oct-2022]	1302_BIOAFA266_221025
ES2240147-010	[25-Oct-2022]	1302_BIOAFA267_221025
ES2240147-011	[25-Oct-2022]	1302_BIOAFA268_221025
ES2240147-012	[25-Oct-2022]	1302_BIOAFA269_221025
ES2240147-013	[25-Oct-2022]	1302_BIOAFA270_221025
ES2240147-014	[25-Oct-2022]	1302_BIOAFA271_221025
ES2240147-015	[25-Oct-2022]	1302_BIOAFA272_221025
ES2240147-016	[25-Oct-2022]	1302_BIOAFA273_221025
ES2240147-017	[25-Oct-2022]	1302_BIOAFA274_221025
ES2240147-018	[25-Oct-2022]	1302_BIOAFA275_221025
ES2240147-019	[25-Oct-2022]	1302_BIOAFA276_221025
ES2240147-020	[25-Oct-2022]	1302_BIOAFA277_221025
ES2240147-021	[25-Oct-2022]	1302_BIOAFA278_221025
ES2240147-022	[25-Oct-2022]	1302_BIOAFA279_221025
ES2240147-023	[25-Oct-2022]	1302_BIOAFA280_221025
ES2240147-024	[25-Oct-2022]	1302_BIOAFA281_221025
ES2240147-025	[25-Oct-2022]	1302_BIOAFA282_221025
ES2240147-026	[25-Oct-2022]	1302_BIOAFA283_221025
ES2240147-027	[29-Oct-2022]	1302_BIOAFA284_221029
ES2240147-028	[29-Oct-2022]	1302_BIOAFA285_221029
ES2240147-029	[29-Oct-2022]	1302_BIOAFA286_221029
ES2240147-030	[29-Oct-2022]	1302_BIOAFA287_221029
ES2240147-031	[29-Oct-2022]	1302_BIOAFA288_221029
ES2240147-032	[26-Oct-2022]	1302_BIOAFA289_221026
ES2240147-033	[26-Oct-2022]	1302_BIOAFA290_221026
ES2240147-034	[26-Oct-2022]	1302_BIOAFA291_221026
ES2240147-035	[26-Oct-2022]	1302_BIOAFA292_221026
ES2240147-036	[26-Oct-2022]	1302_BIOAFA293_221026
ES2240147-037	[26-Oct-2022]	1302_BIOAFA294_221026
ES2240147-038	[26-Oct-2022]	1302_BIOAFA295_221026
ES2240147-039	[26-Oct-2022]	1302_BIOAFA296_221026
ES2240147-040	[26-Oct-2022]	1302_BIOAFA297_221026
ES2240147-041	[26-Oct-2022]	1302_BIOAFA298_221026
ES2240147-042	[26-Oct-2022]	1302_BIOAFA299_221026
ES2240147-043	[26-Oct-2022]	1302_BIOAFA300_221026
ES2240147-044	[26-Oct-2022]	1302_BIOAFA301_221026
ES2240147-045	[26-Oct-2022]	1302_BIOAFA302_221026
ES2240147-046	[26-Oct-2022]	1302_BIOAFA303_221026
ES2240147-047	[26-Oct-2022]	1302_BIOAFA304_221026

ES2240147-048	: [26-Oct-2022]	: 1302_BIOAFA305_221026
ES2240147-049	: [31-Oct-2022]	: 1302_BIOAFA306_221031
ES2240147-050	: [31-Oct-2022]	: 1302_BIOAFA307_221031
ES2240147-051	: [31-Oct-2022]	: 1302_BIOAFA308_221031
ES2240147-052	: [31-Oct-2022]	: 1302_BIOAFA309_221031
ES2240147-053	: [31-Oct-2022]	: 1302_BIOAFA310_221031
ES2240147-054	: [31-Oct-2022]	: 1302_BIOAFA311_221031
ES2240147-055	: [31-Oct-2022]	: 1302_BIOAFA312_221031
ES2240147-056	: [31-Oct-2022]	: 1302_BIOAFA313_221031
ES2240147-057	: [31-Oct-2022]	: 1302_BIOAFA314_221031

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: **BIOTA**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	BIOTA - EP231X PFAS - Full Suite (28 analytes) - includes PFOS
ES2240147-001	25-Oct-2022 00:00	1302_BIOAFA258_221025	✓
ES2240147-002	25-Oct-2022 00:00	1302_BIOAFA259_221025	✓
ES2240147-003	25-Oct-2022 00:00	1302_BIOAFA260_221025	✓
ES2240147-004	25-Oct-2022 00:00	1302_BIOAFA261_221025	✓
ES2240147-005	25-Oct-2022 00:00	1302_BIOAFA262_221025	✓
ES2240147-006	25-Oct-2022 00:00	1302_BIOAFA263_221025	✓
ES2240147-007	25-Oct-2022 00:00	1302_BIOAFA264_221025	✓
ES2240147-008	25-Oct-2022 00:00	1302_BIOAFA265_221025	✓
ES2240147-009	25-Oct-2022 00:00	1302_BIOAFA266_221025	✓
ES2240147-010	25-Oct-2022 00:00	1302_BIOAFA267_221025	✓
ES2240147-011	25-Oct-2022 00:00	1302_BIOAFA268_221025	✓
ES2240147-012	25-Oct-2022 00:00	1302_BIOAFA269_221025	✓
ES2240147-013	25-Oct-2022 00:00	1302_BIOAFA270_221025	✓
ES2240147-014	25-Oct-2022 00:00	1302_BIOAFA271_221025	✓
ES2240147-015	25-Oct-2022 00:00	1302_BIOAFA272_221025	✓
ES2240147-016	25-Oct-2022 00:00	1302_BIOAFA273_221025	✓
ES2240147-017	25-Oct-2022 00:00	1302_BIOAFA274_221025	✓
ES2240147-018	25-Oct-2022 00:00	1302_BIOAFA275_221025	✓
ES2240147-019	25-Oct-2022 00:00	1302_BIOAFA276_221025	✓
ES2240147-020	25-Oct-2022 00:00	1302_BIOAFA277_221025	✓
ES2240147-021	25-Oct-2022 00:00	1302_BIOAFA278_221025	✓
ES2240147-022	25-Oct-2022 00:00	1302_BIOAFA279_221025	✓
ES2240147-023	25-Oct-2022 00:00	1302_BIOAFA280_221025	✓
ES2240147-024	25-Oct-2022 00:00	1302_BIOAFA281_221025	✓
ES2240147-025	25-Oct-2022 00:00	1302_BIOAFA282_221025	✓
ES2240147-026	25-Oct-2022 00:00	1302_BIOAFA283_221025	✓
ES2240147-027	29-Oct-2022 00:00	1302_BIOAFA284_221029	✓
ES2240147-028	29-Oct-2022 00:00	1302_BIOAFA285_221029	✓
ES2240147-029	29-Oct-2022 00:00	1302_BIOAFA286_221029	✓
ES2240147-030	29-Oct-2022 00:00	1302_BIOAFA287_221029	✓
ES2240147-031	29-Oct-2022 00:00	1302_BIOAFA288_221029	✓

			BIOTA - EP231X PFAS - Full Suite (28 analytes) - includes PFOS
ES2240147-032	26-Oct-2022 00:00	1302_BIOAFA289_221026	✓
ES2240147-033	26-Oct-2022 00:00	1302_BIOAFA290_221026	✓
ES2240147-034	26-Oct-2022 00:00	1302_BIOAFA291_221026	✓
ES2240147-035	26-Oct-2022 00:00	1302_BIOAFA292_221026	✓
ES2240147-036	26-Oct-2022 00:00	1302_BIOAFA293_221026	✓
ES2240147-037	26-Oct-2022 00:00	1302_BIOAFA294_221026	✓
ES2240147-038	26-Oct-2022 00:00	1302_BIOAFA295_221026	✓
ES2240147-039	26-Oct-2022 00:00	1302_BIOAFA296_221026	✓
ES2240147-040	26-Oct-2022 00:00	1302_BIOAFA297_221026	✓
ES2240147-041	26-Oct-2022 00:00	1302_BIOAFA298_221026	✓
ES2240147-042	26-Oct-2022 00:00	1302_BIOAFA299_221026	✓
ES2240147-043	26-Oct-2022 00:00	1302_BIOAFA300_221026	✓
ES2240147-044	26-Oct-2022 00:00	1302_BIOAFA301_221026	✓
ES2240147-045	26-Oct-2022 00:00	1302_BIOAFA302_221026	✓
ES2240147-046	26-Oct-2022 00:00	1302_BIOAFA303_221026	✓
ES2240147-047	26-Oct-2022 00:00	1302_BIOAFA304_221026	✓
ES2240147-048	26-Oct-2022 00:00	1302_BIOAFA305_221026	✓
ES2240147-049	31-Oct-2022 00:00	1302_BIOAFA306_221031	✓
ES2240147-050	31-Oct-2022 00:00	1302_BIOAFA307_221031	✓
ES2240147-051	31-Oct-2022 00:00	1302_BIOAFA308_221031	✓
ES2240147-052	31-Oct-2022 00:00	1302_BIOAFA309_221031	✓
ES2240147-053	31-Oct-2022 00:00	1302_BIOAFA310_221031	✓
ES2240147-054	31-Oct-2022 00:00	1302_BIOAFA311_221031	✓
ES2240147-055	31-Oct-2022 00:00	1302_BIOAFA312_221031	✓
ES2240147-056	31-Oct-2022 00:00	1302_BIOAFA313_221031	✓
ES2240147-057	31-Oct-2022 00:00	1302_BIOAFA314_221031	✓
ES2240147-059	25-Oct-2022 00:00	1302_QC140_221025	✓
ES2240147-060	25-Oct-2022 00:00	1302_QC141_221025	✓
ES2240147-061	25-Oct-2022 00:00	1302_QC142_221025	✓
ES2240147-062	25-Oct-2022 00:00	1302_QC143_221025	✓
ES2240147-063	26-Oct-2022 00:00	1302_QC144_221026	✓
ES2240147-064	26-Oct-2022 00:00	1302_QC145_221026	✓
ES2240147-065	26-Oct-2022 00:00	1302_QC146_221026	✓
ES2240147-066	26-Oct-2022 00:00	1302_QC147_221026	✓

Proactive Holding Time Report

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

Requested Deliverables

Accounts payable

- *[redacted]

[redacted]com

[redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2240147**	Page	: 1 of 29
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: E[redacted]
[redacted]			
Telephone	: ----	Telephone	: +[redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 08-Nov-2022 07:00
Order number	: [redacted]	Date Analysis Commenced	: 29-Nov-2022
C-O-C number	: ----	Issue Date	: 19-Dec-2022 11:50
Sampler	: [redacted]		
Site	: ----		
Quote number	: [redacted]		
No. of samples received	: 65		
No. of samples analysed	: 65		

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*
[redacted]	[redacted]	[redacted]

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 (Biota): ALS NATA accreditation for PFAS in Biota covers all Perfluoroalkyl Sulfonic Acids, Perfluoroalkyl Carboxylic Acids and (n:2) Fluorotelomer Sulfonic Acids in fish (whole and muscle), plants and vegetable matrices, with the exception PFBA (fish only), EtFOSA, MeFOSE, EtFOSE, MeFOSAA, EtFOSAA.
- 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: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA258_221025	1302_BIOAFA259_221025	1302_BIOAFA260_221025	1302_BIOAFA261_221025	1302_BIOAFA262_221025
				Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
					ES2240147-001	ES2240147-002	ES2240147-003	ES2240147-004	ES2240147-005
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø **Sample Description**	----	-	--		**fillet**	**fillet**	**fillet**	**fillet**	**fillet**
ø **Weight of Sample Prepared**	----	0.1	g		**116**	**95.1**	**109**	**100**	**107**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA258_221025	1302_BIOAFA259_221025	1302_BIOAFA260_221025	1302_BIOAFA261_221025	1302_BIOAFA262_221025
				Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
					ES2240147-001	ES2240147-002	ES2240147-003	ES2240147-004	ES2240147-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	<1	<1	<1	<1
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**95.5**	**87.5**	**95.0**	**93.0**	**87.0**
13C8-PFOA	----	1	%		**98.0**	**99.5**	**95.5**	**100**	**101**

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA263_221025	1302_BIOAFA264_221025	1302_BIOAFA265_221025	1302_BIOAFA266_221025	1302_BIOAFA267_221025
				Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
					ES2240147-006	ES2240147-007	ES2240147-008	ES2240147-009	ES2240147-010
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø **Sample Description**	----	-	--		**fillet**	**fillet**	**fillet**	**fillet**	**fillet**
ø **Weight of Sample Prepared**	----	0.1	g		**110**	**60.2**	**57.5**	**41.4**	**43.2**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA263_221025	1302_BIOAFA264_221025	1302_BIOAFA265_221025	1302_BIOAFA266_221025	1302_BIOAFA267_221025
			Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	ES2240147-006	ES2240147-007	ES2240147-008	ES2240147-009	ES2240147-010
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg	<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg	<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	<2	<2	<2
EP231P: PFAS Sums								
^ Sum of PFAS	----	1	µg/kg	<1	<1	<1	<1	<1
EP231S: PFAS Surrogate								
13C4-PFOS	----	1	%	**86.5**	**87.5**	**103**	**98.0**	**95.0**
13C8-PFOA	----	1	%	**98.0**	**99.5**	**104**	**97.0**	**99.5**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA268_221025	1302_BIOAFA269_221025	1302_BIOAFA270_221025	1302_BIOAFA271_221025	1302_BIOAFA272_221025
			Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	ES2240147-011	ES2240147-012	ES2240147-013	ES2240147-014	ES2240147-015
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	fillet	fillet	fillet	fillet	fillet
ø Weight of Sample Prepared	----	0.1	g	45.2	74.9	65.0	64.9	90.2
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	1	2	1	2	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	<1	1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	1	2	2	2	<1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA268_221025	1302_BIOAFA269_221025	1302_BIOAFA270_221025	1302_BIOAFA271_221025	1302_BIOAFA272_221025
				Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		ES2240147-011	ES2240147-012	ES2240147-013	ES2240147-014	ES2240147-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**1**	**2**	**2**	**2**	<1
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**90.0**	**109**	**95.5**	**88.5**	**112**
13C8-PFOA	----	1	%		**98.0**	**100**	**98.5**	**102**	**102**

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA273_221025	1302_BIOAFA274_221025	1302_BIOAFA275_221025	1302_BIOAFA276_221025	1302_BIOAFA277_221025
				Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
					ES2240147-016	ES2240147-017	ES2240147-018	ES2240147-019	ES2240147-020
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø Sample Description	----	-	--		fish	fish	fish	fillet	fillet
ø Weight of Sample Prepared	----	0.1	g		70.3	50.5	40.6	20.9	21.8
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	<1	1	2
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		12	3	<1	1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		35	5	2	1	1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		47	8	2	2	1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA273_221025	1302_BIOAFA274_221025	1302_BIOAFA275_221025	1302_BIOAFA276_221025	1302_BIOAFA277_221025
			Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	ES2240147-016	ES2240147-017	ES2240147-018	ES2240147-019	ES2240147-020
				Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg	<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg	<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	<2	<2	<2
EP231P: PFAS Sums								
^ Sum of PFAS	----	1	µg/kg	**47**	**8**	**2**	**4**	**3**
EP231S: PFAS Surrogate								
13C4-PFOS	----	1	%	**91.0**	**104**	**88.5**	**96.5**	**102**
13C8-PFOA	----	1	%	**102**	**102**	**100**	**100**	**98.5**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA278_221025	1302_BIOAFA279_221025	1302_BIOAFA280_221025	1302_BIOAFA281_221025	1302_BIOAFA282_221025
			Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	ES2240147-021	ES2240147-022	ES2240147-023	ES2240147-024	ES2240147-025
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	Fish fillet	Fish fillet	Fish fillet	Fish fillet	Fish fillet
ø Weight of Sample Prepared	----	0.1	g	36.4	52.5	40.4	33.4	35.6
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA278_221025	1302_BIOAFA279_221025	1302_BIOAFA280_221025	1302_BIOAFA281_221025	1302_BIOAFA282_221025
				Sampling date / time	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		ES2240147-021	ES2240147-022	ES2240147-023	ES2240147-024	ES2240147-025
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	<1	<1	<1	<1
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**96.5**	**74.5**	**89.5**	**78.0**	**89.0**
13C8-PFOA	----	1	%		**98.5**	**93.0**	**91.0**	**98.5**	**96.5**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA283_221025	1302_BIOAFA284_221029	1302_BIOAFA285_221029	1302_BIOAFA286_221029	1302_BIOAFA287_221029
			Sampling date / time	25-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	ES2240147-026	ES2240147-027	ES2240147-028	ES2240147-029	ES2240147-030
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	Fish fillet	Small fish	fish organ	fish organ	fish organ
ø Weight of Sample Prepared	----	0.1	g	31.1	30.1	35.0	31.5	57.9
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	<1	7	5	17	14
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	<1	1	1	2
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	7	6	18	16
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	1	1	3	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA283_221025	1302_BIOAFA284_221029	1302_BIOAFA285_221029	1302_BIOAFA286_221029	1302_BIOAFA287_221029
				Sampling date / time	25-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		ES2240147-026	ES2240147-027	ES2240147-028	ES2240147-029	ES2240147-030
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	**8**	**7**	**21**	**16**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**79.5**	**112**	**91.0**	**113**	**110**
13C8-PFOA	----	1	%		**93.5**	**100**	**103**	**102**	**104**

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA288_221029	1302_BIOAFA289_221026	1302_BIOAFA290_221026	1302_BIOAFA291_221026	1302_BIOAFA292_221026
				Sampling date / time	29-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
					ES2240147-031	ES2240147-032	ES2240147-033	ES2240147-034	ES2240147-035
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø Sample Description	----	-	--		**fish organ**	**fish fillet**	**fish fillet**	**fish fillet**	**fish fillet**
ø Weight of Sample Prepared	----	0.1	g		**60.4**	**131**	**99.8**	**116**	**99.0**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	<1	<1	**4**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		**4**	**2**	<1	**3**	**6**
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		<1	<1	<1	**1**	**1**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		**4**	**2**	<1	**4**	**7**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA288_221029	1302_BIOAFA289_221026	1302_BIOAFA290_221026	1302_BIOAFA291_221026	1302_BIOAFA292_221026
				Sampling date / time	29-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		ES2240147-031	ES2240147-032	ES2240147-033	ES2240147-034	ES2240147-035
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**4**	**2**	<1	**4**	**11**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**95.0**	**79.5**	**102**	**104**	**116**
13C8-PFOA	----	1	%		**103**	**100**	**102**	**102**	**100**

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA293_221026	1302_BIOAFA294_221026	1302_BIOAFA295_221026	1302_BIOAFA296_221026	1302_BIOAFA297_221026
				Sampling date / time	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
					ES2240147-036	ES2240147-037	ES2240147-038	ES2240147-039	ES2240147-040
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø Sample Description	----	-	--		**fish fillet**	**fish fillet**	**fish fillet**	**fish fillet**	**fish fillet**
ø Weight of Sample Prepared	----	0.1	g		**69.3**	**56.8**	**102**	**58.2**	**54.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		**2**	**2**	<1	<1	**1**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		**2**	**2**	<1	**28**	**32**
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		<1	**1**	<1	**2**	**3**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		**2**	**3**	<1	**30**	**35**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA293_221026	1302_BIOAFA294_221026	1302_BIOAFA295_221026	1302_BIOAFA296_221026	1302_BIOAFA297_221026
				Sampling date / time	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		ES2240147-036	ES2240147-037	ES2240147-038	ES2240147-039	ES2240147-040
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**4**	**5**	<1	**30**	**36**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**98.0**	**96.0**	**95.0**	**113**	**92.5**
13C8-PFOA	----	1	%		**102**	**99.0**	**99.0**	**104**	**95.5**

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA298_221026	1302_BIOAFA299_221026	1302_BIOAFA300_221026	1302_BIOAFA301_221026	1302_BIOAFA302_221026
				Sampling date / time	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
					ES2240147-041	ES2240147-042	ES2240147-043	ES2240147-044	ES2240147-045
					Result	Result	Result	Result	Result
Biota Sample Pre-Preparation									
ø Sample Description	----	-	--		fillet	fillet	fillet	fillet	small fish
ø Weight of Sample Prepared	----	0.1	g		40.2	41.6	62.9	94.8	13.6
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg		<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg		1	<1	<1	<1	5
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg		1	<1	1	<1	4
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg		2	<1	1	<1	9
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg		<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg		<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg		<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg		<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg		<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg		<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg		<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg		<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg		<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: **BIOTA**
(Matrix: **BIOTA**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_BIOAFA298_221026	1302_BIOAFA299_221026	1302_BIOAFA300_221026	1302_BIOAFA301_221026	1302_BIOAFA302_221026
				Sampling date / time	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
					ES2240147-041	ES2240147-042	ES2240147-043	ES2240147-044	ES2240147-045
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**2**	<1	**1**	<1	**9**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**96.0**	**99.0**	**98.5**	**111**	**110**
13C8-PFOA	----	1	%		**104**	**102**	**101**	**100**	**102**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA303_221026	1302_BIOAFA304_221026	1302_BIOAFA305_221026	1302_BIOAFA306_221031	1302_BIOAFA307_221031
			Sampling date / time	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	31-Oct-2022 00:00	31-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	ES2240147-046	ES2240147-047	ES2240147-048	ES2240147-049	ES2240147-050
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	small fish	small fish	fillet	tiger prawn	tiger prawn
ø Weight of Sample Prepared	----	0.1	g	11.4	7.4	68.2	15.2	15.8
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	1	1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	18	24
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	1	2
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	1	1	<1	24	93
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	1	1	<1	7	22
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	2	2	<1	31	115
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	2	1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	2	2
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA303_221026	1302_BIOAFA304_221026	1302_BIOAFA305_221026	1302_BIOAFA306_221031	1302_BIOAFA307_221031
				Sampling date / time	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	31-Oct-2022 00:00	31-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		ES2240147-046	ES2240147-047	ES2240147-048	ES2240147-049	ES2240147-050
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**2**	**2**	<1	**55**	**145**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**110**	**81.0**	**99.0**	**104**	**99.0**
13C8-PFOA	----	1	%		**108**	**103**	**108**	**102**	**104**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA308_221031	1302_BIOAFA309_221031	1302_BIOAFA310_221031	1302_BIOAFA311_221031	1302_BIOAFA312_221031
			Sampling date / time	31-Oct-2022 00:00	31-Oct-2022 00:00	31-Oct-2022 00:00	31-Oct-2022 00:00	31-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	ES2240147-051	ES2240147-052	ES2240147-053	ES2240147-054	ES2240147-055
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	tiger prawn	tiger prawn	tiger prawn	tiger prawn	tiger prawn
ø Weight of Sample Prepared	----	0.1	g	6.7	3.2	2.6	1.6	11.5
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	9	7	12	12	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	9	22	46	30	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	1	4	20	8	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	10	26	66	38	<1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA308_221031	1302_BIOAFA309_221031	1302_BIOAFA310_221031	1302_BIOAFA311_221031	1302_BIOAFA312_221031
				Sampling date / time	31-Oct-2022 00:00	31-Oct-2022 00:00	31-Oct-2022 00:00	31-Oct-2022 00:00	31-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		ES2240147-051	ES2240147-052	ES2240147-053	ES2240147-054	ES2240147-055
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**19**	**33**	**78**	**50**	<1
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**106**	**106**	**110**	**118**	**108**
13C8-PFOA	----	1	%		**110**	**102**	**102**	**107**	**104**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_BIOAFA313_221031	1302_BIOAFA314_221031	1302_QC140_221025	1302_QC141_221025	1302_QC142_221025
			Sampling date / time	31-Oct-2022 00:00	31-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	ES2240147-056	ES2240147-057	ES2240147-059	ES2240147-060	ES2240147-061
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	tiger prawn	tiger prawn	fillet	fillet	Fillet
ø Weight of Sample Prepared	----	0.1	g	11.4	7.5	119	110	111
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	5	<1	<1	<1	<1
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	5	1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	1	1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	6	2	<1	<1	<1
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_BIOAFA313_221031	1302_BIOAFA314_221031	1302_QC140_221025	1302_QC141_221025	1302_QC142_221025
				Sampling date / time	31-Oct-2022 00:00	31-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00	25-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		ES2240147-056	ES2240147-057	ES2240147-059	ES2240147-060	ES2240147-061
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		**11**	**2**	<1	<1	<1
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**99.0**	**95.0**	**104**	**112**	**100**
13C8-PFOA	----	1	%		**98.0**	**97.5**	**102**	**104**	**106**

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)			Sample ID	1302_QC143_221025	1302_QC144_221026	1302_QC145_221026	1302_QC146_221026	1302_QC147_221026
			Sampling date / time	25-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
Compound	CAS Number	LOR	Unit	ES2240147-062	ES2240147-063	ES2240147-064	ES2240147-065	ES2240147-066
				Result	Result	Result	Result	Result
Biota Sample Pre-Preparation								
ø Sample Description	----	-	--	Fillet	Fillet	Fillet	Fillet	Fillet
ø Weight of Sample Prepared	----	0.1	g	98.9	126	95.1	106	99.9
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	<1	<1	<1
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	<1	<1	2
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctane sulfonic acid (PFOS) - Linear	2795-39-3	1	µg/kg	<1	1	<1	7	2
Perfluorooctane sulfonic acid (PFOS) - Branched	----	1	µg/kg	<1	1	<1	1	<1
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	2	<1	8	2
Perfluorodecane sulfonic acid (PFDS)	335-77-3	2	µg/kg	<2	<2	<2	<2	<2
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	<5	<5	<5
Perfluoropentanoic acid (PFPeA)	2706-90-3	2	µg/kg	<2	<2	<2	<2	<2
Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	<1	<1	<1
Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	<1	<1	<1
Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	<1	<1	<1
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	<1	<1	<1
Perfluorododecanoic acid (PFDoDA)	307-55-1	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	2	µg/kg	<2	<2	<2	<2	<2
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	<2	<2	<2

Analytical Results

Sub-Matrix: BIOTA (Matrix: BIOTA)				Sample ID	1302_QC143_221025	1302_QC144_221026	1302_QC145_221026	1302_QC146_221026	1302_QC147_221026
				Sampling date / time	25-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00	26-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		ES2240147-062	ES2240147-063	ES2240147-064	ES2240147-065	ES2240147-066
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	5	µg/kg		<5	<5	<5	<5	<5
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	5	µg/kg		<5	<5	<5	<5	<5
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg		<2	<2	<2	<2	<2
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg		<2	<2	<2	<2	<2
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg		<1	<1	<1	<1	<1
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg		<1	<1	<1	<1	<1
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg		<2	<2	<2	<2	<2
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg		<2	<2	<2	<2	<2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg		<2	<2	<2	<2	<2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg		<2	<2	<2	<2	<2
EP231P: PFAS Sums									
^ Sum of PFAS	----	1	µg/kg		<1	**2**	<1	**8**	**4**
EP231S: PFAS Surrogate									
13C4-PFOS	----	1	%		**116**	**112**	**115**	**116**	**106**
13C8-PFOA	----	1	%		**104**	**110**	**108**	**102**	**110**

Surrogate Control Limits

Sub-Matrix: **BIOTA**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	50	130
13C8-PFOA	----	50	130

ALS Environmental

CERTIFICATE OF ANALYSIS

[redacted]

Client		Laboratory	
Contact		Contact	
Address		Address	
Telephone		Telephone	
Project		Date Samples Received	: 08-Nov-2022 07:00
Order number		Date Analysis Commenced	: 29-Nov-2022
C-O-C number		Issue Date	: 05-Dec-2022 08:53
Sampler			
Site			
Quote number			
No. of samples received	: 9		
No. of samples analysed	: 9		

[redacted]

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*
[redacted]		

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.
- 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: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_QC139_221025	1302_QC304_221031	1302_QC504_221024	1302_SW019_221025	1302_SW020_221026
				Sampling date / time	25-Oct-2022 00:00	31-Oct-2022 00:00	24-Oct-2022 00:00	25-Oct-2022 00:00	26-Oct-2022 00:00
					ES2240280-001	ES2240280-002	ES2240280-003	ES2240280-004	ES2240280-005
					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	**0.04**
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	**0.05**
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: WATER (Matrix: WATER)				Sample ID	1302_QC139_221025	1302_QC304_221031	1302_QC504_221024	1302_SW019_221025	1302_SW020_221026
				Sampling date / time	25-Oct-2022 00:00	31-Oct-2022 00:00	24-Oct-2022 00:00	25-Oct-2022 00:00	26-Oct-2022 00:00
Compound	CAS Number	LOR	Unit		ES2240280-001	ES2240280-002	ES2240280-003	ES2240280-004	ES2240280-005
					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	**0.09**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.09**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.09**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	**100**	**101**	**97.5**	**92.9**
13C8-PFOA	----	0.02	%		**98.8**	**96.4**	**97.8**	**99.8**	**100**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW021_221029	1302_SW022_221029	1302_SW023_221029	1302_SW024_221029	----
				Sampling date / time	29-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00	----
Compound	CAS Number	LOR	Unit		ES2240280-006	ES2240280-007	ES2240280-008	ES2240280-009	--------
					Result	Result	Result	Result	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.05**	**0.02**	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.07**	**0.03**	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.16**	**0.50**	**0.24**	**0.13**	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.03**	<0.02	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.27**	**0.80**	**0.41**	**0.20**	----
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**	**0.08**	**0.04**	**0.02**	----
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	**0.03**	**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	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW021_221029	1302_SW022_221029	1302_SW023_221029	1302_SW024_221029	----
				Sampling date / time	29-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00	29-Oct-2022 00:00	----
Compound	CAS Number	LOR	Unit		ES2240280-006	ES2240280-007	ES2240280-008	ES2240280-009	--------
					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	----
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	----
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		**0.45**	**1.56**	**0.75**	**0.35**	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.43**	**1.30**	**0.65**	**0.33**	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.45**	**1.46**	**0.72**	**0.35**	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.3**	**99.3**	**100**	**99.6**	----
13C8-PFOA	----	0.02	%		**95.3**	**104**	**98.2**	**103**	----

Surrogate Control Limits

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

Environmental

LITY CONTROL REPOR

[redacted]

Client		Laboratory	
Contact		Contact	
Address		Address	
Telephone		Telephone	
Project		Date Samples Received	: 08-Nov-2022
Order number		Date Analysis Commenced	: 29-Nov-2022
C-O-C number		Issue Date	: 05-Dec-2022
Sampler			
Site			
Quote number			
No. of samples received	: 9		
No. of samples analysed	: 9		

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*

[redacted]

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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4731319)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	96.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	123	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	112	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	120	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	114	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	106	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4731319)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	116	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	118	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	113	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	114	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	114	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	117	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	115	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4731319)								
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	116	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	96.0	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	114	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	113	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	107	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4731319)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	118	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	117	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	120	67.0	138

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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4731319) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	112	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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	[redacted]	Page	[redacted]
Client		Laboratory	
Contact		Contact	
Address		Address	
Telephone		Telephone	
Project		Date Samples Received	: [illegible]
Order number		Date Analysis Commenced	: 29-Nov-2022
C-O-C number		Issue Date	: 19-Dec-2022
Sampler			
Site			
Quote number	: SY/139/19 V3		
No. of samples received	: 65		
No. of samples analysed	: 65		

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*
[redacted]		

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: **BIOTA**

				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: 4734089)									
ES2240147-001	1302_BIOAFA258_221025	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
ES2240147-011	1302_BIOAFA268_221025	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	1	1	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4734090)									
ES2240147-021	1302_BIOAFA278_221025	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
ES2240147-031	1302_BIOAFA288_221029	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	4	5	0.0	No Limit

Sub-Matrix: **BIOTA**

				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: 4734090) - continued									
ES2240147-031	1302_BIOAFA288_221029	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4734093)									
ES2240147-041	1302_BIOAFA298_221026	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	2	2	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
ES2240147-051	1302_BIOAFA308_221031	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	9	10	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	10	10	0.0	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4734094)									
ES2240147-061	1302_QC142_221025	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
ES2240149-005	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	1	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	9	10	12.5	0% - 50%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<2	<2	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4734089)									
ES2240147-001	1302_BIOAFA258_221025	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
ES2240147-011	1302_BIOAFA268_221025	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit

Sub-Matrix: **BIOTA**

				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: 4734089) - continued									
ES2240147-011	1302_BIOAFA268_221025	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4734090)									
ES2240147-021	1302_BIOAFA278_221025	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
ES2240147-031	1302_BIOAFA288_221029	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4734093)									
ES2240147-041	1302_BIOAFA298_221026	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit

Sub-Matrix: **BIOTA**

				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: 4734093) - continued									
ES2240147-041	1302_BIOAFA298_221026	EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
ES2240147-051	1302_BIOAFA308_221031	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	1	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4734094)									
ES2240147-061	1302_QC142_221025	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
ES2240149-005	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	<5	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4734089)									

Sub-Matrix: **BIOTA**

				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: 4734089) - continued									
ES2240147-001	1302_BIOAFA258_221025	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
ES2240147-011	1302_BIOAFA268_221025	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4734090)									
ES2240147-021	1302_BIOAFA278_221025	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
ES2240147-031	1302_BIOAFA288_221029	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit

Sub-Matrix: **BIOTA**

				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: 4734090) - continued									
ES2240147-031	1302_BIOAFA288_221029	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4734093)									
ES2240147-041	1302_BIOAFA298_221026	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
ES2240147-051	1302_BIOAFA308_221031	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4734094)									
ES2240147-061	1302_QC142_221025	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit

Sub-Matrix: **BIOTA**

				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: 4734094) - continued									
ES2240147-061	1302_QC142_221025	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
ES2240149-005	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	<1	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<5	<5	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	<2	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4734089)									
ES2240147-001	1302_BIOAFA258_221025	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit
ES2240147-011	1302_BIOAFA268_221025	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit

Sub-Matrix: **BIOTA**

				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: 4734089) - continued									
ES2240147-011	1302_BIOAFA268_221025	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4734090)									
ES2240147-021	1302_BIOAFA278_221025	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit
ES2240147-031	1302_BIOAFA288_221029	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4734093)									
ES2240147-041	1302_BIOAFA298_221026	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit
ES2240147-051	1302_BIOAFA308_221031	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4734094)									
ES2240147-061	1302_QC142_221025	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit

Sub-Matrix: **BIOTA**

				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: 4734094) - continued									
ES2240147-061	1302_QC142_221025	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit
ES2240149-005	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	<2	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	<2	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4734089)									
ES2240147-001	1302_BIOAFA258_221025	EP231X: Sum of PFAS	----	1	µg/kg	<1	<1	0.0	No Limit
ES2240147-011	1302_BIOAFA268_221025	EP231X: Sum of PFAS	----	1	µg/kg	1	1	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4734090)									
ES2240147-021	1302_BIOAFA278_221025	EP231X: Sum of PFAS	----	1	µg/kg	<1	<1	0.0	No Limit
ES2240147-031	1302_BIOAFA288_221029	EP231X: Sum of PFAS	----	1	µg/kg	4	5	22.2	No Limit
EP231P: PFAS Sums (QC Lot: 4734093)									
ES2240147-041	1302_BIOAFA298_221026	EP231X: Sum of PFAS	----	1	µg/kg	2	2	0.0	No Limit
ES2240147-051	1302_BIOAFA308_221031	EP231X: Sum of PFAS	----	1	µg/kg	19	21	10.0	0% - 20%
EP231P: PFAS Sums (QC Lot: 4734094)									
ES2240147-061	1302_QC142_221025	EP231X: Sum of PFAS	----	1	µg/kg	<1	<1	0.0	No Limit
ES2240149-005	Anonymous	EP231X: Sum of PFAS	----	1	µg/kg	9	11	20.0	0% - 50%

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: **BIOTA**

				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: 4734089)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	5 µg/kg	81.2	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	5 µg/kg	102	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	5 µg/kg	91.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	5 µg/kg	105	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	5 µg/kg	97.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<1	5 µg/kg	107	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4734090)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	5 µg/kg	80.8	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	5 µg/kg	101	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	5 µg/kg	85.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	5 µg/kg	99.6	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	5 µg/kg	87.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<1	5 µg/kg	101	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4734093)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	5 µg/kg	73.6	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	5 µg/kg	94.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	5 µg/kg	88.0	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	5 µg/kg	96.8	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	5 µg/kg	96.0	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<1	5 µg/kg	110	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4734094)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	1	µg/kg	<1	5 µg/kg	76.4	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	1	µg/kg	<1	5 µg/kg	86.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	1	µg/kg	<1	5 µg/kg	82.8	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	1	µg/kg	<1	5 µg/kg	95.2	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	1	µg/kg	<1	5 µg/kg	94.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	1	µg/kg	<1	5 µg/kg	100	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4734089)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	25 µg/kg	94.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<1	5 µg/kg	96.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	5 µg/kg	89.6	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	5 µg/kg	87.6	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	5 µg/kg	97.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	5 µg/kg	96.8	72.0	129

Sub-Matrix: **BIOTA**

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: 4734089) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	5 µg/kg	85.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	5 µg/kg	93.2	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<1	5 µg/kg	100	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<1	5 µg/kg	97.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	12.5 µg/kg	89.8	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4734090)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	25 µg/kg	99.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<1	5 µg/kg	100	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	5 µg/kg	98.8	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	5 µg/kg	90.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	5 µg/kg	94.0	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	5 µg/kg	96.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	5 µg/kg	88.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	5 µg/kg	91.6	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<1	5 µg/kg	89.6	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<1	5 µg/kg	92.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	12.5 µg/kg	101	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4734093)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	25 µg/kg	97.4	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<1	5 µg/kg	92.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	5 µg/kg	86.0	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	5 µg/kg	88.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	5 µg/kg	93.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	5 µg/kg	94.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	5 µg/kg	82.8	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	5 µg/kg	90.8	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<1	5 µg/kg	91.2	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<1	5 µg/kg	89.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	12.5 µg/kg	102	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4734094)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	5	µg/kg	<5	25 µg/kg	129	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	1	µg/kg	<1	5 µg/kg	114	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	1	µg/kg	<1	5 µg/kg	103	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	1	µg/kg	<1	5 µg/kg	93.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	1	µg/kg	<1	5 µg/kg	97.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	1	µg/kg	<1	5 µg/kg	98.4	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	1	µg/kg	<1	5 µg/kg	90.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	1	µg/kg	<1	5 µg/kg	94.4	64.0	136

Sub-Matrix: **BIOTA**

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: 4734094) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	1	µg/kg	<1	5 µg/kg	89.6	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	1	µg/kg	<1	5 µg/kg	87.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	2	µg/kg	<2	12.5 µg/kg	91.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4734089)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<1	5 µg/kg	88.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<2	12.5 µg/kg	100	88.1	105
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	12.5 µg/kg	92.8	81.6	144
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	12.5 µg/kg	110	84.7	135
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	12.5 µg/kg	96.3	20.5	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	5 µg/kg	85.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	5 µg/kg	84.8	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4734090)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<1	5 µg/kg	105	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<2	12.5 µg/kg	97.4	88.1	105
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	12.5 µg/kg	85.0	81.6	144
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	12.5 µg/kg	109	84.7	135
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	12.5 µg/kg	103	20.5	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	5 µg/kg	102	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	5 µg/kg	89.2	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4734093)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<1	5 µg/kg	87.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<2	12.5 µg/kg	93.1	88.1	105
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	12.5 µg/kg	81.8	81.6	144
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	12.5 µg/kg	98.2	84.7	135
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	12.5 µg/kg	97.3	20.5	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	5 µg/kg	88.0	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	5 µg/kg	83.6	61.0	139

Sub-Matrix: **BIOTA**

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: 4734094)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	1	µg/kg	<1	5 µg/kg	93.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	2	µg/kg	<2	12.5 µg/kg	94.4	88.1	105
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	2	µg/kg	<2	12.5 µg/kg	92.2	81.6	144
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	2	µg/kg	<2	12.5 µg/kg	98.9	84.7	135
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	2	µg/kg	<2	12.5 µg/kg	90.6	20.5	150
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	1	µg/kg	<1	5 µg/kg	92.8	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	1	µg/kg	<1	5 µg/kg	90.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4734089)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	5 µg/kg	78.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	5 µg/kg	94.0	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	5 µg/kg	107	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	5 µg/kg	108	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4734090)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	5 µg/kg	93.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	5 µg/kg	96.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	5 µg/kg	100	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	5 µg/kg	# 86.0	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4734093)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	5 µg/kg	84.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	5 µg/kg	95.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	5 µg/kg	97.2	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	5 µg/kg	95.2	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4734094)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	2	µg/kg	<2	5 µg/kg	95.6	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	2	µg/kg	<2	5 µg/kg	98.4	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	2	µg/kg	<2	5 µg/kg	103	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	2	µg/kg	<2	5 µg/kg	# 90.4	93.4	130
EP231P: PFAS Sums (QCLot: 4734089)								
EP231X: Sum of PFAS	----	1	µg/kg	<1	----	----	----	----
EP231P: PFAS Sums (QCLot: 4734090)								
EP231X: Sum of PFAS	----	1	µg/kg	<1	----	----	----	----
EP231P: PFAS Sums (QCLot: 4734093)								
EP231X: Sum of PFAS	----	1	µg/kg	<1	----	----	----	----
EP231P: PFAS Sums (QCLot: 4734094)								

Sub-Matrix: **BIOTA**

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: 4734094) - continued								
EP231X: Sum of PFAS	----	1	µg/kg	<1	----	----	----	----

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: **BIOTA**

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: 4734089)							
ES2240147-002	1302_BIOAFA259_221025	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	5 µg/kg	94.4	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	5 µg/kg	105	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	5 µg/kg	102	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	5 µg/kg	107	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	5 µg/kg	107	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	5 µg/kg	111	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4734090)							
ES2240147-022	1302_BIOAFA279_221025	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	5 µg/kg	88.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	5 µg/kg	107	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	5 µg/kg	88.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	5 µg/kg	97.2	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	5 µg/kg	90.8	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	5 µg/kg	96.0	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4734093)							
ES2240147-042	1302_BIOAFA299_221026	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	5 µg/kg	82.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	5 µg/kg	106	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	5 µg/kg	93.6	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	5 µg/kg	106	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	5 µg/kg	111	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	5 µg/kg	106	59.0	134
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4734094)							
ES2240147-062	1302_QC143_221025	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	5 µg/kg	80.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	5 µg/kg	112	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	5 µg/kg	94.0	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	5 µg/kg	106	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	5 µg/kg	92.8	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	5 µg/kg	116	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4734089)							

Sub-Matrix: **BIOTA**

				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: 4734089) - continued							
ES2240147-002	1302_BIOAFA259_221025	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	25 µg/kg	100	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	5 µg/kg	105	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	5 µg/kg	95.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	5 µg/kg	99.2	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	5 µg/kg	102	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	5 µg/kg	107	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	5 µg/kg	96.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	5 µg/kg	102	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	5 µg/kg	98.0	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	5 µg/kg	102	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	12.5 µg/kg	97.1	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4734090)							
ES2240147-022	1302_BIOAFA279_221025	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	25 µg/kg	113	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	5 µg/kg	106	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	5 µg/kg	102	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	5 µg/kg	98.0	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	5 µg/kg	101	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	5 µg/kg	98.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	5 µg/kg	96.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	5 µg/kg	89.2	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	5 µg/kg	93.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	5 µg/kg	91.6	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	12.5 µg/kg	101	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4734093)							
ES2240147-042	1302_BIOAFA299_221026	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	25 µg/kg	101	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	5 µg/kg	96.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	5 µg/kg	94.4	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	5 µg/kg	92.8	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	5 µg/kg	104	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	5 µg/kg	100	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	5 µg/kg	89.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	5 µg/kg	94.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	5 µg/kg	91.6	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	5 µg/kg	94.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	12.5 µg/kg	109	69.0	133
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4734094)							
ES2240147-062	1302_QC143_221025	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	25 µg/kg	101	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	5 µg/kg	105	69.0	132

Sub-Matrix: **BIOTA**

				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: 4734094) - continued							
ES2240147-062	1302_QC143_221025	EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	5 µg/kg	105	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	5 µg/kg	94.8	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	5 µg/kg	99.2	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	5 µg/kg	105	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	5 µg/kg	101	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	5 µg/kg	110	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	5 µg/kg	96.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	5 µg/kg	103	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	12.5 µg/kg	101	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4734089)							
ES2240147-002	1302_BIOAFA259_221025	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	5 µg/kg	97.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	12.5 µg/kg	97.4	88.1	105
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	12.5 µg/kg	97.9	81.6	144
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	12.5 µg/kg	106	84.7	135
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	12.5 µg/kg	101	20.5	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	5 µg/kg	105	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	5 µg/kg	101	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4734090)							
ES2240147-022	1302_BIOAFA279_221025	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	5 µg/kg	98.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	12.5 µg/kg	103	88.1	105
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	12.5 µg/kg	89.8	81.6	144
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	12.5 µg/kg	110	84.7	135
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	12.5 µg/kg	87.2	20.5	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	5 µg/kg	99.2	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	5 µg/kg	95.2	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4734093)							
ES2240147-042	1302_BIOAFA299_221026	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	5 µg/kg	93.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	12.5 µg/kg	98.9	88.1	105

Sub-Matrix: **BIOTA**

				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: 4734093) - continued							
ES2240147-042	1302_BIOAFA299_221026	EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	12.5 µg/kg	101	81.6	144
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	12.5 µg/kg	98.2	84.7	135
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	12.5 µg/kg	110	20.5	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	5 µg/kg	90.8	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	5 µg/kg	92.0	61.0	139
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4734094)							
ES2240147-062	1302_QC143_221025	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	5 µg/kg	108	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	12.5 µg/kg	101	88.1	105
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	12.5 µg/kg	85.6	81.6	144
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	12.5 µg/kg	100	84.7	135
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	12.5 µg/kg	106	20.5	150
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	5 µg/kg	98.8	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	5 µg/kg	94.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4734089)							
ES2240147-002	1302_BIOAFA259_221025	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	5 µg/kg	88.0	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	5 µg/kg	109	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	5 µg/kg	110	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	5 µg/kg	119	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4734090)							
ES2240147-022	1302_BIOAFA279_221025	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	5 µg/kg	104	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	5 µg/kg	107	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	5 µg/kg	97.6	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	5 µg/kg	94.8	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4734093)							
ES2240147-042	1302_BIOAFA299_221026	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	5 µg/kg	91.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	5 µg/kg	102	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	5 µg/kg	94.4	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	5 µg/kg	107	93.4	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4734094)							

Sub-Matrix: **BIOTA**

				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: 4734094) - continued							
ES2240147-062	1302_QC143_221025	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	5 µg/kg	98.8	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	5 µg/kg	114	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	5 µg/kg	107	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	5 µg/kg	95.2	93.4	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2240280**	Page	: 1 of 5
Client	[redacted]		
		No. of samples received	: 9
Order number	: 60612561	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

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

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	0	14	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	14	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: Date extracted	Due for extraction	Evaluation	Analysis: Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
1302_QC504_221024		**24-Oct-2022**	**29-Nov-2022**	22-Apr-2023	✓	**01-Dec-2022**	22-Apr-2023	✓
HDPE (no PTFE) (EP231X)								
1302_QC139_221025,	1302_SW019_221025	**25-Oct-2022**	**29-Nov-2022**	23-Apr-2023	✓	**01-Dec-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X)								
1302_SW020_221026		**26-Oct-2022**	**29-Nov-2022**	24-Apr-2023	✓	**01-Dec-2022**	24-Apr-2023	✓
HDPE (no PTFE) (EP231X)								
1302_SW021_221029,	1302_SW022_221029,	**29-Oct-2022**	**29-Nov-2022**	27-Apr-2023	✓	**01-Dec-2022**	27-Apr-2023	✓
1302_SW023_221029,	1302_SW024_221029							
HDPE (no PTFE) (EP231X)								
1302_QC304_221031		**31-Oct-2022**	**29-Nov-2022**	29-Apr-2023	✓	**01-Dec-2022**	29-Apr-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
1302_QC504_221024		**24-Oct-2022**	**29-Nov-2022**	22-Apr-2023	✓	**01-Dec-2022**	22-Apr-2023	✓
HDPE (no PTFE) (EP231X)								
1302_QC139_221025,	1302_SW019_221025	**25-Oct-2022**	**29-Nov-2022**	23-Apr-2023	✓	**01-Dec-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X)								
1302_SW020_221026		**26-Oct-2022**	**29-Nov-2022**	24-Apr-2023	✓	**01-Dec-2022**	24-Apr-2023	✓
HDPE (no PTFE) (EP231X)								
1302_SW021_221029,	1302_SW022_221029,	**29-Oct-2022**	**29-Nov-2022**	27-Apr-2023	✓	**01-Dec-2022**	27-Apr-2023	✓
1302_SW023_221029,	1302_SW024_221029							
HDPE (no PTFE) (EP231X)								
1302_QC304_221031		**31-Oct-2022**	**29-Nov-2022**	29-Apr-2023	✓	**01-Dec-2022**	29-Apr-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) 1302_QC504_221024	**24-Oct-2022**	**29-Nov-2022**	22-Apr-2023	✓	**01-Dec-2022**	22-Apr-2023	✓
HDPE (no PTFE) (EP231X) 1302_QC139_221025, 1302_SW019_221025	**25-Oct-2022**	**29-Nov-2022**	23-Apr-2023	✓	**01-Dec-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X) 1302_SW020_221026	**26-Oct-2022**	**29-Nov-2022**	24-Apr-2023	✓	**01-Dec-2022**	24-Apr-2023	✓
HDPE (no PTFE) (EP231X) 1302_SW021_221029, 1302_SW022_221029, 1302_SW023_221029, 1302_SW024_221029	**29-Oct-2022**	**29-Nov-2022**	27-Apr-2023	✓	**01-Dec-2022**	27-Apr-2023	✓
HDPE (no PTFE) (EP231X) 1302_QC304_221031	**31-Oct-2022**	**29-Nov-2022**	29-Apr-2023	✓	**01-Dec-2022**	29-Apr-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1302_QC504_221024	**24-Oct-2022**	**29-Nov-2022**	22-Apr-2023	✓	**01-Dec-2022**	22-Apr-2023	✓
HDPE (no PTFE) (EP231X) 1302_QC139_221025, 1302_SW019_221025	**25-Oct-2022**	**29-Nov-2022**	23-Apr-2023	✓	**01-Dec-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X) 1302_SW020_221026	**26-Oct-2022**	**29-Nov-2022**	24-Apr-2023	✓	**01-Dec-2022**	24-Apr-2023	✓
HDPE (no PTFE) (EP231X) 1302_SW021_221029, 1302_SW022_221029, 1302_SW023_221029, 1302_SW024_221029	**29-Oct-2022**	**29-Nov-2022**	27-Apr-2023	✓	**01-Dec-2022**	27-Apr-2023	✓
HDPE (no PTFE) (EP231X) 1302_QC304_221031	**31-Oct-2022**	**29-Nov-2022**	29-Apr-2023	✓	**01-Dec-2022**	29-Apr-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 1302_QC504_221024	**24-Oct-2022**	**29-Nov-2022**	22-Apr-2023	✓	**01-Dec-2022**	22-Apr-2023	✓
HDPE (no PTFE) (EP231X) 1302_QC139_221025, 1302_SW019_221025	**25-Oct-2022**	**29-Nov-2022**	23-Apr-2023	✓	**01-Dec-2022**	23-Apr-2023	✓
HDPE (no PTFE) (EP231X) 1302_SW020_221026	**26-Oct-2022**	**29-Nov-2022**	24-Apr-2023	✓	**01-Dec-2022**	24-Apr-2023	✓
HDPE (no PTFE) (EP231X) 1302_SW021_221029, 1302_SW022_221029, 1302_SW023_221029, 1302_SW024_221029	**29-Oct-2022**	**29-Nov-2022**	27-Apr-2023	✓	**01-Dec-2022**	27-Apr-2023	✓
HDPE (no PTFE) (EP231X) 1302_QC304_221031	**31-Oct-2022**	**29-Nov-2022**	29-Apr-2023	✓	**01-Dec-2022**	29-Apr-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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	14	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	14	**0.00**	**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
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.

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order [redacted]

[redacted]

Order number : 60612561

No. of samples received : 65

No. of samples analysed : 65

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 Matrix Spike outliers occur.**
- **Laboratory Control 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

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **BIOTA**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Laboratory Control Spike (LCS) Recoveries							
EP231D: (n:2) Fluorotelomer Sulfonic Acids	QC-4734090-002	----	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	86.0 %	93.4-130%	**Recovery less than lower control limit**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	QC-4734094-002	----	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	90.4 %	93.4-130%	**Recovery less than lower control limit**

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: **BIOTA**

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*
Biota Sample Pre-Preparation								
Snap Lock Bag - frozen (Biota-PP)								
1302_BIOAFA258_221025,	1302_BIOAFA259_221025,	**25-Oct-2022**	**29-Nov-2022**	----	----	**----**	----	----
1302_BIOAFA260_221025,	1302_BIOAFA261_221025,							
1302_BIOAFA262_221025,	1302_BIOAFA263_221025,							
1302_BIOAFA264_221025,	1302_BIOAFA265_221025,							
1302_BIOAFA266_221025,	1302_BIOAFA267_221025,							
1302_BIOAFA268_221025,	1302_BIOAFA269_221025,							
1302_BIOAFA270_221025,	1302_BIOAFA271_221025,							
1302_BIOAFA272_221025,	1302_BIOAFA273_221025,							
1302_BIOAFA274_221025,	1302_BIOAFA275_221025,							
1302_BIOAFA276_221025,	1302_BIOAFA277_221025,							
1302_BIOAFA278_221025,	1302_BIOAFA279_221025,							
1302_BIOAFA280_221025,	1302_BIOAFA281_221025,							
1302_BIOAFA282_221025,	1302_BIOAFA283_221025,							
1302_QC140_221025,	1302_QC141_221025,							
1302_QC142_221025,	1302_QC143_221025							
Snap Lock Bag - frozen (Biota-PP)								

Matrix: **BIOTA**

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
Biota Sample Pre-Preparation - Continued							
1302_BIOAFA289_221026, 1302_BIOAFA290_221026, 1302_BIOAFA291_221026, 1302_BIOAFA292_221026, 1302_BIOAFA293_221026, 1302_BIOAFA294_221026, 1302_BIOAFA295_221026, 1302_BIOAFA296_221026, 1302_BIOAFA297_221026, 1302_BIOAFA298_221026, 1302_BIOAFA299_221026, 1302_BIOAFA300_221026, 1302_BIOAFA301_221026, 1302_BIOAFA302_221026, 1302_BIOAFA303_221026, 1302_BIOAFA304_221026, 1302_BIOAFA305_221026, 1302_QC144_221026, 1302_QC145_221026, 1302_QC146_221026, 1302_QC147_221026	**26-Oct-2022**	**29-Nov-2022**	----	----	**----**	----	----
Snap Lock Bag - frozen (Biota-PP)							
1302_BIOAFA284_221029, 1302_BIOAFA285_221029, 1302_BIOAFA286_221029, 1302_BIOAFA287_221029, 1302_BIOAFA288_221029	**29-Oct-2022**	**29-Nov-2022**	----	----	**----**	----	----
Snap Lock Bag - frozen (Biota-PP)							
1302_BIOAFA306_221031, 1302_BIOAFA307_221031, 1302_BIOAFA308_221031, 1302_BIOAFA309_221031, 1302_BIOAFA310_221031, 1302_BIOAFA311_221031, 1302_BIOAFA312_221031, 1302_BIOAFA313_221031, 1302_BIOAFA314_221031	**31-Oct-2022**	**29-Nov-2022**	----	----	**----**	----	----

Matrix: **BIOTA**

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							
Snap Lock Bag - frozen (EP231-PFOS-SP)							
1302_BIOAFA258_221025, 1302_BIOAFA259_221025, 1302_BIOAFA260_221025, 1302_BIOAFA261_221025, 1302_BIOAFA262_221025, 1302_BIOAFA263_221025, 1302_BIOAFA264_221025, 1302_BIOAFA265_221025, 1302_BIOAFA266_221025, 1302_BIOAFA267_221025, 1302_BIOAFA268_221025, 1302_BIOAFA269_221025, 1302_BIOAFA270_221025, 1302_BIOAFA271_221025, 1302_BIOAFA272_221025, 1302_BIOAFA273_221025, 1302_BIOAFA274_221025, 1302_BIOAFA275_221025, 1302_BIOAFA276_221025, 1302_BIOAFA277_221025	**25-Oct-2022**	**07-Dec-2022**	23-Apr-2023	✓	**16-Dec-2022**	16-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA258_221025, 1302_BIOAFA259_221025, 1302_BIOAFA260_221025, 1302_BIOAFA261_221025, 1302_BIOAFA262_221025, 1302_BIOAFA263_221025, 1302_BIOAFA264_221025, 1302_BIOAFA265_221025, 1302_BIOAFA266_221025, 1302_BIOAFA267_221025, 1302_BIOAFA268_221025, 1302_BIOAFA269_221025, 1302_BIOAFA270_221025, 1302_BIOAFA271_221025, 1302_BIOAFA272_221025, 1302_BIOAFA273_221025, 1302_BIOAFA274_221025, 1302_BIOAFA275_221025, 1302_BIOAFA276_221025, 1302_BIOAFA277_221025	**25-Oct-2022**	**07-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	16-Jan-2023	✓
Snap Lock Bag - frozen (EP231-PFOS-SP)							
1302_BIOAFA278_221025, 1302_BIOAFA279_221025, 1302_BIOAFA280_221025, 1302_BIOAFA281_221025, 1302_BIOAFA282_221025, 1302_BIOAFA283_221025	**25-Oct-2022**	**09-Dec-2022**	23-Apr-2023	✓	**16-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA278_221025, 1302_BIOAFA279_221025, 1302_BIOAFA280_221025, 1302_BIOAFA281_221025, 1302_BIOAFA282_221025, 1302_BIOAFA283_221025	**25-Oct-2022**	**09-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231-PFOS-SP)							
1302_QC140_221025, 1302_QC141_221025, 1302_QC142_221025, 1302_QC143_221025	**25-Oct-2022**	**15-Dec-2022**	23-Apr-2023	✓	**16-Dec-2022**	24-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_QC140_221025, 1302_QC141_221025, 1302_QC142_221025, 1302_QC143_221025	**25-Oct-2022**	**15-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	24-Jan-2023	✓
Snap Lock Bag - frozen (EP231-PFOS-SP)							
1302_BIOAFA289_221026, 1302_BIOAFA290_221026, 1302_BIOAFA291_221026, 1302_BIOAFA292_221026, 1302_BIOAFA293_221026, 1302_BIOAFA294_221026, 1302_BIOAFA295_221026, 1302_BIOAFA296_221026, 1302_BIOAFA297_221026	**26-Oct-2022**	**09-Dec-2022**	24-Apr-2023	✓	**16-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							

Matrix: **BIOTA**

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 - Continued							
1302_BIOAFA289_221026, 1302_BIOAFA290_221026, 1302_BIOAFA291_221026, 1302_BIOAFA292_221026, 1302_BIOAFA293_221026, 1302_BIOAFA294_221026, 1302_BIOAFA295_221026, 1302_BIOAFA296_221026, 1302_BIOAFA297_221026	**26-Oct-2022**	**09-Dec-2022**	24-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231-PFOS-SP)							
1302_BIOAFA298_221026, 1302_BIOAFA299_221026, 1302_BIOAFA300_221026, 1302_BIOAFA301_221026, 1302_BIOAFA302_221026, 1302_BIOAFA303_221026, 1302_BIOAFA304_221026, 1302_BIOAFA305_221026, 1302_QC144_221026, 1302_QC145_221026, 1302_QC146_221026, 1302_QC147_221026	**26-Oct-2022**	**15-Dec-2022**	24-Apr-2023	✓	**16-Dec-2022**	24-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA298_221026, 1302_BIOAFA299_221026, 1302_BIOAFA300_221026, 1302_BIOAFA301_221026, 1302_BIOAFA302_221026, 1302_BIOAFA303_221026, 1302_BIOAFA304_221026, 1302_BIOAFA305_221026, 1302_QC144_221026, 1302_QC145_221026, 1302_QC146_221026, 1302_QC147_221026	**26-Oct-2022**	**15-Dec-2022**	24-Apr-2023	✓	**19-Dec-2022**	24-Jan-2023	✓
Snap Lock Bag - frozen (EP231-PFOS-SP)							
1302_BIOAFA284_221029, 1302_BIOAFA285_221029, 1302_BIOAFA286_221029, 1302_BIOAFA287_221029, 1302_BIOAFA288_221029	**29-Oct-2022**	**09-Dec-2022**	27-Apr-2023	✓	**16-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA284_221029, 1302_BIOAFA285_221029, 1302_BIOAFA286_221029, 1302_BIOAFA287_221029, 1302_BIOAFA288_221029	**29-Oct-2022**	**09-Dec-2022**	27-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231-PFOS-SP)							
1302_BIOAFA306_221031, 1302_BIOAFA307_221031, 1302_BIOAFA308_221031, 1302_BIOAFA309_221031, 1302_BIOAFA310_221031, 1302_BIOAFA311_221031, 1302_BIOAFA312_221031, 1302_BIOAFA313_221031, 1302_BIOAFA314_221031	**31-Oct-2022**	**15-Dec-2022**	29-Apr-2023	✓	**16-Dec-2022**	24-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA306_221031, 1302_BIOAFA307_221031, 1302_BIOAFA308_221031, 1302_BIOAFA309_221031, 1302_BIOAFA310_221031, 1302_BIOAFA311_221031, 1302_BIOAFA312_221031, 1302_BIOAFA313_221031, 1302_BIOAFA314_221031	**31-Oct-2022**	**15-Dec-2022**	29-Apr-2023	✓	**19-Dec-2022**	24-Jan-2023	✓

Matrix: **BIOTA**

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							
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA258_221025, 1302_BIOAFA259_221025, 1302_BIOAFA260_221025, 1302_BIOAFA261_221025, 1302_BIOAFA262_221025, 1302_BIOAFA263_221025, 1302_BIOAFA264_221025, 1302_BIOAFA265_221025, 1302_BIOAFA266_221025, 1302_BIOAFA267_221025, 1302_BIOAFA268_221025, 1302_BIOAFA269_221025, 1302_BIOAFA270_221025, 1302_BIOAFA271_221025, 1302_BIOAFA272_221025, 1302_BIOAFA273_221025, 1302_BIOAFA274_221025, 1302_BIOAFA275_221025, 1302_BIOAFA276_221025, 1302_BIOAFA277_221025	**25-Oct-2022**	**07-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	16-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA278_221025, 1302_BIOAFA279_221025, 1302_BIOAFA280_221025, 1302_BIOAFA281_221025, 1302_BIOAFA282_221025, 1302_BIOAFA283_221025	**25-Oct-2022**	**09-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_QC140_221025, 1302_QC141_221025, 1302_QC142_221025, 1302_QC143_221025	**25-Oct-2022**	**15-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	24-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA289_221026, 1302_BIOAFA290_221026, 1302_BIOAFA291_221026, 1302_BIOAFA292_221026, 1302_BIOAFA293_221026, 1302_BIOAFA294_221026, 1302_BIOAFA295_221026, 1302_BIOAFA296_221026, 1302_BIOAFA297_221026	**26-Oct-2022**	**09-Dec-2022**	24-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA298_221026, 1302_BIOAFA299_221026, 1302_BIOAFA300_221026, 1302_BIOAFA301_221026, 1302_BIOAFA302_221026, 1302_BIOAFA303_221026, 1302_BIOAFA304_221026, 1302_BIOAFA305_221026, 1302_QC144_221026, 1302_QC145_221026, 1302_QC146_221026, 1302_QC147_221026	**26-Oct-2022**	**15-Dec-2022**	24-Apr-2023	✓	**19-Dec-2022**	24-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA284_221029, 1302_BIOAFA285_221029, 1302_BIOAFA286_221029, 1302_BIOAFA287_221029, 1302_BIOAFA288_221029	**29-Oct-2022**	**09-Dec-2022**	27-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA306_221031, 1302_BIOAFA307_221031, 1302_BIOAFA308_221031, 1302_BIOAFA309_221031, 1302_BIOAFA310_221031, 1302_BIOAFA311_221031, 1302_BIOAFA312_221031, 1302_BIOAFA313_221031, 1302_BIOAFA314_221031	**31-Oct-2022**	**15-Dec-2022**	29-Apr-2023	✓	**19-Dec-2022**	24-Jan-2023	✓

Matrix: **BIOTA**

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							
Snap Lock Bag - frozen (EP231X) 1302_BIOAFA258_221025, 1302_BIOAFA259_221025, 1302_BIOAFA260_221025, 1302_BIOAFA261_221025, 1302_BIOAFA262_221025, 1302_BIOAFA263_221025, 1302_BIOAFA264_221025, 1302_BIOAFA265_221025, 1302_BIOAFA266_221025, 1302_BIOAFA267_221025, 1302_BIOAFA268_221025, 1302_BIOAFA269_221025, 1302_BIOAFA270_221025, 1302_BIOAFA271_221025, 1302_BIOAFA272_221025, 1302_BIOAFA273_221025, 1302_BIOAFA274_221025, 1302_BIOAFA275_221025, 1302_BIOAFA276_221025, 1302_BIOAFA277_221025	**25-Oct-2022**	**07-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	16-Jan-2023	✓
Snap Lock Bag - frozen (EP231X) 1302_BIOAFA278_221025, 1302_BIOAFA279_221025, 1302_BIOAFA280_221025, 1302_BIOAFA281_221025, 1302_BIOAFA282_221025, 1302_BIOAFA283_221025	**25-Oct-2022**	**09-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X) 1302_QC140_221025, 1302_QC141_221025, 1302_QC142_221025, 1302_QC143_221025	**25-Oct-2022**	**15-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	24-Jan-2023	✓
Snap Lock Bag - frozen (EP231X) 1302_BIOAFA289_221026, 1302_BIOAFA290_221026, 1302_BIOAFA291_221026, 1302_BIOAFA292_221026, 1302_BIOAFA293_221026, 1302_BIOAFA294_221026, 1302_BIOAFA295_221026, 1302_BIOAFA296_221026, 1302_BIOAFA297_221026	**26-Oct-2022**	**09-Dec-2022**	24-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X) 1302_BIOAFA298_221026, 1302_BIOAFA299_221026, 1302_BIOAFA300_221026, 1302_BIOAFA301_221026, 1302_BIOAFA302_221026, 1302_BIOAFA303_221026, 1302_BIOAFA304_221026, 1302_BIOAFA305_221026, 1302_QC144_221026, 1302_QC145_221026, 1302_QC146_221026, 1302_QC147_221026	**26-Oct-2022**	**15-Dec-2022**	24-Apr-2023	✓	**19-Dec-2022**	24-Jan-2023	✓
Snap Lock Bag - frozen (EP231X) 1302_BIOAFA284_221029, 1302_BIOAFA285_221029, 1302_BIOAFA286_221029, 1302_BIOAFA287_221029, 1302_BIOAFA288_221029	**29-Oct-2022**	**09-Dec-2022**	27-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X) 1302_BIOAFA306_221031, 1302_BIOAFA307_221031, 1302_BIOAFA308_221031, 1302_BIOAFA309_221031, 1302_BIOAFA310_221031, 1302_BIOAFA311_221031, 1302_BIOAFA312_221031, 1302_BIOAFA313_221031, 1302_BIOAFA314_221031	**31-Oct-2022**	**15-Dec-2022**	29-Apr-2023	✓	**19-Dec-2022**	24-Jan-2023	✓

Matrix: **BIOTA**

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							
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA258_221025, 1302_BIOAFA259_221025, 1302_BIOAFA260_221025, 1302_BIOAFA261_221025, 1302_BIOAFA262_221025, 1302_BIOAFA263_221025, 1302_BIOAFA264_221025, 1302_BIOAFA265_221025, 1302_BIOAFA266_221025, 1302_BIOAFA267_221025, 1302_BIOAFA268_221025, 1302_BIOAFA269_221025, 1302_BIOAFA270_221025, 1302_BIOAFA271_221025, 1302_BIOAFA272_221025, 1302_BIOAFA273_221025, 1302_BIOAFA274_221025, 1302_BIOAFA275_221025, 1302_BIOAFA276_221025, 1302_BIOAFA277_221025	**25-Oct-2022**	**07-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	16-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA278_221025, 1302_BIOAFA279_221025, 1302_BIOAFA280_221025, 1302_BIOAFA281_221025, 1302_BIOAFA282_221025, 1302_BIOAFA283_221025	**25-Oct-2022**	**09-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_QC140_221025, 1302_QC141_221025, 1302_QC142_221025, 1302_QC143_221025	**25-Oct-2022**	**15-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	24-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA289_221026, 1302_BIOAFA290_221026, 1302_BIOAFA291_221026, 1302_BIOAFA292_221026, 1302_BIOAFA293_221026, 1302_BIOAFA294_221026, 1302_BIOAFA295_221026, 1302_BIOAFA296_221026, 1302_BIOAFA297_221026	**26-Oct-2022**	**09-Dec-2022**	24-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA298_221026, 1302_BIOAFA299_221026, 1302_BIOAFA300_221026, 1302_BIOAFA301_221026, 1302_BIOAFA302_221026, 1302_BIOAFA303_221026, 1302_BIOAFA304_221026, 1302_BIOAFA305_221026, 1302_QC144_221026, 1302_QC145_221026, 1302_QC146_221026, 1302_QC147_221026	**26-Oct-2022**	**15-Dec-2022**	24-Apr-2023	✓	**19-Dec-2022**	24-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA284_221029, 1302_BIOAFA285_221029, 1302_BIOAFA286_221029, 1302_BIOAFA287_221029, 1302_BIOAFA288_221029	**29-Oct-2022**	**09-Dec-2022**	27-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA306_221031, 1302_BIOAFA307_221031, 1302_BIOAFA308_221031, 1302_BIOAFA309_221031, 1302_BIOAFA310_221031, 1302_BIOAFA311_221031, 1302_BIOAFA312_221031, 1302_BIOAFA313_221031, 1302_BIOAFA314_221031	**31-Oct-2022**	**15-Dec-2022**	29-Apr-2023	✓	**19-Dec-2022**	24-Jan-2023	✓

Matrix: **BIOTA**

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
EP231P: PFAS Sums							
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA258_221025, 1302_BIOAFA259_221025, 1302_BIOAFA260_221025, 1302_BIOAFA261_221025, 1302_BIOAFA262_221025, 1302_BIOAFA263_221025, 1302_BIOAFA264_221025, 1302_BIOAFA265_221025, 1302_BIOAFA266_221025, 1302_BIOAFA267_221025, 1302_BIOAFA268_221025, 1302_BIOAFA269_221025, 1302_BIOAFA270_221025, 1302_BIOAFA271_221025, 1302_BIOAFA272_221025, 1302_BIOAFA273_221025, 1302_BIOAFA274_221025, 1302_BIOAFA275_221025, 1302_BIOAFA276_221025, 1302_BIOAFA277_221025	**25-Oct-2022**	**07-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	16-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA278_221025, 1302_BIOAFA279_221025, 1302_BIOAFA280_221025, 1302_BIOAFA281_221025, 1302_BIOAFA282_221025, 1302_BIOAFA283_221025	**25-Oct-2022**	**09-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_QC140_221025, 1302_QC141_221025, 1302_QC142_221025, 1302_QC143_221025	**25-Oct-2022**	**15-Dec-2022**	23-Apr-2023	✓	**19-Dec-2022**	24-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA289_221026, 1302_BIOAFA290_221026, 1302_BIOAFA291_221026, 1302_BIOAFA292_221026, 1302_BIOAFA293_221026, 1302_BIOAFA294_221026, 1302_BIOAFA295_221026, 1302_BIOAFA296_221026, 1302_BIOAFA297_221026	**26-Oct-2022**	**09-Dec-2022**	24-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA298_221026, 1302_BIOAFA299_221026, 1302_BIOAFA300_221026, 1302_BIOAFA301_221026, 1302_BIOAFA302_221026, 1302_BIOAFA303_221026, 1302_BIOAFA304_221026, 1302_BIOAFA305_221026, 1302_QC144_221026, 1302_QC145_221026, 1302_QC146_221026, 1302_QC147_221026	**26-Oct-2022**	**15-Dec-2022**	24-Apr-2023	✓	**19-Dec-2022**	24-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA284_221029, 1302_BIOAFA285_221029, 1302_BIOAFA286_221029, 1302_BIOAFA287_221029, 1302_BIOAFA288_221029	**29-Oct-2022**	**09-Dec-2022**	27-Apr-2023	✓	**19-Dec-2022**	18-Jan-2023	✓
Snap Lock Bag - frozen (EP231X)							
1302_BIOAFA306_221031, 1302_BIOAFA307_221031, 1302_BIOAFA308_221031, 1302_BIOAFA309_221031, 1302_BIOAFA310_221031, 1302_BIOAFA311_221031, 1302_BIOAFA312_221031, 1302_BIOAFA313_221031, 1302_BIOAFA314_221031	**31-Oct-2022**	**15-Dec-2022**	29-Apr-2023	✓	**19-Dec-2022**	24-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: **BIOTA**

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	8	79	**10.13**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	79	**5.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	79	**5.06**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	4	79	**5.06**	**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
PFOS - Linear/Branched Speciation	EP231-PFOS-SP	BIOTA	In-house: Linear PFOS is determined by quantiation of the separate linear peak using linear PFOS. Branched PFOS is determined as the difference between total PFOS (determined using a mixed linear/branched standard) and linear PFOS.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	BIOTA	In-house: A sample extract is analysed 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 biota which is then solvent extracted. 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
Prep-Preparation for Biota Analysis	* Biota-PP	BIOTA	A sample is prepared from whole or particular tissues/organs, identified, homogenised and the total weight of prepared sample recorded.
Sample Preparation for PFAS in Biota	EP231-PR	BIOTA	In-house: Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of homogenised biota 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 conform to US DoD QSM 5.3, table B-15 requirements.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **ES2242803**		
Client	[redacted]	Laboratory	[redacted]
Contact		Contact	
Address		Address	
E-mail		E-mail	
Telephone		Telephone	
Facsimile		Facsimile	
Project		Page	
Order number		Quote number	
C-O-C number	: ----	QC Level	
Site	: ----		
Sampler	: [redacted]		

Dates

Date Samples Received	: 29-Nov-2022 08:30	Issue Date	: 29-Nov-2022
Client Requested Due Date	: 06-Dec-2022	Scheduled Reporting Date	: **06-Dec-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 7.5 'C SYD
Receipt Detail	:	No. of samples received / analysed	: 25 / 25

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 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.**
- **Samples 1302_QC201_221123 and 1302_QC200_221123 forwarded to NMI Sydney for analysis.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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)
ES2242803-001	23-Nov-2022 00:00	1302_SW106_221123	✓
ES2242803-002	23-Nov-2022 00:00	1302_QC101_221123	✓
ES2242803-004	23-Nov-2022 00:00	1302_SW114_221123	✓
ES2242803-005	23-Nov-2022 00:00	1302_SW104_221123	✓
ES2242803-006	24-Nov-2022 00:00	1302_SW132_221124	✓
ES2242803-007	24-Nov-2022 00:00	1302_QC100_221124	✓
ES2242803-008	24-Nov-2022 00:00	1302_QC200_221124	✓
ES2242803-009	24-Nov-2022 00:00	1302_SW133_221124	✓
ES2242803-010	24-Nov-2022 00:00	1302_SW143_221124	✓
ES2242803-011	24-Nov-2022 00:00	1302_SW170_221124	✓
ES2242803-012	25-Nov-2022 00:00	1302_SW162_221125	✓
ES2242803-013	23-Nov-2022 00:00	1302_SW125_221123	✓
ES2242803-014	23-Nov-2022 00:00	1302_QC100_221123	✓
ES2242803-016	23-Nov-2022 00:00	1302_SW120_221123	✓
ES2242803-017	23-Nov-2022 00:00	1302_SW124_221123	✓
ES2242803-018	23-Nov-2022 00:00	1302_SW113_221123	✓
ES2242803-019	23-Nov-2022 00:00	1302_SW112_221123	✓
ES2242803-020	23-Nov-2022 00:00	1302_SW109_221123	✓
ES2242803-021	23-Nov-2022 00:00	1302_SW156_221123	✓
ES2242803-022	23-Nov-2022 00:00	1302_SW168_221123	✓
ES2242803-023	23-Nov-2022 00:00	1302_SW108_221123	✓
ES2242803-024	23-Nov-2022 00:00	1302_SW115_221123	✓
ES2242803-025	25-Nov-2022 00:00	1302_SW178_221125	✓
ES2242803-026	24-Nov-2022 00:00	1302_QC300_221124	✓
ES2242803-027	24-Nov-2022 00:00	1302_QC400_221124	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV) — Email

[redacted] — Email

[redacted] — Email

[redacted] — Email
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[redacted] — Email
[redacted] — Email
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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	[redacted]	Page	: 1 of 13
Client	[redacted]	Laboratory	: Environmental Division Sydney
Contact	[redacted]	Contact	[redacted]
	[redacted]		
Order number	[redacted]	Date Analysis Commenced	: 29-Nov-2022
C-O-C number	[redacted]	Issue Date	: 07-Dec-2022 14:33
Sampler	[redacted]		
Site	[redacted]		
Quote number	[redacted]		
No. of samples received	: 25		
No. of samples analysed	: 24		

ilac-MRA NATA

A [redacted]

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. 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*
[redacted]	[redacted]	[redacted]

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.
- 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: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW106_221123	1302_QC101_221123	1302_SW114_221123	1302_SW104_221123	1302_SW132_221124
				Sampling date / time	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00	24-Nov-2022 00:00
					ES2242803-001	ES2242803-002	ES2242803-004	ES2242803-005	ES2242803-006
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.03**	**0.03**	<0.02	**0.05**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.03**	**0.03**	<0.02	**0.04**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.19**	**0.20**	<0.01	**0.31**	**0.03**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.03**	**0.03**	<0.02	**0.04**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.28**	**0.32**	<0.01	**0.63**	**0.07**
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		**0.03**	**0.03**	<0.02	**0.07**	<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	**0.02**	<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: WATER (Matrix: WATER)				Sample ID	1302_SW106_221123	1302_QC101_221123	1302_SW114_221123	1302_SW104_221123	1302_SW132_221124
				Sampling date / time	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00	24-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		ES2242803-001	ES2242803-002	ES2242803-004	ES2242803-005	ES2242803-006
					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		**0.59**	**0.64**	<0.01	**1.16**	**0.10**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.47**	**0.52**	<0.01	**0.94**	**0.10**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.53**	**0.58**	<0.01	**1.08**	**0.10**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.1**	**109**	**96.5**	**96.2**	**106**
13C8-PFOA	----	0.02	%		**104**	**101**	**106**	**102**	**100**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_QC100_221124	1302_SW133_221124	1302_SW143_221124	1302_SW170_221124	1302_SW162_221125
				Sampling date / time	24-Nov-2022 00:00	24-Nov-2022 00:00	24-Nov-2022 00:00	24-Nov-2022 00:00	25-Nov-2022 00:00
					ES2242803-007	ES2242803-009	ES2242803-010	ES2242803-011	ES2242803-012
					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		**0.03**	**0.05**	**0.02**	**0.05**	**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		**0.07**	**0.04**	**0.03**	**0.85**	**0.05**
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	**0.03**	<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: WATER (Matrix: WATER)				Sample ID	1302_QC100_221124	1302_SW133_221124	1302_SW143_221124	1302_SW170_221124	1302_SW162_221125
				Sampling date / time	24-Nov-2022 00:00	24-Nov-2022 00:00	24-Nov-2022 00:00	24-Nov-2022 00:00	25-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		ES2242803-007	ES2242803-009	ES2242803-010	ES2242803-011	ES2242803-012
					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		**0.10**	**0.14**	**0.05**	**0.90**	**0.06**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.10**	**0.09**	**0.05**	**0.90**	**0.06**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.10**	**0.14**	**0.05**	**0.90**	**0.06**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**91.4**	**97.1**	**95.4**	**95.2**
13C8-PFOA	----	0.02	%		**98.8**	**99.1**	**103**	**98.5**	**96.5**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW125_221123	1302_QC100_221123	1302_SW120_221123	1302_SW124_221123	1302_SW113_221123
				Sampling date / time	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00
					ES2242803-013	ES2242803-014	ES2242803-016	ES2242803-017	ES2242803-018
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.08**	**0.10**	**0.03**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.11**	**0.12**	**0.03**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.07**	**1.18**	**0.28**	**0.01**	**0.02**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.06**	**0.07**	**0.03**	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.95**	**2.27**	**0.58**	**0.05**	**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		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.05**	**0.06**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.17**	**0.20**	**0.06**	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.03**	**0.03**	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.06**	**0.06**	**0.02**	<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: WATER (Matrix: WATER)				Sample ID	1302_SW125_221123	1302_QC100_221123	1302_SW120_221123	1302_SW124_221123	1302_SW113_221123
				Sampling date / time	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		ES2242803-013	ES2242803-014	ES2242803-016	ES2242803-017	ES2242803-018
					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		**3.58**	**4.09**	**1.03**	**0.06**	**0.06**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**3.02**	**3.45**	**0.86**	**0.06**	**0.06**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**3.41**	**3.90**	**0.97**	**0.06**	**0.06**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.5**	**97.0**	**96.6**	**95.1**	**98.7**
13C8-PFOA	----	0.02	%		**102**	**102**	**99.6**	**96.6**	**102**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW112_221123	1302_SW109_221123	1302_SW156_221123	1302_SW168_221123	1302_SW108_221123
				Sampling date / time	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00
					ES2242803-019	ES2242803-020	ES2242803-021	ES2242803-022	ES2242803-023
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.04**	<0.02	**0.08**	**0.03**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.04**	<0.02	**0.08**	**0.03**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.14**	**0.33**	<0.01	**0.62**	**0.21**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.03**	<0.02	**0.09**	**0.03**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.27**	**0.58**	**0.05**	**1.20**	**0.36**
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		**0.03**	**0.08**	<0.02	**0.17**	**0.04**
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	**0.02**	<0.01	**0.04**	**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: WATER (Matrix: WATER)				Sample ID	1302_SW112_221123	1302_SW109_221123	1302_SW156_221123	1302_SW168_221123	1302_SW108_221123
				Sampling date / time	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00	23-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		ES2242803-019	ES2242803-020	ES2242803-021	ES2242803-022	ES2242803-023
					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		**0.44**	**1.12**	**0.05**	**2.30**	**0.71**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.41**	**0.91**	**0.05**	**1.82**	**0.57**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.44**	**1.05**	**0.05**	**2.13**	**0.65**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	**91.7**	**94.0**	**100**	**90.4**
13C8-PFOA	----	0.02	%		**102**	**101**	**99.4**	**106**	**111**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW115_221123	1302_SW178_221125	1302_QC300_221124	1302_QC400_221124	----
				Sampling date / time	23-Nov-2022 00:00	25-Nov-2022 00:00	24-Nov-2022 00:00	24-Nov-2022 00:00	----
Compound	CAS Number	LOR	Unit		ES2242803-024	ES2242803-025	ES2242803-026	ES2242803-027	--------
					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	----
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	**0.09**	<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	----
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	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW115_221123	1302_SW178_221125	1302_QC300_221124	1302_QC400_221124	----
				Sampling date / time	23-Nov-2022 00:00	25-Nov-2022 00:00	24-Nov-2022 00:00	24-Nov-2022 00:00	----
Compound	CAS Number	LOR	Unit		ES2242803-024	ES2242803-025	ES2242803-026	ES2242803-027	--------
					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	----
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	----
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	**0.09**	<0.01	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.09**	<0.01	<0.01	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.09**	<0.01	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.2**	**103**	**100**	**81.9**	----
13C8-PFOA	----	0.02	%		**109**	**107**	**107**	**108**	----

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	[redacted]	Page	: 1 of 8
Client	[redacted]	Laboratory	[redacted]
Order number		Date Analysis Commenced	: 29-Nov-2022
C-O-C number		Issue Date	: 07-Dec-2022
Sampler			
Site			
Quote number			
No. of samples received	: 25		
No. of samples analysed	: 24		

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*
[redacted]	[redacted]	[redacted]

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 (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4736242)									
ES2242809-003	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.05	0.06	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.20	0.18	9.1	0% - 50%
		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
ES2242809-011	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: 4736242)									
ES2242809-003	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

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: 4736242) - continued									
ES2242809-011	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: 4736242)									
ES2242809-003	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
ES2242809-011	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: 4736242)									
ES2242809-003	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

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: 4736242) - continued									
ES2242809-003	Anonymous	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
ES2242809-011	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: 4736242)									
ES2242809-003	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.28	0.27	3.6	0% - 20%
ES2242809-011	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4735756)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	77.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	87.0	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	78.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	95.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	79.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	80.6	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4736242)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	89.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	80.0	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	105	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	91.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	97.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4735756)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	76.2	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	81.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	81.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	78.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	82.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	87.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	80.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	100	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	96.2	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	85.7	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4736242)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	82.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	93.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	90.8	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.4	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	110	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	112	69.0	133

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: 4736242) - continued								
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	122	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	128	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	100	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4735756)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	80.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	86.6	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	95.8	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	85.1	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	86.7	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	85.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	77.0	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4736242)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	84.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	93.6	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	114	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	99.9	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	99.0	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	110	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	95.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4735756)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	83.2	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	79.0	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	80.2	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	101	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4736242)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	85.6	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	88.0	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	83.4	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	124	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4736242)							
ES2242809-010	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	109	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	87.2	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	121	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	118	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	108	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4736242)							
ES2242809-010	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	105	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	99.8	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	121	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	110	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	118	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	129	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	129	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	124	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	116	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	124	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4736242)							
ES2242809-010	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	97.0	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	117	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	124	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	113	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	109	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	108	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4736242)							
ES2242809-010	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	107	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	101	64.0	140

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: 4736242) - continued							
ES2242809-010	Anonymous	EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	99.8	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	125	71.4	144

ALS Environmental

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Sampler	[redacted]	No. of samples received	: 25
Order number	[redacted]	No. of samples analysed	: 24

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

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

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	38	5.26	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	1	38	2.63	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
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW106_221123, 1302_QC101_221123, 1302_SW114_221123, 1302_SW104_221123, 1302_SW125_221123, 1302_QC100_221123, 1302_SW120_221123, 1302_SW124_221123, 1302_SW113_221123, 1302_SW112_221123, 1302_SW109_221123, 1302_SW156_221123, 1302_SW168_221123, 1302_SW108_221123, 1302_SW115_221123	**23-Nov-2022**	**30-Nov-2022**	22-May-2023	✓	**07-Dec-2022**	22-May-2023	✓
HDPE (no PTFE) (EP231X)							
1302_SW132_221124, 1302_QC100_221124, 1302_SW133_221124, 1302_SW143_221124, 1302_SW170_221124, 1302_QC300_221124, 1302_QC400_221124	**24-Nov-2022**	**30-Nov-2022**	23-May-2023	✓	**07-Dec-2022**	23-May-2023	✓
HDPE (no PTFE) (EP231X)							
1302_SW162_221125, 1302_SW178_221125	**25-Nov-2022**	**30-Nov-2022**	24-May-2023	✓	**07-Dec-2022**	24-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) 1302_SW106_221123, 1302_QC101_221123, 1302_SW114_221123, 1302_SW104_221123, 1302_SW125_221123, 1302_QC100_221123, 1302_SW120_221123, 1302_SW124_221123, 1302_SW113_221123, 1302_SW112_221123, 1302_SW109_221123, 1302_SW156_221123, 1302_SW168_221123, 1302_SW108_221123, 1302_SW115_221123	**23-Nov-2022**	**30-Nov-2022**	22-May-2023	✓	**07-Dec-2022**	22-May-2023	✓
HDPE (no PTFE) (EP231X) 1302_SW132_221124, 1302_QC100_221124, 1302_SW133_221124, 1302_SW143_221124, 1302_SW170_221124, 1302_QC300_221124, 1302_QC400_221124	**24-Nov-2022**	**30-Nov-2022**	23-May-2023	✓	**07-Dec-2022**	23-May-2023	✓
HDPE (no PTFE) (EP231X) 1302_SW162_221125, 1302_SW178_221125	**25-Nov-2022**	**30-Nov-2022**	24-May-2023	✓	**07-Dec-2022**	24-May-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 1302_SW106_221123, 1302_QC101_221123, 1302_SW114_221123, 1302_SW104_221123, 1302_SW125_221123, 1302_QC100_221123, 1302_SW120_221123, 1302_SW124_221123, 1302_SW113_221123, 1302_SW112_221123, 1302_SW109_221123, 1302_SW156_221123, 1302_SW168_221123, 1302_SW108_221123, 1302_SW115_221123	**23-Nov-2022**	**30-Nov-2022**	22-May-2023	✓	**07-Dec-2022**	22-May-2023	✓
HDPE (no PTFE) (EP231X) 1302_SW132_221124, 1302_QC100_221124, 1302_SW133_221124, 1302_SW143_221124, 1302_SW170_221124, 1302_QC300_221124, 1302_QC400_221124	**24-Nov-2022**	**30-Nov-2022**	23-May-2023	✓	**07-Dec-2022**	23-May-2023	✓
HDPE (no PTFE) (EP231X) 1302_SW162_221125, 1302_SW178_221125	**25-Nov-2022**	**30-Nov-2022**	24-May-2023	✓	**07-Dec-2022**	24-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)							
1302_SW106_221123, 1302_QC101_221123, 1302_SW114_221123, 1302_SW104_221123, 1302_SW125_221123, 1302_QC100_221123, 1302_SW120_221123, 1302_SW124_221123, 1302_SW113_221123, 1302_SW112_221123, 1302_SW109_221123, 1302_SW156_221123, 1302_SW168_221123, 1302_SW108_221123, 1302_SW115_221123	**23-Nov-2022**	**30-Nov-2022**	22-May-2023	✓	**07-Dec-2022**	22-May-2023	✓
HDPE (no PTFE) (EP231X)							
1302_SW132_221124, 1302_QC100_221124, 1302_SW133_221124, 1302_SW143_221124, 1302_SW170_221124, 1302_QC300_221124, 1302_QC400_221124	**24-Nov-2022**	**30-Nov-2022**	23-May-2023	✓	**07-Dec-2022**	23-May-2023	✓
HDPE (no PTFE) (EP231X)							
1302_SW162_221125, 1302_SW178_221125	**25-Nov-2022**	**30-Nov-2022**	24-May-2023	✓	**07-Dec-2022**	24-May-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_SW106_221123, 1302_QC101_221123, 1302_SW114_221123, 1302_SW104_221123, 1302_SW125_221123, 1302_QC100_221123, 1302_SW120_221123, 1302_SW124_221123, 1302_SW113_221123, 1302_SW112_221123, 1302_SW109_221123, 1302_SW156_221123, 1302_SW168_221123, 1302_SW108_221123, 1302_SW115_221123	**23-Nov-2022**	**30-Nov-2022**	22-May-2023	✓	**07-Dec-2022**	22-May-2023	✓
HDPE (no PTFE) (EP231X)							
1302_SW132_221124, 1302_QC100_221124, 1302_SW133_221124, 1302_SW143_221124, 1302_SW170_221124, 1302_QC300_221124, 1302_QC400_221124	**24-Nov-2022**	**30-Nov-2022**	23-May-2023	✓	**07-Dec-2022**	23-May-2023	✓
HDPE (no PTFE) (EP231X)							
1302_SW162_221125, 1302_SW178_221125	**25-Nov-2022**	**30-Nov-2022**	24-May-2023	✓	**07-Dec-2022**	24-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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	38	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	38	**2.63**	**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
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	: **ES2243233**		
Client	: [redacted]	Laboratory	: Environmental Division Sydney
Contact	[redacted]	Contact	: [redacted]
Address	: [redacted]	Address	[redacted]
E-mail	[redacted]	E-mail	[redacted]
Telephone	: ----	Telephone	[redacted]
Facsimile	: ----	Facsimile	
Project	: NT_1302_PFASOMP	Page	: 1 of 3
Order number	: 60612561 / 4.1	Quote number	: ES2019AECOMAU0030 (SY/139/19 V3)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: [redacted]		

Dates

Date Samples Received	: 01-Dec-2022 08:30	Issue Date	: 01-Dec-2022
Client Requested Due Date	: 08-Dec-2022	Scheduled Reporting Date	: **08-Dec-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 13.8' C SYD
Receipt Detail	:	No. of samples received / analysed	: 5 / 5

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 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 direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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)
ES2243233-001	25-Nov-2022 00:00	1302_SW160_221125	✓
ES2243233-002	25-Nov-2022 00:00	1302_SW181_221125	✓
ES2243233-003	25-Nov-2022 00:00	1302_SW300_221125	✓
ES2243233-004	25-Nov-2022 00:00	1302_QC300_221125	✓
ES2243233-005	25-Nov-2022 00:00	1302_QC400_221125	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV) — Email

DERP ESDAT REPORTS

[redacted] — Email

[redacted]

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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2243233**	Page	: 1 of 5
Client	: [redacted]	Laboratory	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: NT_1302_PFASOMP	Date Samples Received	: 01-Dec-2022 08:30
Order number	: 60612561 / 4.1	Date Analysis Commenced	: 01-Dec-2022
C-O-C number	: ----	Issue Date	: 08-Dec-2022 08:39
Sampler	[redacted]		
Site	: ----		
Quote number	: SY/139/19 V3		
No. of samples received	: 5		
No. of samples analysed	: 5		

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*
[redacted]	[redacted]	[redacted]

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.
- 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: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW160_221125	1302_SW181_221125	1302_SW300_221125	1302_QC300_221125	1302_QC400_221125
				Sampling date / time	25-Nov-2022 00:00	25-Nov-2022 00:00	25-Nov-2022 00:00	25-Nov-2022 00:00	25-Nov-2022 00:00
					ES2243233-001	ES2243233-002	ES2243233-003	ES2243233-004	ES2243233-005
					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		**0.05**	<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		**0.26**	**0.03**	<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: WATER (Matrix: WATER)				Sample ID	1302_SW160_221125	1302_SW181_221125	1302_SW300_221125	1302_QC300_221125	1302_QC400_221125
				Sampling date / time	25-Nov-2022 00:00	25-Nov-2022 00:00	25-Nov-2022 00:00	25-Nov-2022 00:00	25-Nov-2022 00:00
Compound	CAS Number	LOR	Unit		ES2243233-001	ES2243233-002	ES2243233-003	ES2243233-004	ES2243233-005
					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		**0.31**	**0.03**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.31**	**0.03**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.31**	**0.03**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**112**	**95.2**	**92.7**	**101**	**93.0**
13C8-PFOA	----	0.02	%		**104**	**96.6**	**103**	**101**	**99.2**

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	[redacted]	Page	[redacted]
Client		Laboratory	
Contact		Contact	
Address		Address	
Telephone		Telephone	
Project		Date Samples Received	: 01-Dec-2022
Order number		Date Analysis Commenced	: 01-Dec-2022
C-O-C number		Issue Date	: 08-Dec-2022
Sampler			
Site			
Quote number			
No. of samples received	:		
No. of samples analysed	: 5		

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*
[redacted]		

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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4747532)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	92.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	92.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	82.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	115	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	94.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	86.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4747532)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	96.2	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	97.2	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	103	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	110	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	119	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	106	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	118	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4747532)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	116	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	96.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	124	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	108	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	115	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: 4747532)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	93.8	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	92.0	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	93.8	67.0	138

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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4747532) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	86.8	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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	[redacted]	Page	: 1 of 5
Client		Laboratory	[redacted]
Contact		Telephone	: +
Project		Date Samples Received	:
Site		Issue Date	: 08-Dec-2022
Sampler		No. of samples received	: 5
Order number	: 60612561 / 4.1	No. of samples analysed	: 5

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

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

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	0	19	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	19	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: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW160_221125, 1302_SW181_221125, 1302_SW300_221125, 1302_QC300_221125, 1302_QC400_221125	**25-Nov-2022**	**06-Dec-2022**	24-May-2023	✓	**08-Dec-2022**	24-May-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW160_221125, 1302_SW181_221125, 1302_SW300_221125, 1302_QC300_221125, 1302_QC400_221125	**25-Nov-2022**	**06-Dec-2022**	24-May-2023	✓	**08-Dec-2022**	24-May-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
1302_SW160_221125, 1302_SW181_221125, 1302_SW300_221125, 1302_QC300_221125, 1302_QC400_221125	**25-Nov-2022**	**06-Dec-2022**	24-May-2023	✓	**08-Dec-2022**	24-May-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW160_221125, 1302_SW181_221125, 1302_SW300_221125, 1302_QC300_221125, 1302_QC400_221125	**25-Nov-2022**	**06-Dec-2022**	24-May-2023	✓	**08-Dec-2022**	24-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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_SW160_221125, 1302_SW181_221125, 1302_SW300_221125, 1302_QC300_221125, 1302_QC400_221125	**25-Nov-2022**	**06-Dec-2022**	24-May-2023	✓	**08-Dec-2022**	24-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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	19	**0.00**	**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	0	19	**0.00**	**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
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.

ALS Environmental

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2246451**

Client	: [redacted]	Laboratory	[redacted]
Contact	:	Contact	
Address	:	Address	
E-mail	:	E-mail	
Telephone	:	Telephone	
Facsimile	:	Facsimile	
Project	:	Page	
Order number	:	Quote number	
C-O-C number	:	QC Level	
Site	:		
Sampler	:		

Dates

Date Samples Received	: 22-Dec-2022 08:57	Issue Date	: 10-Jan-2023
Client Requested Due Date	: 09-Jan-2023	Scheduled Reporting Date	: **09-Jan-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 10.1' C SYD
Receipt Detail	:	No. of samples received / analysed	: 6 / 6
		No. of samples NOT collected	1

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
- This is an updated SRN which indicates updating sample 3 ID to 1302_SW109_221222.
- **External QC on sample 1302_QC200_221222 will be conducted by NMI.**
- **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.**
- Sample 1302_QC500_221222 was not received due to the following reason: Sample not received
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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)
ES2246451-001	22-Dec-2022 00:00	1302_SW170_221222	✓
ES2246451-002	22-Dec-2022 00:00	1302_SW312_221222	✓
ES2246451-003	22-Dec-2022 00:00	1302_SW109_221222	✓
ES2246451-004	22-Dec-2022 00:00	1302_QC100_221222	✓
ES2246451-006	22-Dec-2022 00:00	1302_QC300_221222	✓
ES2246451-007	22-Dec-2022 00:00	1302_QC400_221222	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV) — Email

[redacted] — Email

[redacted] — Email
[redacted] — Email
[redacted] — Email

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	[redacted]	Page	[redacted]
Client		Laboratory	
Contact		Contact	
Address		Address	
Telephone		Telephone	
Project		Date Samples Received	: 22-Dec-2022 08:57
Order number		Date Analysis Commenced	: 28-Dec-2022
C-O-C number		Issue Date	: 10-Jan-2023 09:40
Sampler			
Site			
Quote number			
No. of samples received	: 7		
No. of samples analysed	: 6		

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*
[redacted]		

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.
- 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: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW170_221222	1302_SW312_221222	1302_SW109_221222	1302_QC100_221222	1302_QC300_221222
				Sampling date / time	22-Dec-2022 00:00	22-Dec-2022 00:00	22-Dec-2022 00:00	22-Dec-2022 00:00	22-Dec-2022 00:00
					ES2246451-001	ES2246451-002	ES2246451-003	ES2246451-004	ES2246451-006
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	**0.03**	**0.03**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	**0.03**	**0.03**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.04**	**0.08**	**0.25**	**0.27**	<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		**0.30**	**0.65**	**0.46**	**0.53**	<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	**0.05**	**0.06**	<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: WATER (Matrix: WATER)				Sample ID	1302_SW170_221222	1302_SW312_221222	1302_SW109_221222	1302_QC100_221222	1302_QC300_221222
				Sampling date / time	22-Dec-2022 00:00	22-Dec-2022 00:00	22-Dec-2022 00:00	22-Dec-2022 00:00	22-Dec-2022 00:00
Compound	CAS Number	LOR	Unit		ES2246451-001	ES2246451-002	ES2246451-003	ES2246451-004	ES2246451-006
					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		**0.34**	**0.73**	**0.83**	**0.93**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.34**	**0.73**	**0.71**	**0.80**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.34**	**0.73**	**0.80**	**0.90**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**93.1**	**96.3**	**103**	**96.2**
13C8-PFOA	----	0.02	%		**96.6**	**96.8**	**95.7**	**93.7**	**94.8**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC400_221222	----	----	----	----
				Sampling date / time	22-Dec-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2246451-007	--------	--------	--------	--------
					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: WATER (Matrix: WATER)				Sample ID	1302_QC400_221222	----	----	----	----
				Sampling date / time	22-Dec-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2246451-007	--------	--------	--------	--------
					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	%		**99.4**	----	----	----	----
13C8-PFOA	----	0.02	%		**95.2**	----	----	----	----

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

[redacted]

Client	[redacted]	Laboratory	: [redacted]
Contact		Contact	:
Address		Address	:
Telephone		Telephone	:
Project		Date Samples Received	: 22-Dec-2022
Order number		Date Analysis Commenced	: 28-Dec-2022
C-O-C number		Issue Date	: 10-Jan-2023
Sampler			
Site	:		
Quote number	: SY/139/19 V3		
No. of samples received	: 7		
No. of samples analysed	: 6		

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*
[redacted]		

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 (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4803965)									
ES2246236-004	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
ES2246619-001	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.32	0.33	5.2	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.25	0.24	0.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.06	0.06	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.05	0.05	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: 4803965)									
ES2246236-004	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

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: 4803965) - continued									
ES2246619-001	Anonymous	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.05	0.05	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.10	0.10	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	0.03	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: 4803965)									
ES2246236-004	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
ES2246619-001	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: 4803965)									
ES2246236-004	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

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: 4803965) - continued									
ES2246236-004	Anonymous	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
ES2246619-001	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: 4803965)									
ES2246236-004	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.01	0.01	0.0	No Limit
ES2246619-001	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.88	0.87	1.1	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: **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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4803965)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	88.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	97.4	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	84.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	95.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	81.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	84.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4803965)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	95.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	95.4	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	98.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	94.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	91.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	101	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	85.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	120	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4803965)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	102	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	116	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	100	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	92.6	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	111	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	119	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4803965)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	94.0	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	105	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

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: 4803965) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	95.4	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4803965)							
ES2246236-004	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	110	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	103	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	83.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	105	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	93.8	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	98.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4803965)							
ES2246236-004	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	93.5	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	114	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	120	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	113	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	100	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	96.8	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	97.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	102	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	89.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	92.2	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	119	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4803965)							
ES2246236-004	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	106	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	95.8	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	100	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	103	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	95.7	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	103	65.0	136

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: 4803965) - continued							
ES2246236-004	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	117	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4803965)							
ES2246236-004	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	96.6	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	111	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	115	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	98.6	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	[redacted]	Page	[redacted]
	[redacted]		[redacted]
Contact	[redacted]	Telephone	[redacted]
Project	[redacted]	Date Samples Received	: 22-Dec-2022
Site	[redacted]	Issue Date	: 10-Jan-2023
Sampler	[redacted]	No. of samples received	: 7
Order number	[redacted]	No. of samples analysed	: 6

This report is automatica[redacted]rough 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: **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)							
1302_SW170_221222, 1302_SW312_221222, 1302_SW109_221222, 1302_QC100_221222, 1302_QC300_221222, 1302_QC400_221222	**22-Dec-2022**	**09-Jan-2023**	20-Jun-2023	✓	**10-Jan-2023**	20-Jun-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW170_221222, 1302_SW312_221222, 1302_SW109_221222, 1302_QC100_221222, 1302_QC300_221222, 1302_QC400_221222	**22-Dec-2022**	**09-Jan-2023**	20-Jun-2023	✓	**10-Jan-2023**	20-Jun-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
1302_SW170_221222, 1302_SW312_221222, 1302_SW109_221222, 1302_QC100_221222, 1302_QC300_221222, 1302_QC400_221222	**22-Dec-2022**	**09-Jan-2023**	20-Jun-2023	✓	**10-Jan-2023**	20-Jun-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW170_221222, 1302_SW312_221222, 1302_SW109_221222, 1302_QC100_221222, 1302_QC300_221222, 1302_QC400_221222	**22-Dec-2022**	**09-Jan-2023**	20-Jun-2023	✓	**10-Jan-2023**	20-Jun-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_SW170_221222, 1302_SW312_221222, 1302_SW109_221222, 1302_QC100_221222, 1302_QC300_221222, 1302_QC400_221222	**22-Dec-2022**	**09-Jan-2023**	20-Jun-2023	✓	**10-Jan-2023**	20-Jun-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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	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
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	[redacted]		
Client		Laboratory	[redacted]
Contact		Contact	
Address		Address	
E-mail		E-mail	
Telephone		Telephone	
Facsimile		Facsimile	
Project		Page	
Order number		Quote number	
C-O-C number		QC Level	
Site			
Sampler			

Dates

Date Samples Received	: 04-Apr-2023 14:30	Issue Date	: 05-Apr-2023
Client Requested Due Date	: 12-Apr-2023	Scheduled Reporting Date	: **12-Apr-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 18.6'C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 47 / 47

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
- This is an updated SRN which indicates the addition of PFAS analyiss to sample 46 and 47.
- **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 direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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)
ES2310999-001	14-Mar-2023 00:00	1302_MW115_230314	✓
ES2310999-002	14-Mar-2023 00:00	1302_MW205_230314	✓
ES2310999-003	14-Mar-2023 00:00	1302_MW112_230314	✓
ES2310999-004	14-Mar-2023 00:00	1302_MW156_230314	✓
ES2310999-005	14-Mar-2023 00:00	1302_QC100_230314	✓
ES2310999-006	20-Mar-2023 00:00	1302_MW180_230320	✓
ES2310999-007	20-Mar-2023 00:00	1302_QC100_230320	✓
ES2310999-008	20-Mar-2023 00:00	1302_QC200_230320	✓
ES2310999-009	20-Mar-2023 00:00	1302_MW211_230320	✓
ES2310999-010	20-Mar-2023 00:00	1302_MW200_230320	✓
ES2310999-011	20-Mar-2023 00:00	1302_MW176_230320	✓
ES2310999-012	22-Mar-2023 00:00	1302_MW235_230322	✓
ES2310999-013	22-Mar-2023 00:00	1302_MW139_230322	✓
ES2310999-014	22-Mar-2023 00:00	1302_MW141_230322	✓
ES2310999-015	22-Mar-2023 00:00	1302_MW303_230322	✓
ES2310999-016	23-Mar-2023 00:00	1302_MW241_230323	✓
ES2310999-017	23-Mar-2023 00:00	1302_MW453_230323	✓
ES2310999-018	23-Mar-2023 00:00	1302_MW240_230323	✓
ES2310999-019	23-Mar-2023 00:00	1302_MW197_230323	✓
ES2310999-020	23-Mar-2023 00:00	1302_MW215_230323	✓
ES2310999-021	23-Mar-2023 00:00	1302_MW107_230323	✓
ES2310999-022	23-Mar-2023 00:00	1302_MW103_230323	✓
ES2310999-023	23-Mar-2023 00:00	1302_MW128_230323	✓
ES2310999-024	20-Mar-2023 00:00	1302_QC101_230320	✓
ES2310999-025	20-Mar-2023 00:00	1302_MW209_230320	✓
ES2310999-026	20-Mar-2023 00:00	1302_MW210_230320	✓
ES2310999-027	20-Mar-2023 00:00	1302_MW185_230320	✓
ES2310999-028	20-Mar-2023 00:00	1302_MW191_230320	✓
ES2310999-029	20-Mar-2023 00:00	1302_MW190_230320	✓
ES2310999-030	20-Mar-2023 00:00	1302_MW195_230320	✓
ES2310999-031	20-Mar-2023 00:00	1302_MW194_230320	✓
ES2310999-032	22-Mar-2023 00:00	1302_MW454_230322	✓
ES2310999-033	22-Mar-2023 00:00	1302_QC102_230322	✓
ES2310999-034	23-Mar-2023 00:00	1302_MW451_230323	✓
ES2310999-035	23-Mar-2023 00:00	1302_MW148_230323	✓

			WATER - EP231X PFAS - Full Suite (28 analytes)
ES2310999-036	23-Mar-2023 00:00	1302_MW452_230323	✓
ES2310999-037	20-Mar-2023 00:00	1302_QC300_230320	✓
ES2310999-038	20-Mar-2023 00:00	1302_QC400_230320	✓
ES2310999-039	22-Mar-2023 00:00	1302_QC301_230322	✓
ES2310999-040	22-Mar-2023 00:00	1302_QC401_230322	✓
ES2310999-041	23-Mar-2023 00:00	1302_QC302_230323	✓
ES2310999-042	23-Mar-2023 00:00	1302_QC402_230323	✓
ES2310999-043	23-Mar-2023 00:00	1302_QC500_230323	✓
ES2310999-044	14-Mar-2023 00:00	1302_QC303_230314	✓
ES2310999-045	14-Mar-2023 00:00	1302_QC403_230314	✓
ES2310999-046	15-Mar-2023 00:00	1302_MW133_230315	✓
ES2310999-047	14-Mar-2023 00:00	1302_MW297_230314	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

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

[redacted] — Email

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CERTIFICATE OF ANALYSIS

Work Order	[redacted]	Page	[redacted]
Client		Laboratory	
Contact		Contact	
Address		Address	
Telephone		Telephone	
Project		Date Samples Received	: 04-Apr-2023 14:30
Order number		Date Analysis Commenced	: 05-Apr-2023
C-O-C number		Issue Date	: 12-Apr-2023 14:07
Sampler			
Site			
Quote number			
No. of samples received	: 47		
No. of samples analysed	: 47		

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*
[redacted]		

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.
- Samples received extra, committed with no analysis.
- 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: WATER (Matrix: WATER)				Sample ID	1302_MW115_230314	1302_MW205_230314	1302_MW112_230314	1302_MW156_230314	1302_QC100_230314
				Sampling date / time	14-Mar-2023 00:00	14-Mar-2023 00:00	14-Mar-2023 00:00	14-Mar-2023 00:00	14-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-001	ES2310999-002	ES2310999-003	ES2310999-004	ES2310999-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**1.47**	**0.16**	**0.23**	**0.30**	**1.63**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**2.12**	**0.16**	**0.23**	**0.32**	**2.35**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**16.3**	**1.20**	**1.81**	**2.74**	**16.9**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**1.39**	**0.07**	**0.12**	**0.18**	**1.65**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**47.3**	**1.84**	**6.42**	**5.98**	**47.6**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		**0.06**	<0.02	<0.02	<0.02	**0.07**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**0.2**	<0.1	<0.1	<0.1	**0.2**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.56**	**0.05**	**0.11**	**0.14**	**0.63**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**3.16**	**0.24**	**0.60**	**0.64**	**3.51**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.34**	**0.03**	**0.07**	**0.07**	**0.38**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**1.01**	**0.07**	**0.15**	**0.16**	**1.14**
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		**0.10**	<0.02	<0.02	<0.02	**0.10**
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: WATER (Matrix: WATER)				Sample ID	1302_MW115_230314	1302_MW205_230314	1302_MW112_230314	1302_MW156_230314	1302_QC100_230314
				Sampling date / time	14-Mar-2023 00:00	14-Mar-2023 00:00	14-Mar-2023 00:00	14-Mar-2023 00:00	14-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-001	ES2310999-002	ES2310999-003	ES2310999-004	ES2310999-005
					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		**74.0**	**3.82**	**9.74**	**10.5**	**76.2**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**63.6**	**3.04**	**8.23**	**8.72**	**64.5**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**70.3**	**3.59**	**9.39**	**10.0**	**72.0**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.4**	**99.4**	**104**	**110**	**95.0**
13C8-PFOA	----	0.02	%		**102**	**102**	**104**	**100**	**98.5**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW180_230320	1302_QC100_230320	1302_MW211_230320	1302_MW200_230320	1302_MW176_230320
				Sampling date / time	20-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-006	ES2310999-007	ES2310999-009	ES2310999-010	ES2310999-011
					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	**0.03**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.08**	**0.09**	**0.01**	**0.30**	**0.04**
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**	**0.02**	**0.03**	**0.46**	**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		<0.1	<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	**0.03**	<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: WATER (Matrix: WATER)				Sample ID	1302_MW180_230320	1302_QC100_230320	1302_MW211_230320	1302_MW200_230320	1302_MW176_230320
				Sampling date / time	20-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-006	ES2310999-007	ES2310999-009	ES2310999-010	ES2310999-011
					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		**0.09**	**0.11**	**0.04**	**0.84**	**0.12**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.09**	**0.11**	**0.04**	**0.76**	**0.12**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.09**	**0.11**	**0.04**	**0.81**	**0.12**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**105**	**102**	**106**	**107**	**104**
13C8-PFOA	----	0.02	%		**103**	**102**	**105**	**104**	**103**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW235_230322	1302_MW139_230322	1302_MW141_230322	1302_MW303_230322	1302_MW241_230323
				Sampling date / time	22-Mar-2023 00:00	22-Mar-2023 00:00	22-Mar-2023 00:00	22-Mar-2023 00:00	23-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-012	ES2310999-013	ES2310999-014	ES2310999-015	ES2310999-016
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.69**	<0.02	<0.02	**3.01**	**0.81**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.83**	<0.02	<0.02	**4.16**	**0.60**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**7.06**	**0.14**	**0.20**	**28.1**	**5.40**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.52**	<0.02	<0.02	**2.05**	**0.43**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**25.6**	**0.42**	**0.25**	**26.8**	**21.6**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		**0.08**	<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	**0.7**	**1.2**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.42**	<0.02	<0.02	**1.32**	**2.32**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**1.83**	**0.03**	<0.02	**8.26**	**3.52**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.20**	<0.02	<0.02	**0.85**	**3.46**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.48**	<0.01	<0.01	**1.80**	**2.70**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.86**
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.10**
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		**0.04**	<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: WATER (Matrix: WATER)				Sample ID	1302_MW235_230322	1302_MW139_230322	1302_MW141_230322	1302_MW303_230322	1302_MW241_230323
				Sampling date / time	22-Mar-2023 00:00	22-Mar-2023 00:00	22-Mar-2023 00:00	22-Mar-2023 00:00	23-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-012	ES2310999-013	ES2310999-014	ES2310999-015	ES2310999-016
					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	**0.07**	**0.25**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	**1.41**
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		**37.8**	**0.59**	**0.45**	**77.1**	**44.7**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**32.7**	**0.56**	**0.45**	**54.9**	**27.0**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**36.4**	**0.59**	**0.45**	**70.9**	**42.7**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	**101**	**107**	**105**	**108**
13C8-PFOA	----	0.02	%		**101**	**101**	**103**	**104**	**97.3**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW453_230323	1302_MW240_230323	1302_MW197_230323	1302_MW215_230323	1302_MW107_230323
				Sampling date / time	23-Mar-2023 00:00	23-Mar-2023 00:00	23-Mar-2023 00:00	23-Mar-2023 00:00	23-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-017	ES2310999-018	ES2310999-019	ES2310999-020	ES2310999-021
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**1.35**	**1.05**	**0.14**	**0.20**	**0.25**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**1.37**	**1.15**	**0.21**	**0.28**	**0.32**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**7.35**	**6.88**	**2.31**	**3.02**	**3.18**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.37**	**0.48**	**0.12**	**0.24**	**0.31**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**5.26**	**17.8**	**4.89**	**6.30**	**8.66**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	**0.04**	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		**1.7**	**1.4**	<0.1	**0.2**	**0.3**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**2.75**	**2.18**	**0.08**	**0.75**	**1.09**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**6.07**	**4.52**	**0.47**	**0.74**	**1.12**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**4.07**	**2.94**	**0.06**	**0.12**	**0.16**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**3.42**	**2.85**	**0.12**	**0.15**	**0.22**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.35**	**0.93**	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	**0.17**	<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	**0.05**	<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: WATER (Matrix: WATER)				Sample ID	1302_MW453_230323	1302_MW240_230323	1302_MW197_230323	1302_MW215_230323	1302_MW107_230323
				Sampling date / time	23-Mar-2023 00:00	23-Mar-2023 00:00	23-Mar-2023 00:00	23-Mar-2023 00:00	23-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-017	ES2310999-018	ES2310999-019	ES2310999-020	ES2310999-021
					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		**0.53**	**0.38**	<0.05	**3.50**	**3.92**
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		**0.18**	**1.96**	<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		**34.8**	**44.8**	**8.40**	**15.5**	**19.5**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**12.6**	**24.7**	**7.20**	**9.32**	**11.8**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**32.7**	**42.0**	**8.07**	**15.0**	**18.9**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**104**	**107**	**103**	**113**	**117**
13C8-PFOA	----	0.02	%		**101**	**100**	**101**	**115**	**114**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW103_230323	1302_MW128_230323	1302_QC101_230320	1302_MW209_230320	1302_MW210_230320
				Sampling date / time	23-Mar-2023 00:00	23-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-022	ES2310999-023	ES2310999-024	ES2310999-025	ES2310999-026
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.21**	**0.11**	<0.02	<0.02	**0.03**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.26**	**0.13**	<0.02	<0.02	**0.04**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**3.21**	**1.29**	**0.05**	<0.01	**0.44**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.29**	**0.10**	<0.02	<0.02	**0.04**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**10.9**	**4.23**	**0.12**	<0.01	**1.47**
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		**0.2**	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**1.09**	**0.10**	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**1.14**	**0.28**	<0.02	<0.02	**0.06**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.16**	**0.04**	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.23**	**0.10**	<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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW103_230323	1302_MW128_230323	1302_QC101_230320	1302_MW209_230320	1302_MW210_230320
				Sampling date / time	23-Mar-2023 00:00	23-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-022	ES2310999-023	ES2310999-024	ES2310999-025	ES2310999-026
					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		**4.62**	**0.15**	<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		**22.3**	**6.53**	**0.17**	<0.01	**2.10**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**14.1**	**5.52**	**0.17**	<0.01	**1.91**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**21.8**	**6.30**	**0.17**	<0.01	**2.02**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**116**	**117**	**116**	**110**	**118**
13C8-PFOA	----	0.02	%		**115**	**119**	**111**	**113**	**114**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW185_230320	1302_MW191_230320	1302_MW190_230320	1302_MW195_230320	1302_MW194_230320
				Sampling date / time	20-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-027	ES2310999-028	ES2310999-029	ES2310999-030	ES2310999-031
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.06**	<0.02	**0.03**	**0.09**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.07**	<0.02	**0.03**	**0.10**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.01**	**0.78**	**0.13**	**0.35**	**1.09**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.04**	<0.02	**0.02**	**0.08**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.04**	**1.87**	**0.36**	**0.92**	**3.66**
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	**0.04**	<0.02	<0.02	**0.06**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.12**	**0.02**	**0.04**	**0.22**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.03**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.04**	**0.01**	**0.02**	**0.07**
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: WATER (Matrix: WATER)				Sample ID	1302_MW185_230320	1302_MW191_230320	1302_MW190_230320	1302_MW195_230320	1302_MW194_230320
				Sampling date / time	20-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00	20-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-027	ES2310999-028	ES2310999-029	ES2310999-030	ES2310999-031
					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		**0.05**	**3.02**	**0.52**	**1.41**	**5.40**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.05**	**2.65**	**0.49**	**1.27**	**4.75**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.05**	**2.91**	**0.52**	**1.36**	**5.22**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**117**	**114**	**114**	**111**	**106**
13C8-PFOA	----	0.02	%		**111**	**116**	**117**	**112**	**112**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW454_230322	1302_QC102_230322	1302_MW451_230323	1302_MW148_230323	1302_MW452_230323
				Sampling date / time	22-Mar-2023 00:00	22-Mar-2023 00:00	23-Mar-2023 00:00	23-Mar-2023 00:00	23-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-032	ES2310999-033	ES2310999-034	ES2310999-035	ES2310999-036
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**1.31**	**1.35**	**0.06**	**0.16**	**0.13**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**1.84**	**1.84**	**0.08**	**0.21**	**0.19**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**12.6**	**12.9**	**0.84**	**2.15**	**1.83**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**1.18**	**1.28**	**0.05**	**0.18**	**0.11**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**28.2**	**28.0**	**1.54**	**6.59**	**2.91**
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**	**0.3**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.50**	**0.53**	**0.03**	**0.06**	**0.23**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**2.15**	**2.23**	**0.09**	**0.23**	**0.39**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.23**	**0.25**	<0.02	**0.04**	**0.08**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.57**	**0.59**	**0.04**	**0.10**	**0.09**
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: WATER (Matrix: WATER)				Sample ID	1302_MW454_230322	1302_QC102_230322	1302_MW451_230323	1302_MW148_230323	1302_MW452_230323
				Sampling date / time	22-Mar-2023 00:00	22-Mar-2023 00:00	23-Mar-2023 00:00	23-Mar-2023 00:00	23-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-032	ES2310999-033	ES2310999-034	ES2310999-035	ES2310999-036
					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	**0.63**
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		**48.9**	**49.3**	**2.73**	**9.72**	**6.59**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**40.8**	**40.9**	**2.38**	**8.74**	**4.74**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**45.9**	**46.2**	**2.60**	**9.33**	**6.29**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**109**	**102**	**108**	**110**	**108**
13C8-PFOA	----	0.02	%		**113**	**112**	**110**	**110**	**109**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC300_230320	1302_QC400_230320	1302_QC301_230322	1302_QC401_230322	1302_QC302_230323
				Sampling date / time	20-Mar-2023 00:00	20-Mar-2023 00:00	22-Mar-2023 00:00	22-Mar-2023 00:00	23-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-037	ES2310999-038	ES2310999-039	ES2310999-040	ES2310999-041
					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: WATER (Matrix: WATER)				Sample ID	1302_QC300_230320	1302_QC400_230320	1302_QC301_230322	1302_QC401_230322	1302_QC302_230323
				Sampling date / time	20-Mar-2023 00:00	20-Mar-2023 00:00	22-Mar-2023 00:00	22-Mar-2023 00:00	23-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-037	ES2310999-038	ES2310999-039	ES2310999-040	ES2310999-041
					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	%		**103**	**110**	**115**	**114**	**117**
13C8-PFOA	----	0.02	%		**109**	**110**	**117**	**116**	**114**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC402_230323	1302_QC500_230323	1302_QC303_230314	1302_QC403_230314	1302_MW133_230315
				Sampling date / time	23-Mar-2023 00:00	23-Mar-2023 00:00	14-Mar-2023 00:00	14-Mar-2023 00:00	15-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-042	ES2310999-043	ES2310999-044	ES2310999-045	ES2310999-046
					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	**0.45**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.73**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**6.98**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.92**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**30.4**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.10**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	**0.2**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.39**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**1.92**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.21**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.56**
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	**0.06**
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: WATER (Matrix: WATER)				Sample ID	1302_QC402_230323	1302_QC500_230323	1302_QC303_230314	1302_QC403_230314	1302_MW133_230315
				Sampling date / time	23-Mar-2023 00:00	23-Mar-2023 00:00	14-Mar-2023 00:00	14-Mar-2023 00:00	15-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2310999-042	ES2310999-043	ES2310999-044	ES2310999-045	ES2310999-046
					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	**42.9**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**37.4**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**41.1**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**111**	**117**	**109**	**110**	**103**
13C8-PFOA	----	0.02	%		**114**	**113**	**111**	**114**	**110**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW297_230314	----	----	----	----
				Sampling date / time	14-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2310999-047	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.05**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.07**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.70**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.03**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.32**	----	----	----	----
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		**0.03**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.16**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.02**	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.05**	----	----	----	----
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: WATER (Matrix: WATER)				Sample ID	1302_MW297_230314	----	----	----	----
				Sampling date / time	14-Mar-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2310999-047	--------	--------	--------	--------
					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		**2.43**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**2.02**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**2.33**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**109**	----	----	----	----
13C8-PFOA	----	0.02	%		**115**	----	----	----	----

Surrogate Control Limits

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

QUALITY CONTROL REPORT

Work Order	[redacted]	Page	[redacted]
Client		Laboratory	
Contact		Contact	
Address		Address	
Telephone		Telephone	
Project		Date Samples Received	: 04-Apr-2023
Order number		Date Analysis Commenced	: 05-Apr-2023
C-O-C number		Issue Date	: 12-Apr-2023
Sampler			
Site			
Quote number			
No. of samples received	: 47		
No. of samples analysed	: 47		

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 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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4978326)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	79.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	86.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	85.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	84.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	91.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	84.4	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4978336)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	79.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	90.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	91.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	110	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	96.9	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	112	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4980974)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	94.8	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	111	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	111	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	108	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	109	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4978326)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	82.0	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	90.6	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	92.2	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	89.4	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	92.2	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	90.6	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	94.0	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4978326) - continued								
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	84.2	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4978336)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	86.4	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	93.9	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	89.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	82.5	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	95.7	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	90.2	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	77.4	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	112	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	78.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	127	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4980974)								
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	112	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	102	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	121	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	91.8	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	91.1	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	128	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	120	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	90.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	121	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4978326)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	87.8	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	106	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	95.7	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	98.9	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	97.8	57.6	145

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: 4978326) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	88.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	98.2	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4978336)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	117	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	83.3	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	73.3	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.4	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	82.0	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	124	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	106	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4980974)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	121	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	106	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	81.2	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	99.7	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	83.5	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	125	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4978326)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	89.8	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	90.4	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	113	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	105	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4978336)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	91.9	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	98.8	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	95.1	67.0	138

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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4978336) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	106	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4980974)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	106	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	112	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	81.5	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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Com liance Assessment to assist with Q

Work Order	[redacted]	Page	: 1 of 8
Project	[redacted]	Date Samples Received	: 04-Apr-2023
Site		Issue Date	: 12-Apr-2023
Sampler		No. of samples received	: 47
Order number		No. of samples analysed	: 47

This report is automa tation 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

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

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	0	46	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	46	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: Date extracted	Due for extraction	Evaluation	Analysis: Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1302_MW115_230314, 1302_MW205_230314, 1302_MW112_230314, 1302_MW156_230314, 1302_QC100_230314, 1302_QC303_230314, 1302_QC403_230314, 1302_MW297_230314	**14-Mar-2023**	**11-Apr-2023**	10-Sep-2023	✓	**12-Apr-2023**	10-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW133_230315	**15-Mar-2023**	**11-Apr-2023**	11-Sep-2023	✓	**12-Apr-2023**	11-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW180_230320, 1302_QC100_230320, 1302_MW211_230320, 1302_MW200_230320, 1302_MW176_230320, 1302_QC101_230320, 1302_MW209_230320, 1302_MW210_230320, 1302_MW185_230320, 1302_MW191_230320, 1302_MW190_230320, 1302_MW195_230320, 1302_MW194_230320, 1302_QC300_230320, 1302_QC400_230320	**20-Mar-2023**	**11-Apr-2023**	16-Sep-2023	✓	**12-Apr-2023**	16-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW235_230322, 1302_MW139_230322, 1302_MW141_230322, 1302_MW303_230322, 1302_MW454_230322, 1302_QC102_230322, 1302_QC301_230322, 1302_QC401_230322	**22-Mar-2023**	**11-Apr-2023**	18-Sep-2023	✓	**12-Apr-2023**	18-Sep-2023	✓
HDPE (no PTFE) (EP231X)							

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 - Continued							
1302_MW241_230323, 1302_MW453_230323, 1302_MW240_230323, 1302_MW197_230323, 1302_MW215_230323, 1302_MW107_230323, 1302_MW103_230323, 1302_MW128_230323, 1302_MW451_230323, 1302_MW148_230323, 1302_MW452_230323, 1302_QC302_230323, 1302_QC402_230323, 1302_QC500_230323	**23-Mar-2023**	**11-Apr-2023**	19-Sep-2023	✓	**12-Apr-2023**	19-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 1302_MW115_230314, 1302_MW205_230314, 1302_MW112_230314, 1302_MW156_230314, 1302_QC100_230314, 1302_QC303_230314, 1302_QC403_230314, 1302_MW297_230314	**14-Mar-2023**	**11-Apr-2023**	10-Sep-2023	✓	**12-Apr-2023**	10-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW133_230315	**15-Mar-2023**	**11-Apr-2023**	11-Sep-2023	✓	**12-Apr-2023**	11-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW180_230320, 1302_QC100_230320, 1302_MW211_230320, 1302_MW200_230320, 1302_MW176_230320, 1302_QC101_230320, 1302_MW209_230320, 1302_MW210_230320, 1302_MW185_230320, 1302_MW191_230320, 1302_MW190_230320, 1302_MW195_230320, 1302_MW194_230320, 1302_QC300_230320, 1302_QC400_230320	**20-Mar-2023**	**11-Apr-2023**	16-Sep-2023	✓	**12-Apr-2023**	16-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW235_230322, 1302_MW139_230322, 1302_MW141_230322, 1302_MW303_230322, 1302_MW454_230322, 1302_QC102_230322, 1302_QC301_230322, 1302_QC401_230322	**22-Mar-2023**	**11-Apr-2023**	18-Sep-2023	✓	**12-Apr-2023**	18-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW241_230323, 1302_MW453_230323, 1302_MW240_230323, 1302_MW197_230323, 1302_MW215_230323, 1302_MW107_230323, 1302_MW103_230323, 1302_MW128_230323, 1302_MW451_230323, 1302_MW148_230323, 1302_MW452_230323, 1302_QC302_230323, 1302_QC402_230323, 1302_QC500_230323	**23-Mar-2023**	**11-Apr-2023**	19-Sep-2023	✓	**12-Apr-2023**	19-Sep-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) 1302_MW115_230314, 1302_MW205_230314, 1302_MW112_230314, 1302_MW156_230314, 1302_QC100_230314, 1302_QC303_230314, 1302_QC403_230314, 1302_MW297_230314	**14-Mar-2023**	**11-Apr-2023**	10-Sep-2023	✓	**12-Apr-2023**	10-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW133_230315	**15-Mar-2023**	**11-Apr-2023**	11-Sep-2023	✓	**12-Apr-2023**	11-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW180_230320, 1302_QC100_230320, 1302_MW211_230320, 1302_MW200_230320, 1302_MW176_230320, 1302_QC101_230320, 1302_MW209_230320, 1302_MW210_230320, 1302_MW185_230320, 1302_MW191_230320, 1302_MW190_230320, 1302_MW195_230320, 1302_MW194_230320, 1302_QC300_230320, 1302_QC400_230320	**20-Mar-2023**	**11-Apr-2023**	16-Sep-2023	✓	**12-Apr-2023**	16-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW235_230322, 1302_MW139_230322, 1302_MW141_230322, 1302_MW303_230322, 1302_MW454_230322, 1302_QC102_230322, 1302_QC301_230322, 1302_QC401_230322	**22-Mar-2023**	**11-Apr-2023**	18-Sep-2023	✓	**12-Apr-2023**	18-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW241_230323, 1302_MW453_230323, 1302_MW240_230323, 1302_MW197_230323, 1302_MW215_230323, 1302_MW107_230323, 1302_MW103_230323, 1302_MW128_230323, 1302_MW451_230323, 1302_MW148_230323, 1302_MW452_230323, 1302_QC302_230323, 1302_QC402_230323, 1302_QC500_230323	**23-Mar-2023**	**11-Apr-2023**	19-Sep-2023	✓	**12-Apr-2023**	19-Sep-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) 1302_MW115_230314, 1302_MW205_230314, 1302_MW112_230314, 1302_MW156_230314, 1302_QC100_230314, 1302_QC303_230314, 1302_QC403_230314, 1302_MW297_230314	**14-Mar-2023**	**11-Apr-2023**	10-Sep-2023	✓	**12-Apr-2023**	10-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW133_230315	**15-Mar-2023**	**11-Apr-2023**	11-Sep-2023	✓	**12-Apr-2023**	11-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW180_230320, 1302_QC100_230320, 1302_MW211_230320, 1302_MW200_230320, 1302_MW176_230320, 1302_QC101_230320, 1302_MW209_230320, 1302_MW210_230320, 1302_MW185_230320, 1302_MW191_230320, 1302_MW190_230320, 1302_MW195_230320, 1302_MW194_230320, 1302_QC300_230320, 1302_QC400_230320	**20-Mar-2023**	**11-Apr-2023**	16-Sep-2023	✓	**12-Apr-2023**	16-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW235_230322, 1302_MW139_230322, 1302_MW141_230322, 1302_MW303_230322, 1302_MW454_230322, 1302_QC102_230322, 1302_QC301_230322, 1302_QC401_230322	**22-Mar-2023**	**11-Apr-2023**	18-Sep-2023	✓	**12-Apr-2023**	18-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW241_230323, 1302_MW453_230323, 1302_MW240_230323, 1302_MW197_230323, 1302_MW215_230323, 1302_MW107_230323, 1302_MW103_230323, 1302_MW128_230323, 1302_MW451_230323, 1302_MW148_230323, 1302_MW452_230323, 1302_QC302_230323, 1302_QC402_230323, 1302_QC500_230323	**23-Mar-2023**	**11-Apr-2023**	19-Sep-2023	✓	**12-Apr-2023**	19-Sep-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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 1302_MW115_230314, 1302_MW205_230314, 1302_MW112_230314, 1302_MW156_230314, 1302_QC100_230314, 1302_QC303_230314, 1302_QC403_230314, 1302_MW297_230314	**14-Mar-2023**	**11-Apr-2023**	10-Sep-2023	✓	**12-Apr-2023**	10-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW133_230315	**15-Mar-2023**	**11-Apr-2023**	11-Sep-2023	✓	**12-Apr-2023**	11-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW180_230320, 1302_QC100_230320, 1302_MW211_230320, 1302_MW200_230320, 1302_MW176_230320, 1302_QC101_230320, 1302_MW209_230320, 1302_MW210_230320, 1302_MW185_230320, 1302_MW191_230320, 1302_MW190_230320, 1302_MW195_230320, 1302_MW194_230320, 1302_QC300_230320, 1302_QC400_230320	**20-Mar-2023**	**11-Apr-2023**	16-Sep-2023	✓	**12-Apr-2023**	16-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW235_230322, 1302_MW139_230322, 1302_MW141_230322, 1302_MW303_230322, 1302_MW454_230322, 1302_QC102_230322, 1302_QC301_230322, 1302_QC401_230322	**22-Mar-2023**	**11-Apr-2023**	18-Sep-2023	✓	**12-Apr-2023**	18-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_MW241_230323, 1302_MW453_230323, 1302_MW240_230323, 1302_MW197_230323, 1302_MW215_230323, 1302_MW107_230323, 1302_MW103_230323, 1302_MW128_230323, 1302_MW451_230323, 1302_MW148_230323, 1302_MW452_230323, 1302_QC302_230323, 1302_QC402_230323, 1302_QC500_230323	**23-Mar-2023**	**11-Apr-2023**	19-Sep-2023	✓	**12-Apr-2023**	19-Sep-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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	46	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	46	**6.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	46	**6.52**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	46	**0.00**	**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
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.

TIFICATION (SRN)

[redacted]

Work Order	:		
Client	:	boratory	
Contact	:	ntact	
Address	:	dress	
E-mail	:	mail	
Telephone	:	lephone	
Facsimile	:	csimile	
Project	:	ge	
Order number	:	uote number	
C-O-C number	:	C Level	
Site	:		
Sampler	:		

Dates

Date Samples Received	: 21-Apr-2023 08:30	Issue Date	: 21-Apr-2023
Client Requested Due Date	: 28-Apr-2023	Scheduled Reporting Date	: **28-Apr-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: 15.4'C
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 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.**
- **QC Forward analysis will be conducted by NMI.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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)
ES2312996-001	20-Apr-2023 00:00	1302_MW144_230420	✓
ES2312996-002	20-Apr-2023 00:00	1302_QC100_230120	✓
ES2312996-003	20-Apr-2023 00:00	1302_QC500_230420	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV) — Email

[redacted] — Email

[redacted] — Email

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[redacted] — Email
[redacted] — Email
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CERTIFICATE OF ANALYSIS

Work Order	: **ES2312996**	Page	: 1 of 5
Client	[redacted]		
		Date Analysis Commenced	: 24-Apr-2023
C-O-C number	: ----	Issue Date	: 28-Apr-2023 11:46
Sampler	[redacted]		
Site	: ----		
Quote number	: SY/139/19 V3		
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*
[redacted]	[redacted]	

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.
- 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: WATER (Matrix: WATER)				Sample ID	1302_MW144_230420	1302_QC100_230120	1302_QC500_230420	----	----
				Sampling date / time	20-Apr-2023 00:00	20-Apr-2023 00:00	20-Apr-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2312996-001	ES2312996-002	ES2312996-003	--------	--------
					Result	Result	Result	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.20**	**0.19**	<0.02	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.21**	**0.21**	<0.02	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.62**	**1.61**	<0.01	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.10**	**0.10**	<0.02	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**2.13**	**1.98**	<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		**0.04**	**0.04**	<0.02	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.23**	**0.22**	<0.02	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.03**	**0.03**	<0.02	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.06**	**0.06**	<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	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_MW144_230420	1302_QC100_230120	1302_QC500_230420	----	----
				Sampling date / time	20-Apr-2023 00:00	20-Apr-2023 00:00	20-Apr-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2312996-001	ES2312996-002	ES2312996-003	--------	--------
					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	----	----
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	----	----
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		**4.62**	**4.44**	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**3.75**	**3.59**	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**4.31**	**4.13**	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.3**	**93.6**	**98.9**	----	----
13C8-PFOA	----	0.02	%		**96.9**	**95.9**	**99.0**	----	----

Surrogate Control Limits

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

QUALITY CONTROL REPORT

Work Order	[redacted]	Page	[redacted]
Client	[redacted]	Laboratory	[redacted]
Telephone	[redacted]	Telephone	: [redacted]
Project	[redacted]	Date Samples Received	: 21-Apr-2023
Order number	[redacted]	Date Analysis Commenced	: 24-Apr-2023
C-O-C number	[redacted]	Issue Date	: 28-Apr-2023
Sampler	[redacted]		
Site	: ----		
Quote number	: SY/139/19 V3		
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*
[redacted]		

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 (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5008277)									
ES2312996-003	1302_QC500_230420	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
ES2313050-017	Anonymous	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.17	0.13	21.9	0% - 50%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.37	0.35	6.3	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
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5008277)									
ES2312996-003	1302_QC500_230420	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

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: 5008277) - continued									
ES2313050-017	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	0.03	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: 5008277)									
ES2312996-003	1302_QC500_230420	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
ES2313050-017	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: 5008277)									
ES2312996-003	1302_QC500_230420	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	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: 5008277) - continued									
ES2312996-003	1302_QC500_230420	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
ES2313050-017	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: 5008277)									
ES2312996-003	1302_QC500_230420	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
ES2313050-017	Anonymous	EP231X: Sum of PFAS	----	0.01	µg/L	0.57	0.50	13.1	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: **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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5008277)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	89.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	109	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	102	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	111	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	95.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	95.2	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5008277)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	98.9	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	102	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	95.8	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	94.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	98.6	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	107	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	107	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5008277)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	95.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	98.8	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	85.9	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.7	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	106	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	103	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5008277)								

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: 5008277) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	104	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	107	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	110	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	90.2	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**

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: 5008277)							
ES2313050-013	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	108	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	95.8	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	95.4	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	93.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5008277)							
ES2313050-013	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	101	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	104	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	104	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	105	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	109	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	107	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	97.8	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	97.6	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	109	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5008277)							
ES2313050-013	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	102	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	98.2	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	84.1	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	94.8	66.0	145

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: 5008277) - continued							
ES2313050-013	Anonymous	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	107	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	110	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	102	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5008277)							
ES2313050-013	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	119	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	118	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	117	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	93.4	71.4	144

QA/QC Compliance Assessment to assist with Quality Review

Work Order [redacted]

[redacted]

No. of samples received : 3

Order number : 60612561 / 4.1

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: **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) 1302_MW144_230420, 1302_QC100_230120, 1302_QC500_230420	**20-Apr-2023**	**26-Apr-2023**	17-Oct-2023	✓	**28-Apr-2023**	17-Oct-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 1302_MW144_230420, 1302_QC100_230120, 1302_QC500_230420	**20-Apr-2023**	**26-Apr-2023**	17-Oct-2023	✓	**28-Apr-2023**	17-Oct-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 1302_MW144_230420, 1302_QC100_230120, 1302_QC500_230420	**20-Apr-2023**	**26-Apr-2023**	17-Oct-2023	✓	**28-Apr-2023**	17-Oct-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1302_MW144_230420, 1302_QC100_230120, 1302_QC500_230420	**20-Apr-2023**	**26-Apr-2023**	17-Oct-2023	✓	**28-Apr-2023**	17-Oct-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 1302_MW144_230420, 1302_QC100_230120, 1302_QC500_230420	**20-Apr-2023**	**26-Apr-2023**	17-Oct-2023	✓	**28-Apr-2023**	17-Oct-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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	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
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.

Australian Government
Department of Industry, Science and Resources

National Measurement Institute

SAMPLE RECEIPT NOTIFICATION

CUSTOME [redacted]

[redacted]

Email: [redacted]

Telephone:

Telephone:

Fax:

Fax:

SAMPLE DETAILS

NMI Job Name: AECO09/230201

Total No. of Samples: 1

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N23/001719	8-FEB-2023	1302_QC200_230125	WATER 25/01/23

[redacted]

SAMPLE RECEIVED CONDITION

Date samples received:	1-FEB-2023
Sample received in good order:	Yes
NMI Quotation no. provided:	
Client purchase order number:	60612561_4_1
Temperature of samples:	Chilled
Comments:	ALL OK
Mode of Delivery:	Courier

Additional Terms and Conditions

Incomplete / unclear information about samples or required testing will delay the start of the analysis work.

If you require your Purchase Order (PO) number to be included on our invoice, please provide the number during sample submission and before the completion of work to avoid unnecessary delays and/or additional processing/handling fees.

The lodgement of an order or receipt of samples for NMI services referenced in this Sample Receipt Notification constitutes an acceptence of the current version of NMI Terms and Conditions or other applicable Terms referenced in the NMI Quotation. NMI Terms and Conditions are available on the web at https://www.industry.gov.au/client-services/testing-and-analysis-services/chemical-and-biological-analysis-services-terms-and-conditions

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	[redacted]	Page	[redacted]
	[redacted]		
	[redacted]		
	[redacted]		
No. of samples received	: 8		
No. of samples analysed	: 8		

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*
[redacted]	[redacted]	

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.
- 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: **WATER**
(Matrix: **WATER**)

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW300_230125	1302_SW109_230125	1302_SW312_230125	1302_SW170_230125	1302_QC100_230125
				Sampling date / time	25-Jan-2023 00:00	25-Jan-2023 00:00	25-Jan-2023 00:00	25-Jan-2023 00:00	25-Jan-2023 00:00
					ES2302423-001	ES2302423-002	ES2302423-003	ES2302423-004	ES2302423-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.22**	**0.03**	**0.03**	<0.02	**0.20**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.18**	**0.04**	**0.03**	<0.02	**0.18**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.93**	**0.34**	**0.22**	**0.12**	**0.95**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.04**	<0.02	**0.02**	<0.02	**0.04**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.71**	**0.57**	**1.58**	**0.36**	**0.77**
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		**0.2**	<0.1	<0.1	<0.1	**0.2**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.29**	<0.02	<0.02	<0.02	**0.30**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.42**	**0.06**	**0.08**	**0.02**	**0.41**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.25**	<0.02	<0.02	<0.02	**0.25**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.25**	**0.02**	**0.02**	<0.01	**0.26**
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.02**	<0.02	<0.02	<0.02	**0.03**
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: WATER (Matrix: WATER)				Sample ID	1302_SW300_230125	1302_SW109_230125	1302_SW312_230125	1302_SW170_230125	1302_QC100_230125
				Sampling date / time	25-Jan-2023 00:00	25-Jan-2023 00:00	25-Jan-2023 00:00	25-Jan-2023 00:00	25-Jan-2023 00:00
Compound	CAS Number	LOR	Unit		ES2302423-001	ES2302423-002	ES2302423-003	ES2302423-004	ES2302423-005
					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		**3.51**	**1.06**	**1.98**	**0.50**	**3.59**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**1.64**	**0.91**	**1.80**	**0.48**	**1.72**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**3.27**	**1.02**	**1.93**	**0.50**	**3.34**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.7**	**97.8**	**96.7**	**103**	**98.0**
13C8-PFOA	----	0.02	%		**102**	**101**	**103**	**102**	**99.8**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC300_230125	1302_QC400_230125	1302_QC500_230125	----	----
				Sampling date / time	25-Jan-2023 00:00	25-Jan-2023 00:00	25-Jan-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2302423-007	ES2302423-008	ES2302423-009	--------	--------
					Result	Result	Result	----	----
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	----	----
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	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC300_230125	1302_QC400_230125	1302_QC500_230125	----	----
				Sampling date / time	25-Jan-2023 00:00	25-Jan-2023 00:00	25-Jan-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2302423-007	ES2302423-008	ES2302423-009	--------	--------
					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	----	----
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	----	----
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	%		**97.5**	**90.7**	**92.5**	----	----
13C8-PFOA	----	0.02	%		**101**	**100**	**102**	----	----

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPOR[redacted]

[redacted]

Project		Date Samples Received	: 01-Feb-2023
Order number		Date Analysis Commenced	: 01-Feb-2023
C-O-C number		Issue Date	: 07-Feb-2023
Sampler			
Site			
Quote number			
No. of samples received			
No. of samples analysed	: 8		

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*
[redacted]		

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 (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4851833)									
ES2302423-001	1302_SW300_230125	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.93	1.03	10.5	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.71	0.70	1.8	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.22	0.21	0.0	0% - 50%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.18	0.20	8.5	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	0.04	0.04	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
ES2302423-002	1302_SW109_230125	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.34	0.35	0.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	0.57	0.56	0.0	0% - 20%
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	0.03	0.03	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	0.04	0.04	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: 4851833)									
ES2302423-001	1302_SW300_230125	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.25	0.26	0.0	0% - 20%
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	0.29	0.31	6.4	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	0.42	0.42	0.0	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	0.25	0.25	0.0	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	0.2	0.2	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: 4851833) - continued									
ES2302423-002	1302_SW109_230125	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	0.02	0.02	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	0.06	0.06	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: 4851833)									
ES2302423-001	1302_SW300_230125	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
ES2302423-002	1302_SW109_230125	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: 4851833)									
ES2302423-001	1302_SW300_230125	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	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: 4851833) - continued									
ES2302423-001	1302_SW300_230125	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
ES2302423-002	1302_SW109_230125	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: 4851833)									
ES2302423-001	1302_SW300_230125	EP231X: Sum of PFAS	----	0.01	µg/L	3.51	3.64	3.6	0% - 20%
ES2302423-002	1302_SW109_230125	EP231X: Sum of PFAS	----	0.01	µg/L	1.06	1.06	0.0	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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4851833)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	77.0	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	85.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	81.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	78.4	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	77.0	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	79.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4851833)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	82.1	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	82.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	85.2	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	86.8	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	82.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	82.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	84.2	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	94.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	79.4	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	85.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4851833)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	82.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	93.4	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	72.5	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	82.2	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	84.8	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	81.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	77.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4851833)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	87.2	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	83.0	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	92.0	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: 4851833) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.25 µg/L	84.2	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**

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: 4851833)							
ES2302423-002	1302_SW109_230125	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	73.0	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.25 µg/L	77.8	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.25 µg/L	77.4	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.25 µg/L	77.2	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.25 µg/L	78.0	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	76.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4851833)							
ES2302423-002	1302_SW109_230125	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	82.2	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	102	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	79.0	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	85.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	83.0	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	82.0	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	81.6	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	78.8	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	94.2	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	80.4	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	80.2	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4851833)							
ES2302423-002	1302_SW109_230125	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	88.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	93.8	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	75.8	62.6	147
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	92.9	66.0	145
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	84.4	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	76.2	65.0	136

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: 4851833) - continued							
ES2302423-002	1302_SW109_230125	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	78.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4851833)							
ES2302423-002	1302_SW109_230125	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.25 µg/L	88.4	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.25 µg/L	88.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	91.2	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	82.8	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	[redacted]	Page	[redacted]
Project	[redacted]	Date Samples Received	: 01-Feb-2023
Site	[redacted]	Issue Date	: 07-Feb-2023
Sampler	[redacted]	No. of samples received	: 8
Order number	[redacted]	No. of samples analysed	: 8

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: **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)							
1302_SW300_230125, 1302_SW109_230125, 1302_SW312_230125, 1302_SW170_230125, 1302_QC100_230125, 1302_QC300_230125, 1302_QC400_230125, 1302_QC500_230125	**25-Jan-2023**	**06-Feb-2023**	24-Jul-2023	✓	**07-Feb-2023**	24-Jul-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW300_230125, 1302_SW109_230125, 1302_SW312_230125, 1302_SW170_230125, 1302_QC100_230125, 1302_QC300_230125, 1302_QC400_230125, 1302_QC500_230125	**25-Jan-2023**	**06-Feb-2023**	24-Jul-2023	✓	**07-Feb-2023**	24-Jul-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
1302_SW300_230125, 1302_SW109_230125, 1302_SW312_230125, 1302_SW170_230125, 1302_QC100_230125, 1302_QC300_230125, 1302_QC400_230125, 1302_QC500_230125	**25-Jan-2023**	**06-Feb-2023**	24-Jul-2023	✓	**07-Feb-2023**	24-Jul-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW300_230125, 1302_SW109_230125, 1302_SW312_230125, 1302_SW170_230125, 1302_QC100_230125, 1302_QC300_230125, 1302_QC400_230125, 1302_QC500_230125	**25-Jan-2023**	**06-Feb-2023**	24-Jul-2023	✓	**07-Feb-2023**	24-Jul-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
1302_SW300_230125, 1302_SW109_230125, 1302_SW312_230125, 1302_SW170_230125, 1302_QC100_230125, 1302_QC300_230125, 1302_QC400_230125, 1302_QC500_230125	**25-Jan-2023**	**06-Feb-2023**	24-Jul-2023	✓	**07-Feb-2023**	24-Jul-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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**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
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.

ALS Environmental

[redacted] PT NOTIFICATION (SRN)

Work Order
Amendment

Client : [redacted]

Laboratory : [redacted]

Sampler : [redacted]

Dates

Date Samples Received	: 24-Feb-2023 08:30	Issue Date	: 03-Mar-2023
Client Requested Due Date	: 03-Mar-2023	Scheduled Reporting Date	: **03-Mar-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: 6.3' C SYD
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

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
- **27/02/2023: This is an updated SRN which indicates the Project code, sample id's has been amended as per email from Tiane McQuire on 24/02/23.**
- **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.**
- **QC Forward analysis will be conducted on QC200 by NMI.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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 - EP231X-INJ PFAS - Full Suite (28 analytes)
ES2305982-001	23-Feb-2023 08:31	1302_SW109_230221	✓	
ES2305982-002	21-Feb-2023 08:33	1302_SW170_230221	✓	
ES2305982-003	21-Feb-2023 08:34	1302_SW312_230221	✓	
ES2305982-004	21-Feb-2023 08:35	1302_SW300_230221	✓	
ES2305982-005	21-Feb-2023 08:37	1302_QC100_230221	✓	
ES2305982-007	21-Feb-2023 08:45	1302_QC300_230221	✓	
ES2305982-008	21-Feb-2023 08:46	1302_QC400_230221	✓	
ES2305982-009	21-Feb-2023 08:47	1302_QC500_230221		✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

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

[redacted] — Email

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ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	[redacted]	Page	[redacted]
Client		Laboratory	
Contact		Contact	
Address		Address	
Telephone		Telephone	
Project		Date Samples Received	
Order number		Date Analysis Commenced	
C-O-C number		Issue Date	
Sampler			
Site			
Quote number			
No. of samples received			
No. of samples analysed			

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*
[redacted]		

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.
- 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.
- EP231X-INJ: The direct injection LCMSMS method may be used where the sample matrix is not suitable for Solid Phase Extraction (e.g. significant particulate load) or where only a single sample container is received.

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW109 _230221	1302_SW170 _230221	1302_SW312 _230221	1302_SW300 _230221	1302_QC100_230221
				Sampling date / time	23-Feb-2023 08:31	21-Feb-2023 08:33	21-Feb-2023 08:34	21-Feb-2023 08:35	21-Feb-2023 08:37
					ES2305982-001	ES2305982-002	ES2305982-003	ES2305982-004	ES2305982-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	**0.09**	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	**0.08**	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.10**	**0.03**	**0.52**	**0.09**	**0.11**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	**0.06**	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.26**	**0.09**	**1.71**	**0.15**	**0.26**
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	**0.06**	**0.03**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.03**	<0.02	**0.22**	**0.05**	**0.03**
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		**0.02**	<0.01	**0.04**	**0.02**	**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

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	1302_SW109 _230221	1302_SW170 _230221	1302_SW312 _230221	1302_SW300 _230221	1302_QC100_230221
				Sampling date / time	23-Feb-2023 08:31	21-Feb-2023 08:33	21-Feb-2023 08:34	21-Feb-2023 08:35	21-Feb-2023 08:37
					ES2305982-001	ES2305982-002	ES2305982-003	ES2305982-004	ES2305982-005
					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		**0.41**	**0.12**	**2.78**	**0.36**	**0.42**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.36**	**0.12**	**2.23**	**0.24**	**0.37**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.41**	**0.12**	**2.64**	**0.36**	**0.42**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.0**	**104**	**102**	**101**	**101**
13C8-PFOA	----	0.02	%		**102**	**101**	**101**	**100**	**105**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC300 _230221	1302_QC400 _230221	1302_QC500 _230221	----	----
				Sampling date / time	21-Feb-2023 08:45	21-Feb-2023 08:46	21-Feb-2023 08:47	----	----
Compound	CAS Number	LOR	Unit		ES2305982-007	ES2305982-008	ES2305982-009	--------	--------
					Result	Result	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	----	----
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	0.10	µg/L		----	----	<0.10	----	----
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	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC300 _230221	1302_QC400 _230221	1302_QC500 _230221	----	----
				Sampling date / time	21-Feb-2023 08:45	21-Feb-2023 08:46	21-Feb-2023 08:47	----	----
Compound	CAS Number	LOR	Unit		ES2305982-007	ES2305982-008	ES2305982-009	--------	--------
					Result	Result	Result	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		----	----	<0.02	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		----	----	<0.05	----	----
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	----	----	----
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	----	----
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	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC300 _230221	1302_QC400 _230221	1302_QC500 _230221	----	----
				Sampling date / time	21-Feb-2023 08:45	21-Feb-2023 08:46	21-Feb-2023 08:47	----	----
Compound	CAS Number	LOR	Unit		ES2305982-007	ES2305982-008	ES2305982-009	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	----	----
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	----	----
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	----	----	----
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	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC300 _230221	1302_QC400 _230221	1302_QC500 _230221	----	----
				Sampling date / time	21-Feb-2023 08:45	21-Feb-2023 08:46	21-Feb-2023 08:47	----	----
Compound	CAS Number	LOR	Unit		ES2305982-007	ES2305982-008	ES2305982-009	--------	--------
					Result	Result	Result	----	----
EP231P: PFAS Sums - Continued									
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	----	----
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	%		**99.2**	**96.7**	----	----	----
13C4-PFOS	----	0.02	%		----	----	**107**	----	----
13C8-PFOA	----	0.02	%		**98.7**	**102**	----	----	----
13C8-PFOA	----	0.02	%		----	----	**106**	----	----

Surrogate Control Limits

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

ALS Environmental

QUALITY CONTROL REPORT

Work Order	[redacted]	Page	: 1 of 7
Client		Laboratory	: E[redacted]
Contact		Contact	[redacted]
Address		Address	[redacted]
Telephone		Telephone	: +[redacted]
Project		Date Samples Received	: 24-Feb-2023
Order number		Date Analysis Commenced	: 24-Feb-2023
C-O-C number		Issue Date	: 03-Mar-2023
Sampler			
Site			
Quote number			
No. of samples received	: 8		
No. of samples analysed	: 8		

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*
[redacted]		

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 (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4901201)									
ES2305982-009	1302_QC500 _230221	EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: 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: 4901201)									
ES2305982-009	1302_QC500 _230221	EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	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 (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4901201) - continued									
ES2305982-009	1302_QC500 _230221	EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	<0.10	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4901201)									
ES2305982-009	1302_QC500 _230221	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 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: 4901201)									
ES2305982-009	1302_QC500 _230221	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 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: 4901201)									
ES2305982-009	1302_QC500 _230221	EP231X-INJ: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X-INJ: 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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4898460)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	85.2	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	96.8	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	96.0	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	90.2	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	90.0	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4901201)								
EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.5 µg/L	102	72.0	130
EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.5 µg/L	115	71.0	127
EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.5 µg/L	106	68.0	131
EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.5 µg/L	109	69.0	134
EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.5 µg/L	111	65.0	140
EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.5 µg/L	127	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4898460)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	92.5	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	99.8	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	99.8	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	102	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	101	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	110	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	93.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	103	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	99.0	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	109	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4901201)								
EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	2.5 µg/L	116	73.0	129
EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	122	72.0	129
EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	124	72.0	129
EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	127	72.0	130
EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	122	71.0	133
EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	124	69.0	130
EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	118	71.0	129
EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	120	69.0	133

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: 4901201) - continued								
EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	121	72.0	134
EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	120	65.0	144
EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	126	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4898460)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	98.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	108	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	94.1	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	99.2	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	94.4	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4901201)								
EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	131	67.0	137
EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	124	68.0	141
EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	104	68.4	127
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	1.25 µg/L	124	64.4	132
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	118	60.2	125
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	109	65.0	136
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	118	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4898460)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	101	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	100	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	108	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	101	71.4	144
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4901201)								
EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.5 µg/L	138	63.0	143
EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.5 µg/L	104	64.0	140
EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.5 µg/L	133	67.0	138
EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.5 µg/L	125	62.7	135
EP231P: PFAS Sums (QCLot: 4901201)								

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: 4901201) - continued								
EP231X-INJ: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: 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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4901201)							
ES2305982-009	1302_QC500 _230221	EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.5 µg/L	117	72.0	130
		EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.5 µg/L	115	71.0	127
		EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.5 µg/L	122	68.0	131
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.5 µg/L	124	69.0	134
		EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.5 µg/L	125	65.0	140
		EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.5 µg/L	139	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4901201)							
ES2305982-009	1302_QC500 _230221	EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	119	73.0	129
		EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	125	72.0	129
		EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	128	72.0	129
		EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	130	72.0	130
		EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	133	71.0	133
		EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	123	69.0	130
		EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	126	71.0	129
		EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	122	69.0	133
		EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	130	72.0	134
		EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.5 µg/L	129	65.0	144
		EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	128	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4901201)							
ES2305982-009	1302_QC500 _230221	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	136	67.0	137
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	110	68.0	141
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	126	68.5	127
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	1.25 µg/L	124	64.4	132

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: 4901201) - continued							
ES2305982-009	1302_QC500 _230221	EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	124	60.2	125
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	125	65.0	136
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	130	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4901201)							
ES2305982-009	1302_QC500 _230221	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.5 µg/L	142	63.0	143
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.5 µg/L	137	64.0	140
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.5 µg/L	109	67.0	138
		EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.5 µg/L	106	62.7	135

[redacted]PT NOTIFICA

Work Order

Client	[redacted]	Laboratory	[redacted]
Contact		Contact	
Address		Address	
E-mail		E-mail	
Telephone		Telephone	
Facsimile		Facsimile	
Project		Page	
Order number		Quote number	
C-O-C number		QC Level	
Site			
Sampler			

Dates

Date Samples Received	: 04-Apr-2023 09:30	Issue Date	: 05-Apr-2023
Client Requested Due Date	: 12-Apr-2023	Scheduled Reporting Date	: **12-Apr-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 18.4'C - Ice Bricks present
Receipt Detail	:	No. of samples received / analysed	: 32 / 32

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
- This is an updated SRN to correct the project ID.
- **Sample ID QC200, QC201 & QC202 will be forwarded to NMI as per COC.**
- **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 direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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)
ES2311000-001	27-Mar-2023 00:00	1302_SW132_230327	✓
ES2311000-002	27-Mar-2023 00:00	1302_QC100_230327	✓
ES2311000-003	27-Mar-2023 00:00	1302_SW133_230327	✓
ES2311000-004	27-Mar-2023 00:00	1302_SW114_230327	✓
ES2311000-005	27-Mar-2023 00:00	1302_SW104_230327	✓
ES2311000-006	27-Mar-2023 00:00	1302_SW115_230327	✓
ES2311000-007	27-Mar-2023 00:00	1302_SW106_230327	✓
ES2311000-008	27-Mar-2023 00:00	1302_SW108_230327	✓
ES2311000-009	27-Mar-2023 00:00	1302_SW168_230327	✓
ES2311000-010	27-Mar-2023 00:00	1302_SW109_230327	✓
ES2311000-011	27-Mar-2023 00:00	1302_SW300_230327	✓
ES2311000-012	28-Mar-2023 00:00	1302_SW152_230328	✓
ES2311000-013	28-Mar-2023 00:00	1302_SW170_230328	✓
ES2311000-014	28-Mar-2023 00:00	1302_SW312_230328	✓
ES2311000-015	28-Mar-2023 00:00	1302_SW178_230328	✓
ES2311000-016	28-Mar-2023 00:00	1302_QC101_230328	✓
ES2311000-017	28-Mar-2023 00:00	1302_SW181_230328	✓
ES2311000-018	28-Mar-2023 00:00	1302_SW162_230328	✓
ES2311000-019	28-Mar-2023 00:00	1302_SW160_230328	✓
ES2311000-020	28-Mar-2023 00:00	1302_SW156_230328	✓
ES2311000-021	28-Mar-2023 00:00	1302_SW113_230328	✓
ES2311000-022	28-Mar-2023 00:00	1302_SW112_230328	✓
ES2311000-023	28-Mar-2023 00:00	1302_QC102_230328	✓
ES2311000-024	28-Mar-2023 00:00	1302_SW120_230328	✓
ES2311000-025	28-Mar-2023 00:00	1302_SW125_230328	✓
ES2311000-026	28-Mar-2023 00:00	1302_SW143_230328	✓
ES2311000-027	28-Mar-2023 00:00	1302_SW124_230328	✓
ES2311000-028	27-Mar-2023 00:00	1302_QC300_230328	✓
ES2311000-029	27-Mar-2023 00:00	1302_QC400_230328	✓
ES2311000-030	28-Mar-2023 00:00	1302_QC301_230328	✓
ES2311000-031	28-Mar-2023 00:00	1302_QC401_230328	✓
ES2311000-032	28-Mar-2023 00:00	1302_QC500_230328	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)

Email [redacted]

[redacted]

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order : [redacted]

[redacted]

No. of samples analysed : 8

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

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

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	0	11	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	11	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: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-INJ)							
1302_QC500 _230221	**21-Feb-2023**	**01-Mar-2023**	20-Aug-2023	✓	**03-Mar-2023**	20-Aug-2023	✓
HDPE (no PTFE) (EP231X)							
1302_SW170 _230221, 1302_SW312 _230221, 1302_SW300 _230221, 1302_QC100_230221, 1302_QC300 _230221, 1302_QC400 _230221	**21-Feb-2023**	**28-Feb-2023**	20-Aug-2023	✓	**01-Mar-2023**	20-Aug-2023	✓
HDPE (no PTFE) (EP231X)							
1302_SW109 _230221	**23-Feb-2023**	**28-Feb-2023**	22-Aug-2023	✓	**01-Mar-2023**	22-Aug-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-INJ)							
1302_QC500 _230221	**21-Feb-2023**	**01-Mar-2023**	20-Aug-2023	✓	**03-Mar-2023**	20-Aug-2023	✓
HDPE (no PTFE) (EP231X)							
1302_SW170 _230221, 1302_SW312 _230221, 1302_SW300 _230221, 1302_QC100_230221, 1302_QC300 _230221, 1302_QC400 _230221	**21-Feb-2023**	**28-Feb-2023**	20-Aug-2023	✓	**01-Mar-2023**	20-Aug-2023	✓
HDPE (no PTFE) (EP231X)							
1302_SW109 _230221	**23-Feb-2023**	**28-Feb-2023**	22-Aug-2023	✓	**01-Mar-2023**	22-Aug-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-INJ)								
1302_QC500 _230221		**21-Feb-2023**	**01-Mar-2023**	20-Aug-2023	✓	**03-Mar-2023**	20-Aug-2023	✓
HDPE (no PTFE) (EP231X)								
1302_SW170 _230221,	1302_SW312 _230221,	**21-Feb-2023**	**28-Feb-2023**	20-Aug-2023	✓	**01-Mar-2023**	20-Aug-2023	✓
1302_SW300 _230221,	1302_QC100_230221,							
1302_QC300 _230221,	1302_QC400 _230221							
HDPE (no PTFE) (EP231X)								
1302_SW109 _230221		**23-Feb-2023**	**28-Feb-2023**	22-Aug-2023	✓	**01-Mar-2023**	22-Aug-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X-INJ)								
1302_QC500 _230221		**21-Feb-2023**	**01-Mar-2023**	20-Aug-2023	✓	**03-Mar-2023**	20-Aug-2023	✓
HDPE (no PTFE) (EP231X)								
1302_SW170 _230221,	1302_SW312 _230221,	**21-Feb-2023**	**28-Feb-2023**	20-Aug-2023	✓	**01-Mar-2023**	20-Aug-2023	✓
1302_SW300 _230221,	1302_QC100_230221,							
1302_QC300 _230221,	1302_QC400 _230221							
HDPE (no PTFE) (EP231X)								
1302_SW109 _230221		**23-Feb-2023**	**28-Feb-2023**	22-Aug-2023	✓	**01-Mar-2023**	22-Aug-2023	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X-INJ)								
1302_QC500 _230221		**21-Feb-2023**	**01-Mar-2023**	20-Aug-2023	✓	**03-Mar-2023**	20-Aug-2023	✓
HDPE (no PTFE) (EP231X)								
1302_SW170 _230221,	1302_SW312 _230221,	**21-Feb-2023**	**28-Feb-2023**	20-Aug-2023	✓	**01-Mar-2023**	20-Aug-2023	✓
1302_SW300 _230221,	1302_QC100_230221,							
1302_QC300 _230221,	1302_QC400 _230221							
HDPE (no PTFE) (EP231X)								
1302_SW109 _230221		**23-Feb-2023**	**28-Feb-2023**	22-Aug-2023	✓	**01-Mar-2023**	22-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: **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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	11	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	11	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	1	**100.00**	**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
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.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with mobile phase solvent. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. 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.

Preparation Methods	Method	Matrix	Method Descriptions
Preparation for PFAS in water.	EP231-PR	WATER	Method presumes direct injection without workup. Preparation includes addition of internal standard and surrogate, and filtration prior to analysis.
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.

QUALITY CONTROL REPORT

Work Order : [redacted]

[redacted]

No. of samples received : 32
No. of samples analysed : 32

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*
[redacted]		

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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4973618)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	109	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	92.5	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	120	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	99.8	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: 4973619)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	91.6	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	99.4	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	109	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	103	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	88.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4973618)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	109	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	112	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	118	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	108	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	111	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	121	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	128	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	100	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	120	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4973619)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	103	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	107	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	108	72.0	130

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: 4973619) - continued								
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	107	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	101	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	109	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.4	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	107	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	106	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	115	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4973618)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	99.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	119	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	117	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	118	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	114	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	91.7	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4973619)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	99.4	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	118	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	109	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	123	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	103	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	97.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4973618)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	113	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	114	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	108	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	94.2	71.4	144

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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4973619)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	105	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	124	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	106	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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

CERTIFICATE OF ANALYSIS

[redacted]

Sampler
Site
Quote number
No. of samples received
No. of samples analysed : 32

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*
[redacted]		

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.
- 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: WATER (Matrix: WATER)				Sample ID	1302_SW132_230327	1302_QC100_230327	1302_SW133_230327	1302_SW114_230327	1302_SW104_230327
				Sampling date / time	27-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2311000-001	ES2311000-002	ES2311000-003	ES2311000-004	ES2311000-005
					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	**0.16**	**0.12**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	**0.21**	**0.15**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.10**	**0.09**	**0.06**	**1.58**	**1.24**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	**0.13**	**0.08**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.20**	**0.23**	**0.08**	**3.79**	**2.46**
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	**0.05**	**0.09**	**0.06**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	**0.03**	**0.41**	**0.29**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	**0.02**	**0.05**	**0.03**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	**0.01**	**0.09**	**0.05**
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: WATER (Matrix: WATER)				Sample ID	1302_SW132_230327	1302_QC100_230327	1302_SW133_230327	1302_SW114_230327	1302_SW104_230327
				Sampling date / time	27-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2311000-001	ES2311000-002	ES2311000-003	ES2311000-004	ES2311000-005
					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		**0.30**	**0.32**	**0.25**	**6.51**	**4.48**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.30**	**0.32**	**0.14**	**5.37**	**3.70**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.30**	**0.32**	**0.25**	**6.17**	**4.25**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.5**	**106**	**96.0**	**102**	**94.2**
13C8-PFOA	----	0.02	%		**94.2**	**100**	**97.2**	**95.6**	**98.2**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW115_230327	1302_SW106_230327	1302_SW108_230327	1302_SW168_230327	1302_SW109_230327
				Sampling date / time	27-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2311000-006	ES2311000-007	ES2311000-008	ES2311000-009	ES2311000-010
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.03**	**0.03**	**0.05**	**0.03**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.03**	**0.03**	**0.06**	**0.03**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.27**	**0.26**	**0.36**	**0.26**
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	**0.59**	**0.57**	**0.67**	**0.58**
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	**0.03**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.07**	**0.06**	**0.10**	**0.06**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	**0.03**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.02**	**0.02**	**0.04**	**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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW115_230327	1302_SW106_230327	1302_SW108_230327	1302_SW168_230327	1302_SW109_230327
				Sampling date / time	27-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2311000-006	ES2311000-007	ES2311000-008	ES2311000-009	ES2311000-010
					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	**1.01**	**0.97**	**1.36**	**0.98**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.86**	**0.83**	**1.03**	**0.84**
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.98**	**0.94**	**1.28**	**0.95**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	**93.3**	**100**	**97.9**	**95.8**
13C8-PFOA	----	0.02	%		**102**	**96.3**	**95.7**	**98.8**	**96.3**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW300_230327	1302_SW152_230328	1302_SW170_230328	1302_SW312_230328	1302_SW178_230328
				Sampling date / time	27-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2311000-011	ES2311000-012	ES2311000-013	ES2311000-014	ES2311000-015
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**0.23**	<0.02	<0.02	**0.19**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**0.22**	<0.02	<0.02	**0.17**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**1.03**	**0.06**	**0.06**	**0.89**	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**0.05**	<0.02	<0.02	**0.09**	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**1.11**	**0.23**	**0.29**	**1.63**	**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		**0.2**	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**0.34**	<0.02	<0.02	**0.11**	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.66**	<0.02	<0.02	**0.46**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**0.35**	<0.02	<0.02	**0.03**	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**0.35**	<0.01	<0.01	**0.06**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		**0.03**	<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: WATER (Matrix: WATER)				Sample ID	1302_SW300_230327	1302_SW152_230328	1302_SW170_230328	1302_SW312_230328	1302_SW178_230328
				Sampling date / time	27-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2311000-011	ES2311000-012	ES2311000-013	ES2311000-014	ES2311000-015
					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		**4.57**	**0.29**	**0.35**	**3.63**	**0.04**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**2.14**	**0.29**	**0.35**	**2.52**	**0.04**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**4.27**	**0.29**	**0.35**	**3.37**	**0.04**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**102**	**97.8**	**90.4**	**94.4**	**102**
13C8-PFOA	----	0.02	%		**92.8**	**98.5**	**97.1**	**97.1**	**101**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC101_230328	1302_SW181_230328	1302_SW162_230328	1302_SW160_230328	1302_SW156_230328
				Sampling date / time	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2311000-016	ES2311000-017	ES2311000-018	ES2311000-019	ES2311000-020
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.03**	<0.02	<0.02	**0.21**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.05**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	**0.08**	<0.01	**0.01**	**0.10**
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		**0.04**	**0.96**	**0.01**	**0.09**	**0.56**
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	**0.03**	<0.02	<0.02	**0.24**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.06**	<0.02	<0.02	**0.44**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.04**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	**0.04**
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	**0.03**
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: WATER (Matrix: WATER)				Sample ID	1302_QC101_230328	1302_SW181_230328	1302_SW162_230328	1302_SW160_230328	1302_SW156_230328
				Sampling date / time	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2311000-016	ES2311000-017	ES2311000-018	ES2311000-019	ES2311000-020
					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	**0.08**
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		**0.04**	**1.16**	**0.01**	**0.10**	**1.91**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.04**	**1.04**	**0.01**	**0.10**	**0.66**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.04**	**1.16**	**0.01**	**0.10**	**1.81**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**90.6**	**105**	**108**	**109**	**111**
13C8-PFOA	----	0.02	%		**97.5**	**96.5**	**95.6**	**97.6**	**106**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW113_230328	1302_SW112_230328	1302_QC102_230328	1302_SW120_230328	1302_SW125_230328
				Sampling date / time	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2311000-021	ES2311000-022	ES2311000-023	ES2311000-024	ES2311000-025
					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	**0.13**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.02**	**0.02**	<0.02	**0.18**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.08**	**0.16**	**0.17**	**0.14**	**1.62**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.10**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.19**	**0.36**	**0.38**	**0.39**	**2.98**
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**	**0.30**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.04**	**0.04**	**0.04**	**0.47**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	**0.09**
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.01**	**0.01**	**0.01**	**0.12**
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: WATER (Matrix: WATER)				Sample ID	1302_SW113_230328	1302_SW112_230328	1302_QC102_230328	1302_SW120_230328	1302_SW125_230328
				Sampling date / time	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00	28-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2311000-021	ES2311000-022	ES2311000-023	ES2311000-024	ES2311000-025
					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**	**1.04**
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		**0.27**	**0.59**	**0.62**	**0.65**	**7.03**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.27**	**0.52**	**0.55**	**0.53**	**4.60**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.27**	**0.57**	**0.60**	**0.65**	**6.75**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**106**	**113**	**114**	**109**	**112**
13C8-PFOA	----	0.02	%		**105**	**106**	**106**	**106**	**105**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_SW143_230328	1302_SW124_230328	1302_QC300_230328	1302_QC400_230328	1302_QC301_230328
				Sampling date / time	28-Mar-2023 00:00	28-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00	28-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2311000-026	ES2311000-027	ES2311000-028	ES2311000-029	ES2311000-030
					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		**0.06**	**0.02**	<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		**0.14**	**0.08**	<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		**0.03**	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**0.03**	<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		**0.02**	<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: WATER (Matrix: WATER)				Sample ID	1302_SW143_230328	1302_SW124_230328	1302_QC300_230328	1302_QC400_230328	1302_QC301_230328
				Sampling date / time	28-Mar-2023 00:00	28-Mar-2023 00:00	27-Mar-2023 00:00	27-Mar-2023 00:00	28-Mar-2023 00:00
Compound	CAS Number	LOR	Unit		ES2311000-026	ES2311000-027	ES2311000-028	ES2311000-029	ES2311000-030
					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		**0.33**	**0.10**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.20**	**0.10**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.33**	**0.10**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**110**	**105**	**112**	**111**	**106**
13C8-PFOA	----	0.02	%		**103**	**106**	**105**	**107**	**107**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC401_230328	1302_QC500_230328	----	----	----
				Sampling date / time	28-Mar-2023 00:00	28-Mar-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2311000-031	ES2311000-032	--------	--------	--------
					Result	Result	----	----	----
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	----	----	----
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	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC401_230328	1302_QC500_230328	----	----	----
				Sampling date / time	28-Mar-2023 00:00	28-Mar-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2311000-031	ES2311000-032	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
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	----	----	----
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	%		**110**	**105**	----	----	----
13C8-PFOA	----	0.02	%		**107**	**104**	----	----	----

Surrogate Control Limits

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

QA/QC Compliance Assessment to assist with [redacted]

Project	[redacted]	Date Samples Received	: 04-Apr-2023
Site		Issue Date	: 11-Apr-2023
Sampler		No. of samples received	: 32
Order number		No. of samples analysed	: 32

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

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

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type / Method	Count QC	Count Regular	Rate (%) Actual	Rate (%) Expected	Quality Control Specification
	0				
Laboratory Duplicates (DUP)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	32	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	32	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*
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 1302_SW132_230327, 1302_QC100_230327, 1302_SW133_230327, 1302_SW114_230327, 1302_SW104_230327, 1302_SW115_230327, 1302_SW106_230327, 1302_SW108_230327, 1302_SW168_230327, 1302_SW109_230327, 1302_SW300_230327, 1302_QC300_230328, 1302_QC400_230328	**27-Mar-2023**	**05-Apr-2023**	23-Sep-2023	✓	**11-Apr-2023**	23-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_SW152_230328, 1302_SW170_230328, 1302_SW312_230328, 1302_SW178_230328, 1302_QC101_230328, 1302_SW181_230328, 1302_SW162_230328, 1302_SW160_230328, 1302_SW156_230328, 1302_SW113_230328, 1302_SW112_230328, 1302_QC102_230328, 1302_SW120_230328, 1302_SW125_230328, 1302_SW143_230328, 1302_SW124_230328, 1302_QC301_230328, 1302_QC401_230328, 1302_QC500_230328	**28-Mar-2023**	**05-Apr-2023**	24-Sep-2023	✓	**11-Apr-2023**	24-Sep-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)							
1302_SW132_230327, 1302_QC100_230327, 1302_SW133_230327, 1302_SW114_230327, 1302_SW104_230327, 1302_SW115_230327, 1302_SW106_230327, 1302_SW108_230327, 1302_SW168_230327, 1302_SW109_230327, 1302_SW300_230327, 1302_QC300_230328, 1302_QC400_230328	**27-Mar-2023**	**05-Apr-2023**	23-Sep-2023	✓	**11-Apr-2023**	23-Sep-2023	✓
HDPE (no PTFE) (EP231X)							
1302_SW152_230328, 1302_SW170_230328, 1302_SW312_230328, 1302_SW178_230328, 1302_QC101_230328, 1302_SW181_230328, 1302_SW162_230328, 1302_SW160_230328, 1302_SW156_230328, 1302_SW113_230328, 1302_SW112_230328, 1302_QC102_230328, 1302_SW120_230328, 1302_SW125_230328, 1302_SW143_230328, 1302_SW124_230328, 1302_QC301_230328, 1302_QC401_230328, 1302_QC500_230328	**28-Mar-2023**	**05-Apr-2023**	24-Sep-2023	✓	**11-Apr-2023**	24-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
1302_SW132_230327, 1302_QC100_230327, 1302_SW133_230327, 1302_SW114_230327, 1302_SW104_230327, 1302_SW115_230327, 1302_SW106_230327, 1302_SW108_230327, 1302_SW168_230327, 1302_SW109_230327, 1302_SW300_230327, 1302_QC300_230328, 1302_QC400_230328	**27-Mar-2023**	**05-Apr-2023**	23-Sep-2023	✓	**11-Apr-2023**	23-Sep-2023	✓
HDPE (no PTFE) (EP231X)							
1302_SW152_230328, 1302_SW170_230328, 1302_SW312_230328, 1302_SW178_230328, 1302_QC101_230328, 1302_SW181_230328, 1302_SW162_230328, 1302_SW160_230328, 1302_SW156_230328, 1302_SW113_230328, 1302_SW112_230328, 1302_QC102_230328, 1302_SW120_230328, 1302_SW125_230328, 1302_SW143_230328, 1302_SW124_230328, 1302_QC301_230328, 1302_QC401_230328, 1302_QC500_230328	**28-Mar-2023**	**05-Apr-2023**	24-Sep-2023	✓	**11-Apr-2023**	24-Sep-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) 1302_SW132_230327, 1302_QC100_230327, 1302_SW133_230327, 1302_SW114_230327, 1302_SW104_230327, 1302_SW115_230327, 1302_SW106_230327, 1302_SW108_230327, 1302_SW168_230327, 1302_SW109_230327, 1302_SW300_230327, 1302_QC300_230328, 1302_QC400_230328	**27-Mar-2023**	**05-Apr-2023**	23-Sep-2023	✓	**11-Apr-2023**	23-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_SW152_230328, 1302_SW170_230328, 1302_SW312_230328, 1302_SW178_230328, 1302_QC101_230328, 1302_SW181_230328, 1302_SW162_230328, 1302_SW160_230328, 1302_SW156_230328, 1302_SW113_230328, 1302_SW112_230328, 1302_QC102_230328, 1302_SW120_230328, 1302_SW125_230328, 1302_SW143_230328, 1302_SW124_230328, 1302_QC301_230328, 1302_QC401_230328, 1302_QC500_230328	**28-Mar-2023**	**05-Apr-2023**	24-Sep-2023	✓	**11-Apr-2023**	24-Sep-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 1302_SW132_230327, 1302_QC100_230327, 1302_SW133_230327, 1302_SW114_230327, 1302_SW104_230327, 1302_SW115_230327, 1302_SW106_230327, 1302_SW108_230327, 1302_SW168_230327, 1302_SW109_230327, 1302_SW300_230327, 1302_QC300_230328, 1302_QC400_230328	**27-Mar-2023**	**05-Apr-2023**	23-Sep-2023	✓	**11-Apr-2023**	23-Sep-2023	✓
HDPE (no PTFE) (EP231X) 1302_SW152_230328, 1302_SW170_230328, 1302_SW312_230328, 1302_SW178_230328, 1302_QC101_230328, 1302_SW181_230328, 1302_SW162_230328, 1302_SW160_230328, 1302_SW156_230328, 1302_SW113_230328, 1302_SW112_230328, 1302_QC102_230328, 1302_SW120_230328, 1302_SW125_230328, 1302_SW143_230328, 1302_SW124_230328, 1302_QC301_230328, 1302_QC401_230328, 1302_QC500_230328	**28-Mar-2023**	**05-Apr-2023**	24-Sep-2023	✓	**11-Apr-2023**	24-Sep-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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	32	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	32	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	32	**0.00**	**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
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	[redacted]		
Client	[redacted]	Laboratory	[redacted]
Project	[redacted]	Page	: 1 of 3
Order number		Quote number	: ES2019AECOMAU0030 (SY/139/19 V3)
C-O-C number		QC Level	: NEPM 2013 B3 & ALS QC Standard
Site			
Sampler			

Dates

Date Samples Received	: 18-Apr-2023 08:30	Issue Date	: 18-Apr-2023
Client Requested Due Date	: 24-Apr-2023	Scheduled Reporting Date	: **24-Apr-2023**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: ----	Temperature	: 25.8'C
Receipt Detail	:	No. of samples received / analysed	: 8 / 8

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 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.**
- **QC Forward analysis will be conducted by NMI.**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- 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)
ES2312445-001	14-Apr-2023 00:00	1302_SW170_230414	✓
ES2312445-002	14-Apr-2023 00:00	1302_SW300_230414	✓
ES2312445-003	14-Apr-2023 00:00	1302_SW312_230414	✓
ES2312445-004	14-Apr-2023 00:00	1302_SW109_230414	✓
ES2312445-005	14-Apr-2023 00:00	1302_QC100_230414	✓
ES2312445-007	14-Apr-2023 00:00	1302_QC300_230414	✓
ES2312445-008	14-Apr-2023 00:00	1302_QC400_230414	✓
ES2312445-009	14-Apr-2023 00:00	1302_QC500_230414	✓

Proactive Holding Time Report

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

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV) — Email

[redacted] — Email

[redacted] — Email

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CERTIFICATE OF ANALYSIS

Work Order	[redacted]	Page	: 1 of 7
Client		Laboratory	: [redacted]
Contact		Contact	: [redacted]
Address		Address	: 2[redacted]
Telephone		Telephone	: [redacted]
Project		Date Samples Received	: 18-Apr-2023 08:30
Order number		Date Analysis Commenced	: 18-Apr-2023
C-O-C number		Issue Date	: 21-Apr-2023 13:07
Sampler			
Site			
Quote number			
No. of samples received			
No. of samples analysed			

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*
[redacted]		

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.
- 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: WATER (Matrix: WATER)				Sample ID	1302_SW170_230414	1302_SW300_230414	1302_SW312_230414	1302_SW109_230414	1302_QC100_230414
				Sampling date / time	14-Apr-2023 00:00	14-Apr-2023 00:00	14-Apr-2023 00:00	14-Apr-2023 00:00	14-Apr-2023 00:00
Compound	CAS Number	LOR	Unit		ES2312445-001	ES2312445-002	ES2312445-003	ES2312445-004	ES2312445-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	**0.18**	**0.06**	**0.03**	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	**0.17**	**0.06**	**0.03**	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**0.03**	**0.96**	**0.51**	**0.26**	**0.03**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	**0.05**	**0.03**	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**0.16**	**1.24**	**1.63**	**0.52**	**0.17**
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**	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	**0.35**	**0.02**	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	**0.62**	**0.13**	**0.07**	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	**0.36**	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	**0.36**	**0.04**	**0.02**	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	**0.04**	<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: WATER (Matrix: WATER)				Sample ID	1302_SW170_230414	1302_SW300_230414	1302_SW312_230414	1302_SW109_230414	1302_QC100_230414
				Sampling date / time	14-Apr-2023 00:00	14-Apr-2023 00:00	14-Apr-2023 00:00	14-Apr-2023 00:00	14-Apr-2023 00:00
Compound	CAS Number	LOR	Unit		ES2312445-001	ES2312445-002	ES2312445-003	ES2312445-004	ES2312445-005
					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		**0.19**	**4.53**	**2.48**	**0.93**	**0.20**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.19**	**2.20**	**2.14**	**0.78**	**0.20**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.19**	**4.27**	**2.39**	**0.90**	**0.20**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**105**	**102**	**103**	**96.5**
13C8-PFOA	----	0.02	%		**105**	**99.3**	**104**	**98.4**	**103**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC300_230414	1302_QC400_230414	1302_QC500_230414	----	----
				Sampling date / time	14-Apr-2023 00:00	14-Apr-2023 00:00	14-Apr-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2312445-007	ES2312445-008	ES2312445-009	--------	--------
					Result	Result	Result	----	----
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	----	----
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	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	1302_QC300_230414	1302_QC400_230414	1302_QC500_230414	----	----
				Sampling date / time	14-Apr-2023 00:00	14-Apr-2023 00:00	14-Apr-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		ES2312445-007	ES2312445-008	ES2312445-009	--------	--------
					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	----	----
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	----	----
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	%		**106**	**98.8**	**102**	----	----
13C8-PFOA	----	0.02	%		**103**	**99.1**	**102**	----	----

Surrogate Control Limits

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

QUALITY CONTROL REPORT

Work Order	[redacted]	Page	: 1 of 4
Client		Laboratory	: [redacted]
Contact		Contact	: [redacted]
Address		Address	: [redacted]
Telephone		Telephone	: +[redacted]
Project		Date Samples Received	: 18-Apr-2023
Order number		Date Analysis Commenced	: 18-Apr-2023
C-O-C number		Issue Date	: 21-Apr-2023
Sampler			
Site			
Quote number			
No. of samples received			
No. of samples analysed	: 8		

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*
[redacted]		

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%.

- **No Laboratory Duplicate (DUP) Results are required to be reported.**

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
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4997764)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.25 µg/L	80.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.25 µg/L	99.8	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.25 µg/L	90.8	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.25 µg/L	93.6	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	86.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.25 µg/L	86.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4997764)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	87.6	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	95.4	72.0	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.25 µg/L	91.6	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	94.0	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	93.0	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	91.6	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	86.8	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	91.0	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	97.2	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	92.9	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4997764)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	88.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	87.1	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	89.7	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	99.7	66.0	145
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	92.7	57.6	145
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	94.2	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	89.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4997764)								

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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4997764) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	96.0	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	91.2	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	92.6	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	78.8	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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order [redacted]

[redacted]

No. of samples analysed : 8

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

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

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	0	17	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	17	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: Date extracted	Extraction / Preparation: Due for extraction	Extraction / Preparation: Evaluation	Analysis: Date analysed	Analysis: Due for analysis	Analysis: Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW170_230414, 1302_SW300_230414, 1302_SW312_230414, 1302_SW109_230414, 1302_QC100_230414, 1302_QC300_230414, 1302_QC400_230414, 1302_QC500_230414	**14-Apr-2023**	**18-Apr-2023**	11-Oct-2023	✓	**20-Apr-2023**	11-Oct-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
1302_SW170_230414, 1302_SW300_230414, 1302_SW312_230414, 1302_SW109_230414, 1302_QC100_230414, 1302_QC300_230414, 1302_QC400_230414, 1302_QC500_230414	**14-Apr-2023**	**18-Apr-2023**	11-Oct-2023	✓	**20-Apr-2023**	11-Oct-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X)							
1302_SW170_230414, 1302_SW300_230414, 1302_SW312_230414, 1302_SW109_230414, 1302_QC100_230414, 1302_QC300_230414, 1302_QC400_230414, 1302_QC500_230414	**14-Apr-2023**	**18-Apr-2023**	11-Oct-2023	✓	**20-Apr-2023**	11-Oct-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)								
1302_SW170_230414,	1302_SW300_230414,	**14-Apr-2023**	**18-Apr-2023**	11-Oct-2023	✓	**20-Apr-2023**	11-Oct-2023	✓
1302_SW312_230414,	1302_SW109_230414,							
1302_QC100_230414,	1302_QC300_230414,							
1302_QC400_230414,	1302_QC500_230414							
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
1302_SW170_230414,	1302_SW300_230414,	**14-Apr-2023**	**18-Apr-2023**	11-Oct-2023	✓	**20-Apr-2023**	11-Oct-2023	✓
1302_SW312_230414,	1302_SW109_230414,							
1302_QC100_230414,	1302_QC300_230414,							
1302_QC400_230414,	1302_QC500_230414							

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)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	17	**0.00**	**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	0	17	**0.00**	**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
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.

Appendix G

Calibration Certificates

D R A F T

Appendix G Calibration Certificates

AECOM

1302 - RAAF Base Darwin

Level 3, 9 Cavenagh Street
Darwin, Nt 0800

Water Quality Probe Calibration Sheet

Date	YSI #	Temp (°C)	pH 4		pH 7		DO (100%)		Electrical conductivity 1413 (µS/cm)		ORP		Initials
			Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	
21/11	A	23.7	4.23	4.02	7.10	7.00	100%	-	1430	1414	211	229	[redacted]
22/11	A	24.1	4.03	4.02	7.01	7.01	100%	-	1414	1413	229	229	

AECOM

1302 - RAAF BASE DARWIN - Mass Flux

Level 3, 9 Cavenagh Street
Darwin, Nt 0800

Water Quality Probe Calibration Sheet

Date	YSI #	Temp (°C)	pH 4		pH 7		DO (100%)		Electrical conductivity 1413 (µS/cm)		ORP		Initials
			Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	
22/12	A	23.7	4.17	4.02	7.02	7.00	100%	-	1473	1413	241	231	[redacted]

AECOM

1302 - RAAF Base Darwin - WQMP & PFASOMP

Level 3, 9 Cavenagh Street
Darwin, Nt 0800

Water Quality Probe Calibration Sheet

Date	YSI #	Temp (°C)	pH 4		pH 10		DO (100%)		Electrical conductivity 1413 (µS/cm)		ORP		Initials
			Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	Pre-cal	Post-cal	
13/3	A	30.0	5.57	4.02	9.89	10.06	100%	-	1406	1547	227	218	[redacted]
14/3	A	30.5	4.05	4.01	10.06	10.06	100%	-	1557	1548	217	218	
15/3	A	30.2	4.03	4.02	10.04	10.06	102%	-	1548	1548	218	218	
23/3	A	29.7	4.15	4.02	9.73	10.05	103%	-	1473	1548	251	217	
27/3	A	28.5	4.02	4.01	9.80	10.06	100%	-	1547	1548	217	218	
28/3	A	30.1	4.02	4.01	10.04	10.06	101%	-	1548	1548	218	218	

Appendix C

Tables

AECOM

Table T - 1 Historical Groundwater Quality Parameters

Client Name: Department of Defence
Project Name: PFAS OMP - RAAF Base Darwin
Project No: 60612561

Location ID	Sampled Date	Depth to Water (mbtoc)	Well Depth (mbtoc)	TOC (mAHD)	Water Elevation (mAHD)	Condition of Gatic	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Eh (mV)	Redox (corr) (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method
MW103	2/11/2020	4.189	10.473	19.55	15.361	NR	0.76	179.3	116.545	5.59	47.9	253.7	31.4	Medium	Light Brown	No Odour	No Sheen	HydraSleeve
MW103	29/04/2021	4.201	12.62	19.55	15.349	NR	0.663	97.8	63.57	5.26	128	333.8	32.3	Turbid	NR	No Odour	NR	Hydrasleeve
MW103	11/11/2021	4.328	12.45	19.55	15.221	Good	1.14	72.3	47	5.30	133.4	339.2	31.5	Medium	Light Brown	No odour	NR	Hydrasleeve
MW103	3/03/2022	2.483	12.23	19.55	17.067	NR	1.69	96.8	62.92	4.68	113.9	319.7	32.2	Clear	Brown	No Odour	NR	Hydrasleeve
MW103	26/09/2022	3.770	12.26	19.55	15.779	Good	2.27	84.1	50.46	5.66	143.1	348.9	30	Low	Brown	No odour	No sheen	Hydrasleeve
MW103	17/03/2023	2.940	12.10	19.55	16.609	Good	1.06	86	52	4.95	75.7	281.5	30.9	Moderate	Orange	No odour	No sheen	Hydrasleeve
MW107	2/11/2020	4.189	13.399	21.94	17.751	NR	0.22	197.2	128.18	5.63	-1.5	204.3	31	Turbid	Brown	Slightly Organic	No Sheen	HydraSleeve
MW107	29/04/2021	4.201	15.36	21.94	17.739	NR	1.05	140.5	91.325	5.29	8.5	214.3	31.9	Turbid	Grey	Organic Odour	NR	Hydrasleeve
MW107	11/11/2021	3.943	15.65	21.94	17.997	Good	0.44	57.1	37	4.97	91.8	297.6	31.1	Low	Light Brown	No odour	NR	Hydrasleeve
MW107	3/03/2022	2.483	14.94	21.94	19.457	NR	2.16	107.1	69.615	5.3	137.8	343.6	30.4	Clear	Orange	Slightly Organic	NR	Hydrasleeve
MW107	26/09/2022	4.960	15.10	21.94	16.981	Good	0.65	39.9	23.94	4.84	155.2	361	29.3	Low	Grey	No odour	No sheen	Hydrasleeve
MW107	17/03/2023	2.910	14.54	21.94	19.031	Good	0.78	74	45	4.41	103.5	309.3	31.1	High	Brown	No odour	No sheen	Hydrasleeve
MW112	3/11/2020	7.054	12.343	26.97	19.916	NR	1.86	36.7	23.855	4.64	261.5	467.3	31.3	Medium	Colourless	No Odour	No Sheen	HydraSleeve
MW112	29/04/2021	5.143	14.11	26.97	21.827	NR	1.69	42.6	27.69	5.81	207.3	413.1	32.1	Turbid	Grey/Brown	No Odour	NR	Hydrasleeve
MW112	10/11/2021	7.918	14.00	26.97	19.052	Good	3.68	29.7	19	5.68	292.8	498.6	31.3	Low	Grey	No odour	NR	Hydrasleeve
MW112	7/03/2022	2.839	13.835	26.97	24.131	NR	4.65	57.9	37.635	4.46	97.7	303.5	32.2	Clear	NR	No Odour	NR	Hydrasleeve
MW112	7/10/2022	7.870	13.66	26.97	19.101	Good	2.08	40.2	24.12	4.47	131.5	337.3	32.3	Low	Grey	No odour	No sheen	Hydrasleeve
MW112	13/03/2023	2.580	13.55	26.97	24.391	Good	1.07	264	158	5.89	63.2	269	30.2	High	Brown	No odour	No sheen	Hydrasleeve
MW115	3/11/2020	8.31	13.195	32.41	24.1	NR	0.95	53.5	34.775	4.73	229.5	435.3	30.6	Low	Colourless	No Odour	No Sheen	HydraSleeve
MW115	29/04/2021	5.12	6.081	32.41	27.29	NR	3.71	45.5	29.575	7.28	164.4	370.2	31	Turbid	Brown	No Odour	NR	Hydrasleeve
MW115	10/11/2021	6.710	15.050	32.41	25.7	Good	3.84	63.1	41	8.60	294	499.8	31.3	Low	Light Brown	No odour	NR	Hydrasleeve
MW115	7/03/2022	3.318	15.7	32.41	29.092	NR	3.92	57.5	37.375	4.05	157.1	362.9	31.9	NR	Orange/Brown	Slightly Organic	NR	Hydrasleeve
MW115	27/09/2022	10.240	14.92	32.41	22.167	Good	NM	NM	NM	NM	NM	NM	NM	NR	NR	NR	NR	Hydrasleeve
MW115	13/03/2023	3.750	14.73	32.41	28.657	Good	1.96	70	42	5.67	59.8	265.6	29.3	High	Brown	No odour	No sheen	Hydrasleeve
MW128	3/11/2020	2.32	12.513	11.39	9.07	NR	1.01	66.5	43.225	3.98	267.2	473	31.5	Low	Light Brown	No Odour	No Sheen	HydraSleeve
MW128	12/12/2020	2.288	14.935	11.39	9.102	NR	1.76	66.6	43.29	4.19	103.9	309.7	43.29	NR	NR	NR	NR	Hydrasleeve
MW128	25/02/2021	1.43	14.795	11.39	9.96	NR	0.98	84.7	55.055	4.32	193.3	399.1	31.5	NR	NR	NR	NR	Hydrasleeve
MW128	6/05/2021	2.22	12.513	11.39	9.17	NR	0.83	69.6	45.24	4.67	273.4	479.2	31.7	Slightly Turbid	Light Grey/Brown	No Odour	NR	Hydrasleeve
MW128	11/11/2021	2.270	14.77	11.39	9.12	Good	1.06	47.5	31	4.22	265.5	471.3	32.2	Low	Orange / Brown	No odour	NR	Hydrasleeve
MW128	3/03/2022	1.795	14.655	11.39	9.595	NR	2.06	145.1	94.315	4.39	135.5	341.3	31.9	NR	Orange/Brown	No Odour	NR	Hydrasleeve
MW128	7/10/2022	2.130	14.62	11.39	9.264	Good	0.86	57.3	34.38	4.09	175.2	381	31.8	Low	Grey	No odour	No sheen	Hydrasleeve
MW128	17/03/2023	1.900	12.27	11.39	9.494	Good	1.09	80	48	5.29	57.4	263.2	30.4	Moderate	Orange	No odour	No sheen	Hydrasleeve
MW133	15/02/2021	4.63	15.855	30.21	25.58	NR	1.09	58.1	37.765	4.77	177.6	383.4	32.9	Clear	Clear	No Odour	No Sheen	Hydrasleeve
MW133	6/05/2021	7.03	NM	30.21	23.18	NR	1.64	64.7	42.055	5.9	92	297.8	32.7	Clear	Clear	Hydrocarbon Odour	NR	Hydrasleeve
MW133	9/06/2021	8.25	NM	30.21	21.96	NR	1.32	98.9	64.285	6.5	30.4	236.2	32.5	Clear	NR	Strong Hydrocarbon Odour	NR	Hydrasleeve
MW133	11/11/2021	11.135	14.89	30.21	19.075	Good	0.68	89.6	58	7.92	14.1	219.9	31.6	Low	Grey	HC odour	NR	Hydrasleeve
MW133	4/03/2022	4.482	14.88	30.21	25.728	NR	1.44	61.2	39.78	5.1	132.5	338.3	32.2	Clear	Orange	Hydrocarbon Odour	NR	Hydrasleeve
MW133	19/10/2022	13.151	16.70	30.90	17.751	Good	1.76	97.5	58.5	7.09	-24.5	181.3	27.1	Low	Grey	No odour	No sheen	Hydrasleeve
MW133	15/03/2023	NM	NM	30.90	NA	Good	1.92	46	27	4.80	55.1	260.9	33.7	Moderate	Grey	No odour	No sheen	Hydrasleeve
MW139	2/11/2020	6.635	13.583	28.55	21.915	NR	1.21	40.8	26.52	4.45	276.6	482.4	31.7	Medium	Grey/Brown	No Odor	No Sheen	HydraSleeve
MW139	6/05/2021	3.82	13.583	28.55	24.73	NR	1.92	46.9	30.485	5.25	280.7	486.5	31.3	Turbid	Light Grey/Brown	No Odour	NR	Hydrasleeve
MW139	10/11/2021	9.110	15.52	28.55	19.44	Good	3.75	29.9	19	3.95	294.2	500	31.2	Low	Light Brown	No odour	NR	Hydrasleeve
MW139	4/03/2022	2.227	14.44	28.55	26.323	NR	1.94	46.2	30.03	4.95	159.3	365.1	31	Clear	Dark Brown	No Odour	NR	Hydrasleeve
MW139	27/09/2022	9.990	15.42	28.55	18.558	Good	1.1	35.3	21.18	4.52	156.8	362.6	30.2	Low	Grey	No odour	No sheen	Hydrasleeve
MW139	16/03/2023	2.350	15.43	28.55	26.198	Good	0.88	544	326	5.06	39.4	245.2	30.3	High	Brown	No odour	No sheen	Hydrasleeve
MW141	2/11/2020	8.88	14.238	30.1	21.22	NR	3.62	60.3	39.195	5.26	177.8	383.6	30.4	Low	Light Grey	No Odour	No Sheen	HydraSleeve
MW141	6/05/2021	6.64	14.238	30.1	23.46	NR	0.73	64.5	41.925	5.69	236.1	441.9	30.1	Turbid	Light Grey/White	No Odour	NR	HydraSleeve
MW141	10/11/2021	11.351	15.98	30.10	18.749	Good	1.37	39.6	26	4.38	252.9	458.7	30.7	Low	Light Brown	No odour	NR	Hydrasleeve
MW141	4/03/2022	4.194	15.95	30.1	25.906	NR	1.75	58.6	38.09	4.75	152.9	358.7	31	Clear	Clear	No Odour	NR	HydraSleeve
MW141	27/09/2022	9.880	15.94	30.10	20.217	Good	NM	NM	NM	NM	NM	NM	NM	NR	NR	NR	NR	Hydrasleeve
MW141	16/03/2023	4.340	14.83	30.10	25.757	Good	2.10	57	34	4.81	62.5	268.3	31.4	High	Brown	No odour	No sheen	Hydrasleeve
MW144	3/11/2020	9.078	14.055	30.69	21.612	NR	1.5	51.4	33.41	4.46	248.2	454	31.5	Low	Light Grey	Slight Organic Odour	No Sheen	HydraSleeve
MW144	29/04/2021	8.434	15.76	30.69	22.256	NR	2.43	43.6	28.34	5.1	241.2	447	32.3	Clear	Clear	No Odour	NR	Hydrasleeve
MW144	10/11/2021	9.524	15.77	30.69	21.166	Good	2.54	57.8	38	4.51	256.5	462.3	32.5	Clear	Clear	No odour	NR	Hydrasleeve
MW144	4/03/2022	6.555	15.755	30.69	24.135	NR	4.42	42.6	27.69	4.65	148.6	354.4	31.3	Clear	Clear	No Odour	NR	Hydrasleeve
MW144	27/09/2022	9.990	15.71	30.69	20.696	Good	1.32	39.2	23.52	4.48	192.1	397.9	30.4	Low	Grey	No odour	No sheen	Hydrasleeve
MW144	20/04/2023	6.800	14.70	30.69	23.886	Good	0.15	31	18	6.86	130.6	336.4	26.5	High	Brown	No odour	No sheen	Hydrasleeve
MW148	3/11/2020	3.05	11.482	12.16	9.11	NR	1.83	79.2	51.48	4.98	148.5	354.3	31.7	Low	Clear	No Odour	No Sheen	Hydrasleeve
MW148	12/12/2020	2.938	12.9	12.16	9.222	NR	1.13	67.6	43.94	4.92	120.6	326.4	43.94	NR	NR	NR	NR	Hydrasleeve
MW148	25/02/2021	3.478	12.85	12.16	8.682	NR	NM	NM	NM	NM	NM	NM	NM	NR	NR	NR	NR	Hydrasleeve
MW148	6/05/2021	2.91	11.482	12.16	9.25	NR	0.79	92.7	60.255	5.18	108.7	314.5	33.1	Turbid	Orange	Hydrogen Sulfide Odour	NR	Hydrasleeve
MW148	7/03/2022	NM	NM	12.16	NA	NR	Not Able to Sample - Bent PVC Casing											
MW148	27/09/2022	3.390	11.44	12.16	8.766	Good	0.71	61.5	36.9	4.3	162.8	368.6	30.9	Low	Grey	No odour	No sheen	Hydrasleeve
MW148	17/03/2023	2.510	11.40	12.16	9.646	Good	0.98	102	61	5.61	93.2	299	31.2	Moderate	Brown	No odour	No sheen	Hydrasleeve
MW156	3/11/2020	3.465	11.5	23.04	19.575	NR	1.7	78.2	50.83	5.22	110.2	316	29.8	Low	White	No Odour	No Sheen	HydraSleeve
MW156	12/12/2020	3.535	12.535	23.04	19.505	NR	1.6	66.5	43.225	5.23	66.1	271.9	43.225	NR	NR	NR	NR	Hydrasleeve
MW156	25/02/2021	2.336	12.066	23.04	20.704	NR	1.44	45	29.25	4.26	189	394.8	30.4	NR	NR	NR	NR	Hydrasleeve
MW156	29/04/2021	2.502	12.6	23.04	20.538	NR	1.1	67.2	43.68	5.01	74.7	280.5	30.2	Clear	Colourless	Organic Odour	NR	Hydrasleeve
MW156	10/11/2021	4.659	12.03	23.04	18.381	Good	1.64	30.5	20	4.72	280	485.8	30.3	Medium	Light Brown	No odour	NR	Hydrasleeve
MW156	7/03/2022	1.582	11.97	23.04	21.458	NR	3.49	37.8	24.57	4.28	160.7	366.5	30.2	Clear	Orange/Brown	No Odour	NR	Hydrasleeve
MW156	27/09/2022	4.650	12.07	23.04	18.393	Good	1.35	49.9	29.94	5.13	139	344.8	30.1	Low	Grey	No odour	No sheen	Hydrasleeve
MW156	13/03/2023	1.510	11.90	23.04	21.533	Good	4.01	53	32	4.48	76.2	282	31.9	High	Brown	No odour	No sheen	Hydrasleeve
MW176	4/11/2020	3.878	9.043	18.74	14.862	NR	0.53	65.3	42.445	5.36	232.4	438.2	31.5	Turbid	Red/Brown	No Odour	No Sheen	Hydrasleeve
MW176	28/04/2021	3.774	11.69	18.74	14.966	NR	0.83	92.9	60.385	5.66	116.4	322.2	30.3	Turbid	Brown	No Odour	NR	Hydrasleeve
MW176	11/11/2021	4.152	11.68	18.74	14.588	Good	1.78	75.5	49	4.92	212	417.8	31.7	Low	Orange / Brown	No odour	NR	Hydrasleeve
MW176	2/03/2022	2.649	11.7	18.74	16.091	NR	2.6	148.8	96.72	5.8	111	316.8	30.8	Clear	Orange/Brown	No Odour	NR	Hydrasleeve
MW176	26/09/2022	5.030	11.68	18.74	13.709	Good	1.67	36.4	21.84	5.06	140.3	346.1	29.7	Low	Grey	No odour	No sheen	Hydrasleeve
MW176	16/03/2023	3.160	11.67	18.74	15.579	Good	1.56	38	23	4.70	95.4	301.2	29.9	High	Brown	No odour	No sheen	Hydrasleeve
MW180	2/11/2020	10.93	12.99	29.06	18.13	NR	5.16	76.5	49.725	4.85	240.3	446.1	33.4	Low	Grey/Brown	No Odour	No Sheen	Hydrasleeve
MW180	28/04/2021	7.097	12.99	29.06	21.963	NR	3.51	77	50.05	5.19	244	449.8	31.9	Turbid	Brown	No Odour	NR	Hydrasleeve
MW180	11/11/2021	12.544	15.00	29.06	16.516	Good	3.51	50.7	33	4.37	283	488.8	32.1	Low	Yellow / Brown	No odour	NR	Hydrasleeve
MW180	2/03/2022	3.822	15.2	29.06	25.238	NR	5.2	65.1	42.315	4.82	134.6	340.4	33.2	Clear	Light Brown	No Odour	NR	Hydrasleeve
MW180	26/09/2022	12.270	15.02	29.06	16.786	Good	1.51	63.9	38.34	4.4	166.9	372.7	31.5	Low	Red-brown	No odour	No sheen	Hydrasleeve
MW180	16/03/2023	3.850	14.82	29.06	25.206	Good	2.51	38	23	4.95	97.1	302.9	30.6	High	Brown	No odour	No sheen	Hydrasleeve
MW185	2/11/2020	2.384	10.65	5.82	3.436	NR	1.67	759	493.35	5.55	122.2	328	31.4	Turbid	Brown	No Odour	No Sheen	Hydrasleeve
MW185	28/04/2021	2.124	10.53	5.82	3.696	NR	0.71	1936	1258.4	7.77	159.3	365.1	31.3	Very Turbid	Red	No Odour	NR	Hydrasleeve
MW185	11/11/2021	2.795	10.50	5.82	3.025	Good	1.50	412.3	268	4.44	255.9	461.7	31.5	Low	Light Brown	No odour	NR	Hydrasleeve
MW185	2/03/2022	1.188	10.6	5.82	4.632	NR	1.65	582	378.3	5.06	156.6	362.4	32	Clear	Clear	No Odour	NR	Hydrasleeve
MW185	27/09/2022	3.240	10.37	5.82	2.583	Good	0.94	618	370.8	4.61	168	373.8	30.4	Low	Grey	No odour	No sheen	Hydrasleeve
MW185	17/03/2023	1.570	10.35	5.82	4.253	Good	1.83	96	57	5.67	60.7	266.5	30.6	High	Brown	No odour	No sheen	Hydrasleeve
MW190	11/11/2021	1.779	12.40	11.34	9.563	Good	1.57	58	38	4.54	254.4	460.2	33.6	Low	Light Brown	No odour	NR	Hydrasleeve
MW190	27/09/2022	1.970	12.38	11.34	9.372	Good	1.31	47.2	28.32	4.51	152.3	358.1	32.7	Low	Grey	No odour	No sheen	Hydrasleeve
MW190	17/03/2023	1.490	12.39	11.34	9.852	Good	1.52	73	44	5.04	72.6	278.4	31.7	High	Brown	No odour	No sheen	Hydrasleeve
MW191	3/11/2020	4.045	10.893	10.91	6.865	NR	2.31	62.8	40.82	5.4	190.9	396.7	31.6	Turbid	Light Brown	No Odour	No Sheen	Hydrasleeve
MW191	28/04/2021	3.29	12.73	10.91	7.62	NR	2.43	95.6	62.14	5.97	213	418.8	33	Turbid	Brown	No Odour	NR	Hydrasleeve
MW191	11/11/2021	4.029	12.72	10.91	6.881	Good	3.13	62.7	41	5.02	205.9	411.7	32.9	Low	Light Brown	No odour	NR	Hydrasleeve
MW191	7/03/2022	2.76	12.755	10.91	8.15	NR	2.25	64.6	41.99	5.08	159.1	364.9	32.5	Clear	Orange/Light Brown	No Odour	NR	Hydrasleeve
MW191	27/09/2022	5.540	12.71	10.91	5.369	Good	1.25	61.4	36.84	4.43	167.6	373.4	31.8	Low	Grey	No odour	No sheen	Hydrasleeve
MW191	17/03/2023	2.770	12.69	10.91	8.139	Good	2.07	116	70	5.38	55.1	260.9	30.7	High	Brown	No odour	No sheen	Hydrasleeve
MW193	2/11/2020	1.801	10.58	13.14	11.339	NR	2.9	90.1	58.565	5.11	152	357.8	32.4	Turbid	Brown	No Odour	No Sheen	Hydrasleeve
MW193	6/05/2021	2.67	10.58	13.14	10.47	NR	1.67	53.8	34.97	6.79	232.8	438.6	30.5	Turbid	Brown	Organic Odour	NR	Hydrasleeve
MW194	2/11/2020	2.541	11.65	18.24	15.699	NR	3.94	88.9	57.785	6.18	102.5	308.3	31.4	Low	Grey/Brown	Slight Organic Odour	No Sheen	Hydrasleeve
MW194	6/05/2021	1.74	11.65	18.24	16.5	NR	0.98	60.2	39.13	7.62	164.5	370.3	27.7	Clear	Clear	Hydrogen Sulfide Odour	NR	Hydrasleeve
MW194	11/11/2021	3.146	12.44	18.24	15.094	Good	2.00	23.6	15	4.27	258	463.8	32.6	Low	Light Brown	No odour	NR	Hydrasleeve
MW194	3/03/2022	1.319	12.44	18.24	16.921	NR	1.65	42.9	27.885	4.77	157.4	363.2	31.4	Clear	Clear	Slight Organic Odour	NR	Hydrasleeve
MW194	27/09/2022	3.970	12.42	18.24	14.268	Good	1.37	33.5	20.1	4.55	141.6	347.4	30.3	Low	Grey	No odour	No sheen	Hydrasleeve
MW194	17/03/2023	1.370	12.40	18.24	16.868	Good	0.81	92	55	5.61	37.8	243.6	30.4	Moderate	Orange	No odour	No sheen	Hydrasleeve
MW195	2/11/2020	2.009	10.679	16.74	14.731	NR	2.17	80.7	52.455	4.81	198.5	404.3	31.8	Medium	Yellow/Brown	No Odour	No Sheen	Hydrasleeve
MW195	6/05/2021	1.61	10.679	16.74	15.13	NR	1.05	42.2	27.43	5.92			27.6	Medium	Brown/Light Brown	Organic Odour	NR	Hydrasleeve
MW195	11/11/2021	2.351	11.28	16.74	14.389	Good	2.24	24.8	16	4.04	281.6	487.4	30.8	Low	Light Brown	No odour	NR	Hydrasleeve
MW195	3/03/2022	1.157	11.275	16.74	15.583	NR	1.78	62.8	40.82	5	149.3	355.1	31.3	Clear	Light Orange/White/Brown	No Odour	NR	Hydrasleeve
MW195	27/09/2022	2.910	11.26	16.74	13.828	Good	1.45	37.2	22.32	4.56	160.1	365.9	29.8	Low	Orange	No odour	No sheen	Hydrasleeve
MW195	17/03/2023	1.590	11.16	16.74	15.148	Good	0.89	98	59	5.60	14.7	220.5	30.3	Moderate	Brown	No odour	No sheen	Hydrasleeve
MW197	3/11/2020	11.612	14.113	26.2	14.588	NR	0.99	121.1	78.715	5.05	226.2	432	30.6	Medium	Light Grey	No Odour	No Sheen	Hydrasleeve
MW197	29/04/2021	6.085	15.04	26.2	20.115	NR	0.49	68.3	44.395	4.89	116	321.8	31	Turbid	Brown	No Odour	NR	Hydrasleeve
MW197	9/11/2021	13.225	15.78	26.20	12.975	Good	2.72	105	68	6.65	214.3	420.1	30.9	Low	Light Grey	Slight Organic Odour	NR	Hydrasleeve
MW197	3/03/2022	3.826	15.78	26.2	22.374	NR	1.5	66.1	42.965	5.42	34.2	240	29.6	Clear	Clear	Slight Organic Odour	NR	Hydrasleeve
MW197	27/09/2022	Dry	15.84	26.20	NA	Good	NM	NM	NM	NM	NM	NM	NM	NR	NR	NR	NR	Hydrasleeve
MW197	13/03/2023	3.740	7.65	NA	NA	Good	2.44	33	20	4.45	15.2	221	29.1	High	Brown	No odour	No sheen	Hydrasleeve
MW200	2/11/2020	5.8	10.36	26.23	20.43	NR	1.22	55.6	36.14	5.36	152.6	358.4	31	Medium	Light Brown	Slight Organic Odour	No Sheen	Hydrasleeve
MW200	28/04/2021	5.4	12.691	26.23	20.83	NR	0.86	97.7	63.505	5.52	187.7	393.5	30.1	Turbid	Grey	Organic Odour	NR	Hydrasleeve
MW200	11/11/2021	6.501	11.73	26.23	19.729	Good	0.81	173.6	113	5.18	174.8	380.6	31.8	Low	Light Brown	No odour	NR	Hydrasleeve
MW200	2/03/2022	4.124	12.731	26.23	22.106	NR	2.07	61.5	39.975	4.66	129.1	334.9	30.9	Clear	Light Brown	No Odour	NR	Hydrasleeve
MW200	26/09/2022	6.750	11.72	26.23	19.483	Good	0.97	38.4	23.04	4.53	161.2	367	29.5	Low	Grey	No odour	No sheen	Hydrasleeve
MW200	16/03/2023	4.340	11.63	26.23	21.893	Good	4.38	52	31	4.42	108.3	314.1	30.6	High	Brown	No odour	No sheen	Hydrasleeve
MW201	11/11/2021	2.895	8.10	5.92	3.028	Good	1.03	63307	41150	3.94	275.4	481.2	32.7	Low	Orange / Brown	No odour	NR	Hydrasleeve
MW201	3/03/2022	2.175	8.07	5.92	3.748	NR	2.71	55572.0	36122	5.31	177.8	383.6	31.4	Clear	Orange / clear	No odour	NR	Hydrasleeve
MW205	29/04/2021	4.445	14.84	29.57	25.125	NR	3.15	37.5	24.375	6.08	183.8	389.6	30.9	Turbid	Red/Brown	No Odour	NR	Hydrasleeve
MW205	10/11/2021	9.563	14.95	27.75	18.182	Good	3.55	33.5	22	7.08	255	460.8	30.7	Low	Light Grey	No odour	NR	Hydrasleeve
MW205	7/03/2022	2.88	14.96	29.57	26.69	NR	2.56	38.5	25.025	4.51	114.1	319.9	31.6	Clear	Light Orange/Brown	Slight Organic Odour	NR	Hydrasleeve
MW205	27/09/2022	9.000	14.84	29.57	20.571	Good	2.39	40.8	24.48	4.77	131.5	337.3	31.2	Low	Grey	No odour	No sheen	Hydrasleeve
MW205	13/03/2023	2.600	14.88	29.57	26.971	Good	1.71	40	24	4.70	56.3	262.1	29.4	High	Brown	No odour	No sheen	Hydrasleeve
MW206	3/11/2020	7.613	12.793	NA	NA	NR	3.54	46.1	29.965	4.91	242.9	448.7	30.4	Low	Light Brown	No Odour	No Sheen	Hydrasleeve
MW209	3/11/2020	1.657	9.622	6.97	5.313	NR	1.88	1342	872.3	5.56	46	251.8	31.5	Turbid	Brown	No Odour	No Sheen	Hydrasleeve
MW209	12/12/2020	1.716	11.745	6.97	5.254	NR	1.3	1521	988.65	5.15	88.7	294.5	NM	NR	NR	NR	NR	Hydrasleeve
MW209	26/02/2021	0.848	11.745	6.97	6.122	NR	0.51	1806	1173.9	4.1	287.3	493.1	31.6	NR	NR	NR	NR	Hydrasleeve
MW209	28/04/2021	1.384	14.91	6.97	5.586	NR	0.74	970	630.5	5.78	14	219.8	30.3	Turbid	Brown	Hydrogen Sulfide Odour	NR	Hydrasleeve
MW209	10/11/2021	1.830	11.38	6.94	5.107	Good	1.01	838	545	4.97	94.8	300.6	31.2	Low	Light Brown	No odour	NR	Hydrasleeve
MW209	3/03/2022	0.885	11.325	6.97	6.085	NR	2.38	1450	942.5	5.25	156.6	362.4	32.2	Clear	Orange	No Odour	NR	Hydrasleeve
MW209	26/09/2022	2.020	11.31	6.97	4.949	Good	1.28	1451	870.6	5.21	157.7	363.5	28.9	Moderate	Red-brown	No odour	No sheen	Hydrasleeve
MW209	16/03/2023	1.160	11.50	6.97	5.809	Good	1.23	56	34	4.46	90.6	296.4	29.8	High	Brown	No odour	No sheen	Hydrasleeve
MW210	2/11/2020	2.438	9.18	6.91	4.472	NR	1.98	243.5	158.275	5.8	29.1	234.9	32.2	Turbid	Brown	Organic Odour	No Sheen	Hydrasleeve
MW210	28/04/2021	2.34	12.01	6.91	4.57	NR	0.71	289.6	188.24	6.13	1.4	207.2	31.1	Turbid	Brown	Hydrogen Sulfide Odour	NR	Hydrasleeve
MW210	11/11/2021	2.338	11.59	6.91	4.572	Good	2.96	82.1	53	5.17	184.9	390.7	34	Low	Light Brown	No odour	NR	Hydrasleeve
MW210	3/03/2022	1.894	11

AECOM

Table T - 1 Historical Groundwater Quality Parameters

Client Name: Department of Defence
Project Name: PFAS OMP - RAAF Base Darwin
Project No: 60612561

Location ID	Sampled Date	Depth to Water (mbtoc)	Well Depth (mbtoc)	TOC (mAHD)	Water Elevation (mAHD)	Condition of Gatic	DO (mg/L)	EC (µS/cm)	TDS (calc) (mg/L)	pH	Eh (mV)	Redox (corr) (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method
MW211	26/09/2022	5.950	14.90	22.51	16.563	Good	1.99	471.2	282.72	6.07	160.3	366.1	27.8	Low	Grey	No odour	No sheen	Hydrasleeve
MW211	16/03/2023	3.430	14.94	22.51	19.083	Good	0.99	32	19	4.62	72.3	278.1	30.2	High	Brown	No odour	No sheen	Hydrasleeve
MW215	3/11/2020	7.355	13.2	NA	NA	NR	1.37	112.3	72.995	5.4	73.5	279.3	31.1	Low	Light Grey	No Odour	No Sheen	Hydrasleeve
MW215	11/11/2021	6.041	15.20	26.32	20.276	Good	0.79	38.7	25	4.64	163.3	369.1	30.6	Medium	Orange / Brown	No odour	NR	Hydrasleeve
MW215	27/09/2022	8.140	15.18	26.37	18.231	Good	0.58	68.8	41.28	5.55	75.6	281.4	29.5	Low	Grey	No odour	No sheen	Hydrasleeve
MW215	17/03/2023	5.110	15.22	NA	NA	Good	0.90	94	56	5.38	108.2	314	31.2	High	Brown	No odour	No sheen	Hydrasleeve
MW235	27/09/2022	8.950	14.75	27.55	18.6	Good	0.8	38	22.8	4.82	176.6	382.4	30.1	Low	Grey	No odour	No sheen	Hydrasleeve
MW235	16/03/2023	1.870	13.90	NA	NA	Good	2.21	141	84	3.87	37.0	242.8	30.9	Moderate	Brown	No odour	No sheen	Hydrasleeve
MW240	3/11/2020	NM	15.01	NA	NA	NR	2.36	62.1	40.365	4.38	276.9	482.7	31.1	Low	Clear	No Odour	No Sheen	Hydrasleeve
MW240	10/12/2020	13.205	13.995	NA	NA	NR	2.58	52.1	33.865	4.82	158	363.8	30.6	NR	NR	NR	NR	Hydrasleeve
MW240	1/03/2021	2.51	13.995	NA	NA	NR	0.9	51.5	33.475	4.37	245.9	451.7	32.6	NR	NR	NR	NR	Hydrasleeve
MW240	29/04/2021	4.335	14.44	NA	NA	NR	1.4	97.6	63.44	5.3	97	302.8	33.1	Clear	Clear	No Odour	NR	Hydrasleeve
MW240	3/03/2022	2.287	14.448	NA	NA	NR	2.35	53.6	34.84	5.24	94.2	300	30.9	Clear	Slightly Orange	No Odour	NR	Hydrasleeve
MW240	27/09/2022	Dry	14.56	25.60	NA	Good	NM	NM	NM	NM	NM	NM	NM	NR	NR	NR	NR	Hydrasleeve
MW240	13/03/2023	2.220	14.21	NA	NA	No cap	4.21	31	18	4.59	-22.1	183.7	30.3	High	Brown	No odour	No sheen	Hydrasleeve
MW241	3/11/2020	11.969	12.821	NA	NA	NR	2.31	140.3	91.195	4.32	268.5	474.3	30.2	Low	Clear	No Odour	No Sheen	Hydrasleeve
MW241	10/12/2020	13.58	15	NA	NA	NR	Not Able to Sample - Dry											
MW241	1/03/2021	2.052	15	NA	NA	NR	2.94	44.1	28.665	3.9	217	422.8	32.3	NR	NR	NR	NR	Hydrasleeve
MW241	29/04/2021	3.723	14.45	NA	NA	NR	1.98	49.7	32.305	4.51	213.1	418.9	32.9	Turbid	Grey	No Odour	NR	Hydrasleeve
MW241	3/03/2022	1.864	14.468	NA	NA	NR	3.39	51.5	33.475	4.8	150.1	355.9	30.6	Clear	Brown/Orange	Slight Organic Odour	NR	Hydrasleeve
MW241	27/09/2022	Dry	14.58	25.01	NA	Good	NM	NM	NM	NM	NM	NM	NM	NR	NR	NR	NR	Hydrasleeve
MW241	13/03/2023	1.820	14.45	NA	NA	Good	4.17	85	51	4.61	-75.0	130.8	30	High	Brown	No odour	No sheen	Hydrasleeve
MW297	2/11/2020	8.605	13.53	29.53	20.925	NR	1.43	42.6	27.69	4.75	98.3	304.1	31.7	Low	Clear	Hydrocarbon Odour	Slight Sheen	Hydrasleeve
MW297	15/02/2021	3.329	14.88	29.53	26.201	NR	NM	NM	NM	NM	NM	NM	NM	NR	NR	No Odour	NR	Hydrasleeve
MW297	29/04/2021	6.638	15.21	29.53	22.892	NR	0.65	54.7	35.555	4.53	182.1	387.9	32.1	Clear	Clear	Hydrocarbon Odour	NR	Hydrasleeve
MW297	11/11/2021	8.394	NAPL	29.53	21.136	Good	1.12	33.9	22	6.09	69.3	275.1	30.8	Clear	Clear	HC odour	NR	Hydrasleeve. LNAPL level will affect depth to water level.
MW297	4/03/2022	4.118	15.22	29.53	25.412	NR	2.7	45.1	29.315	4.73	174.1	379.9	30.5	Clear	Clear	Hydrocarbon Odour	NR	Hydrasleeve
MW297	27/09/2022	10.490	15.33	29.53	19.04	Good	0.53	45.6	27.36	5.15	54.8	260.6	30.4	Low	Grey	Hydrocarbon	Hydrocarbon	Hydrasleeve
MW297	13/03/2023	NM	NM	29.53	NA	Good	4.01	35	21	4.80	49.7	255.5	30.6	High	Grey	No odour	No sheen	Hydrasleeve
MW303	3/11/2020	11.329	13.094	31.94	20.611	NR	1.2	388.5	252.525	5.75	-47.6	158.2	32.6	Low	Clear	Hydrocarbon Odour	No Sheen	Hydrasleeve
MW303	15/02/2021	5.37	15.54	31.94	26.57	NR	0.07	114.8	74.62	5.58	-24.4	181.4	32.5	Clear	Clear	Hydrocarbon Odour	No Sheen	Hydrasleeve
MW303	29/04/2021	8.428	15.53	31.94	23.512	NR	0.36	333.4	216.71	5.53	-62.9	142.9	33.1	Clear	Clear	Hydrocarbon Odour	NR	Hydrasleeve
MW303	9/11/2021	12.628	NAPL	31.94	19.312	Good	1.13	324.8	211	5.55	-16.7	189.1	33.1	Low	Light Brown	HC odour	NR	Hydrasleeve. LNAPL level will affect depth to water level.
MW303	4/03/2022	6.149	15.5	31.94	25.791	NR	2.37	295.2	191.88	6.4	24	229.8	32.4	Clear	Clear	Hydrocarbon Odour	NR	Hydrasleeve
MW303	27/09/2022	12.530	15.70	31.94	19.41	Good	0.78	330.4	198.24	6.07	-34.5	171.3	30.4	Low	Grey	Hydrocarbon	Hydrocarbon	Hydrasleeve
MW303	16/03/2023	6.330	15.46	31.94	25.61	Good	1.94	44	27	4.71	67.7	273.5	31.8	High	Brown	No odour	No sheen	Hydrasleeve
MW422	2/11/2020	5.982	11.009	27.77	21.788	NR	3.5	42.2	27.43	5.14	251.5	457.3	32.6	Low	Yellow	No Odour	No Sheen	Hydrasleeve
MW422	6/05/2021	3.22	11.009	27.77	24.55	NR	2.88	44.2	28.73	5.83	259.9	465.7	31.8	Clear	Clear/Light Grey	No Odour	NR	Hydrasleeve
MW422	10/11/2021	7.258	12.87	27.77	20.512	Good	2.95	30.7	20	4.30	266.6	472.4	32.9	Low	Light Brown	No odour	NR	Hydrasleeve
MW422	4/03/2022	1.71	14.81	27.77	26.06	NR	1.71	57.6	37.44	5.2	146.8	352.6	32.7	Clear	Brown/Orange	No Odour	NR	Hydrasleeve
MW451	27/09/2022	4.870	15.71	12.98	8.108	Good	0.99	88.4	53.04	5.23	155	360.8	30.1	Low	Grey	No odour	No sheen	Hydrasleeve
MW451	17/03/2023	3.180	15.60	12.98	9.798	Good	0.73	77	46	4.73	106.3	312.1	31.6	Moderate	Brown	No odour	No sheen	Hydrasleeve
MW452	27/09/2022	2.730	13.45	11.39	8.66	Good	1.75	62.9	37.74	5.05	152.3	358.1	31.1	Low	Grey	No odour	No sheen	Hydrasleeve
MW452	17/03/2023	2.000	13.35	11.39	9.39	Good	4.01	35	21	4.52	49.3	255.1	30.6	Moderate	Brown	No odour	No sheen	Hydrasleeve
MW453	27/09/2022	Dry	15.11	17.13	NA	Good	NM	NM	NM	NM	NM	NM	NM	NR	NR	NR	NR	Hydrasleeve
MW453	13/03/2023	1.720	15.08	NA	NA	Good	3.61	31	19	4.29	65.7	271.5	30.7	Moderate	Grey	No odour	No sheen	Hydrasleeve
MW454	27/09/2022	7.55	12.03	26.27	18.718	Good	0.93	48.4	29.04	4.29	215.2	421	31.1	Low	Grey	No odour	No sheen	Hydrasleeve
MW454	16/03/2023	1.780	12.01	26.27	24.488	Good	1.28	157	94	4.68	64.1	269.9	29.5	Low	Orange	No odour	No sheen	Hydrasleeve

Notes
1. NM = not measured, applies to numerical values
2. NA = Not available, either through lack of survey or DTW measurement.
3. NR = Not recorded, applies to observations

Table T2
Current and Historical Groundwater Analytical Results
Department of Defence
PFAS OMP - RAAF Base Darwin

AECOM

				PFAS (Full Suite)																												
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	PFOSA	PFPeS	PFPeA	PFTrDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																	
PFAS NEMP (2020) FW 99% Species Protection																															0.00023	19	
Human Health Receptors																																	
PFAS NEMP (2020) Human Health Drinking Water																															0.07	0.56	
Location Code	**Sample Date**	**Field ID**	**Sample Type**																														
MW103	24/07/2017	1302_MW103_170724	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.29	0.07	<0.02	<0.02	<0.02	0.29	0.10	0.79	0.01	<0.05	0.37	0.18	<0.02	<0.02	<0.05	19.65	17.30	13.00	0.25	4.30
MW103	23/08/2017	1302_MW103_170823	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.30	0.08	<0.02	<0.02	<0.02	0.23	0.14	0.81	0.01	<0.05	0.34	0.17	<0.02	<0.02	<0.05	15.09	12.70	8.20	0.31	4.50
MW103	14/11/2017	1302_MW103_171114	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	0.01	0.07	<0.02	<0.05	0.04	0.02	<0.02	<0.02	<0.05	2.17	1.96	1.40	0.02	0.56
MW103	8/03/2018	1302_MW103_180308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	0.07	<0.02	<0.02	<0.02	0.20	0.10	0.76	0.01	<0.05	0.35	0.13	<0.02	<0.02	<0.05	19.24	17.20	14.00	0.20	3.20
MW103	13/12/2018	1302_MW103_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.10	0.10	<0.02	<0.02	<0.02	0.14	0.08	0.70	<0.02	<0.05	0.19	0.17	<0.02	<0.02	<0.05	18.39	16.70	14.00	0.21	2.70
MW103	20/03/2019	1302_MW103_190320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	0.07	<0.02	<0.02	<0.02	0.25	0.08	0.58	<0.02	<0.05	0.34	0.12	<0.02	<0.02	<0.05	13.09	11.10	8.10	0.18	3.00
MW103	16/12/2019	1302_MW103_191216	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	<0.1	<0.02	<0.02	<0.02	0.25	0.09	0.86	<0.02	<0.05	0.39	0.15	<0.02	<0.02	<0.05	23.90	21.70	17.50	0.23	4.16
MW103	16/04/2020	1302_MW103_200415	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.28	<0.1	<0.02	<0.02	<0.02	0.27	0.12	0.91	<0.02	0.02	0.32	0.16	<0.02	<0.02	<0.05	18.40	16.00	11.90	0.28	4.10
MW103	2/11/2020	1302_MW103_201102	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.57	<0.1	0.10	<0.02	<0.02	0.88	0.28	1.92	<0.02	0.11	1.16	0.19	<0.02	<0.02	<0.05	48.00	42.00	30.60	0.79	11.40
MW103	29/04/2021	1302_MW103_210429	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.39	<0.1	<0.02	<0.02	<0.02	0.48	0.19	1.61	<0.02	0.02	0.79	0.26	<0.02	<0.02	<0.05	32.10	27.90	17.30	0.44	10.60
MW103	11/11/2021	Intralab Dup	Intralab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.67	0.10	<0.02	<0.02	<0.02	0.63	0.25	2.33	<0.02	<0.05	0.94	0.31	<0.02	<0.02	<0.05	47.7	41.80	31	0.68	10.80
MW103	11/11/2021	1302_QC202_211111	Interlab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.54	0.14	<0.02	<0.02	<0.02	0.37	0.20	1.40	<0.02	<0.05	0.64	0.26	<0.02	<0.02	<0.05	35.46	31.40	24.00	0.51	10.80
MW103	11/11/2021	1302_MW103_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.69	0.1	<0.02	<0.02	<0.02	0.65	0.26	2.42	<0.02	<0.05	0.96	0.31	<0.02	<0.02	<0.05	49.9	43.80	33.2	0.69	10.60
MW103	7/03/2022	1302_MW103_220307	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.25	<0.1	<0.02	<0.02	<0.02	0.29	0.09	0.95	<0.02	<0.05	0.35	0.15	<0.02	<0.02	<0.05	24.30	21.90	17.30	0.28	4.64
MW103	29/09/2022	1302_MW103_220929	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.97	0.1	0.04	<0.02	<0.02	0.9	0.44	3.95	0.02	<0.02	1.98	0.38	<0.05	<0.02	<0.02	58.5	48.60	28.8	1.11	19.8
MW103	23/03/2023	1302_MW103_230323	Primary	4.62	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	0.20	<0.02	<0.02	<0.02	0.29	0.16	1.14	<0.02	<0.05	0.26	1.09	<0.05	<0.02	<0.02	22.30	14.10	10.90	0.23	3.21
MW107	10/07/2017	1302_MW107_170710	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.32	0.09	<0.02	<0.02	<0.02	0.61	0.12	0.91	<0.02	<0.05	0.52	0.19	<0.02	<0.02	<0.05	17.15	14.10	10.00	0.29	4.10
MW107	29/08/2017	1302_MW107_170829	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.37	0.09	<0.02	<0.02	<0.02	0.28	0.10	0.76	<0.02	<0.05	0.47	0.17	<0.02	<0.02	<0.05	14.55	12.10	8.30	0.21	3.80
MW107	14/11/2017	1302_MW107_171114	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.32	0.12	<0.02	<0.02	<0.02	0.35	0.13	0.73	<0.02	<0.05	0.49	0.18	<0.02	<0.02	<0.05	17.38	14.80	10.00	0.26	4.80
MW107	12/01/2018	1302_MW107_180112	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.30	0.09	<0.02	<0.02	<0.02	0.21	0.12	0.77	<0.02	<0.05	0.43	0.19	<0.02	<0.02	<0.05	14.10	11.80	7.90	0.19	3.90
MW107	8/03/2018	1302_MW107_180308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	0.08	<0.02	<0.02	<0.02	0.18	0.09	0.59	<0.02	<0.05	0.34	0.18	<0.02	<0.02	<0.05	10.61	8.80	6.10	0.17	2.70
MW107	13/12/2018	1302_MW107_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.30	0.10	<0.02	<0.02	<0.02	0.23	0.09	0.69	<0.02	<0.05	0.51	0.20	<0.02	<0.02	<0.05	16.19	13.90	9.60	0.17	4.30
MW107	20/03/2019	1302_MW107_190320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.32	0.10	<0.02	<0.02	<0.02	0.27	0.10	0.62	<0.02	<0.05	0.42	0.17	<0.02	<0.02	<0.05	11.40	9.10	6.10	0.16	3.00
MW107	16/12/2019	1302_MW107_191216	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.33	<0.1	<0.02	<0.02	<0.02	0.24	0.09	0.70	<0.02	<0.05	0.42	0.14	<0.02	<0.02	<0.05	11.70	9.71	6.28	0.15	3.38
MW107	16/04/2020	1302_MW107_200414	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.41	<0.1	<0.02	<0.02	<0.02	0.23	0.13	0.93	<0.02	<0.05	0.40	0.16	<0.02	<0.02	<0.05	12.90	10.40	6.40	0.22	3.98
MW107	2/11/2020	1302_MW107_201102	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.32	<0.1	<0.02	<0.02	<0.02	0.39	0.13	0.71	<0.02	<0.05	0.52	0.12	<0.02	<0.02	<0.05	13.30	10.90	6.95	0.24	3.93
MW107	29/04/2021	1302_MW107_210429	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.26	<0.1	<0.02	<0.02	<0.02	0.22	0.09	0.66	<0.02	<0.05	0.36	0.13	<0.02	<0.02	<0.05	11.50	9.58	6.23	0.16	3.35
MW107	11/11/2021	1302_MW107_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.46	<0.1	<0.02	<0.02	<0.02	0.30	0.13	1.07	<0.02	<0.05	0.51	0.19	<0.02	<0.02	<0.05	16.10	13.20	8.51	0.27	4.70
MW107	9/03/2022	1302_MW107_220309	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	<0.1	<0.02	<0.02	<0.02	0.20	0.07	0.79	<0.02	<0.05	0.33	0.16	<0.02	<0.02	<0.05	10.40	8.46	5.40	0.16	3.06
MW107	29/09/2022	1302_MW107_220929	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	<0.1	<0.02	<0.02	<0.02	0.2	0.08	0.67	<0.02	<0.02	0.33	0.12	<0.05	<0.02	<0.02	10.9	9.11	6.36	0.17	2.75
MW107	23/03/2023	1302_MW107_230323	Primary	3.92	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.25	0.30	<0.02	<0.02	<0.02	0.21	0.16	1.12	<0.02	<0.02	0.32	1.09	<0.05	<0.02	<0.02	19.50	11.80	8.66	0.22	3.18
MW112	3/08/2017	1302_MW112_170803	Primary	<0.05	<0.05	<0.05	0.03	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.61	0.16	0.02	<0.02	<0.02	0.37	0.16	1.40	0.01	<0.05	0.59	0.25	<0.02	<0.02	<0.05	28.43	24.50	20.00	0.33	4.50
MW112	3/08/2017	1302_QCGW2_170803	Interlab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.30	<0.1	<0.02	<0.02	<0.02	0.26	0.10	0.66	<0.02	<0.05	0.33	0.13	<0.02	<0.02	<0.05	13.80	11.90	8.82	0.21	3.04
MW112	24/08/2017	1302_MW112_170824	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.52	0.14	<0.02	<0.02	<0.02	0.26	0.14	1.30	<0.02	<0.05	0.55	0.28	<0.02	<0.02	<0.05	24.18	20.70	15.00	0.29	5.70
MW112	13/11/2017	1302_MW112_171113	Primary	<0.05	<0.05	<0.05	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.46	0.13	<0.02	<0.02	<0.02	0.24	0.20	1.30	<0.02	<0.05	0.58	0.28	<0.02	<0.02	<0.05	23.45	19.90	14.00	0.34	5.90
MW112	12/01/2018	1302_MW112_180112	Primary	<0.05	<0.05	<0.05	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.43	0.12	<0.02	<0.02	<0.02	0.27	0.12	1.00	<0.02	<0.05	0.49	0.18	<0.02	<0.02	<0.05	21.28	18.40	15.00	0.25	4.40
MW112	6/03/2018	1302_MW112_180306	Primary	<0.05	<0.05	<0.05	0.01	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.35	0.09	0.03	<0.02	<0.02	0.36	0.09	0.88	<0.02	<0.05	0.39	0.14	<0.02	<0.02	<0.05	13.03	10.50	7.80	0.19	2.70
MW112	15/12/2018	1302_MW112_181215	Primary	<0.05	<0.05	<0.05	0.03	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.49	0.16	0.02	<0.02	0.01	0.69	0.18	1.40	<0.02	<0.05	0.41	0.24	0.05	0.02	<0.05	32.51	28.50	23.00	0.31	5.50
MW112	20/03/2019	1302_MW112_190320	Primary	<0.05	<0.05	<0.05	0.01	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.27	0.09	<0.02	<0.02	<0.02	0.18	0.07	0.57	<0.02	<0.05	0.25	0.11	<0.02	<0.02	<0.05	10.38	8.50	6.60	0.13	1.90
MW112	17/12/2019	1302_MW112_191217	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.51	0.10	<0.02	<0.02	<0.02	0.35	0.14	1.18	<0.02	<0.05	0.42	0.21	<0.02	<0.02	<0.05	20.80	17.60	13.70	0.28	3.89
MW112	16/04/2020	1302_MW112_200414	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.58	0.10	<0.02	<0.02	<0.02	0.39	0.14	1.37	<0.02	<0.05	0.43	0.20	<0.02	<0.02	<0.05	20.60	17.10	12.80	0.32	4.28
MW112	13/11/2020	1302_MW112_201103	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.46	0.10	0.02	<0.02	<0.02	0.36	0.13	1.05	<0.02	<0.05	0.56	0.19	<0.02	<0.02	<0.05	23.50	20.30	16.10	0.31	4.24
MW112	29/04/2021	1302_MW112_210428	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.41	<0.1	<0.02	<0.02	<0.02	0.28	0.12	1.04	<0.02	<0.05	0.44	0.18	<0.02	<0.02	<0.05	15.60	12.90	9.18	0.22	3.73
MW112	10/11/2021	1302_MW112_211110	Primary	<0.05	<0.05	<0.05	0.06	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.43	<0.1	0.06	<0.02	<0.02	0.42	0.13	1.23	<0.02	0.05	0.55	0.16	<0.02	<0.02	<0.05	25.20	21.80	18.20	0.32	3.64
MW112	10/03/2022	1302_MW112_220310	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.32	<0.1	<0.02	<0.02	<0.02	0.16	0.06	0.90	<0.02	<0.05	0.30	0.14	<0.02	<0.02	<0.05	11.20	9.14	6.88	0.16	2.26
MW112	10/10/2022	1302_MW112_221010	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.34	<0.1	0.03	<0.02	<0.02	0.27	0.11	0.86	<0.02	0.04	0.35	0.16	<0.05	<0.02	<0.02	20.4	17.9	14.8	0.29	3.13
MW112	14/03/2023	1302_MW112_230314	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	<0.1	<0.02	<0.02	<0.02	0.12	0.07	0.60	<0.02	<0.02	0.23	0.11	<0.05	<0.02	<0.02	9.74	8.23	6.42	0.15	1.81
MW115	3/08/2017	1302_MW115_170803	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	4.30	0.89	0.02	<0.02	<0.02	2.30	0.83	7.90	0.03	<0.05	4.00	1.70	<0.02	<0.02	<0.05	135.07	111.00	80.00	2.10	31.00
MW115	24/08/2017	1302_MW115_170824	Primary	<0.05	<0.05	0.06	0.04	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	5.70	1.40	<0.02	0.01	<0.02	6.40	1.20	10.00	0.03	<0.05	5.10	2.90	<0.02	<0.02	<0.05	421.84	386.00	340.00	3.00	46.00
MW115	13/11/2017	1302_MW115_171113	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	7.40	1.70	<0.02	<0.02	<0.02	6.90	1.70	14.00	<0.02	<0.05	6.20	3.60	<0.02	<0.02	<0.05	362.60	317.00	260.00	4.10	57.00
MW115	12/01/2018	1302_MW115_180112	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.70	0.70	<0.02	<0.02	<0.02	2.70	0.71	6.80	<0.02	<0.05	4.00	1.40	<0.02	<0.02	<0.05	179.91	158.00	130.00	1.90	28.00
MW115	6/03/2018	1302_MW115_180306	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.30	0.37	0.06	<0.02	<0.02	3.00	0.44	4.10	0.02	<0.05	2.70	0.77	<0.02	<0.02	<0.05	83.06	68.00	52.00	1.30	16.00
MW115	9/05/2018	1302_MW115_7_180509	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.10	0.68	<0.02	<0.02	<0.02	2.30	0.70	6.70	0.03	0.07	3.20	1.50	<0.02	<0.02	<0.05	142.58	122.00	89.00	2.30	33.00
MW115	9/05/2018	1302_MW115_11_180509	Primary	<0.05	<0.05	<0.05	0.01	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.10	0.73	<0.02	0.01	<0.02	2.70	0.73	7.30	0.04	0.15	3.60	1.50	<0.02	<0.02	0.01	184.28	162.00	130.00	2.40	32.00
MW115	9/05/2018	1302_MW115_13_180509	Primary	<0.05	<0.05	<0.05	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.20	0.73	<0.02	0.02	<0.02	2.50	0.73	7.20	0.03	0.13	3.40	1.50	<0.02	<0.02	<0.05	191.76	170.00	140.00	2.30	30.00
MW115	9/05/2018	1302_MW115_9_180509	Primary	<0.05	<0.05	<0.05	0.01	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.40	0.78	<0.02	<0.02	<0.02	2.60	0.78	7.40	0.03	0.10	3.40	1.70	<0.02	<0.02	<0.05	184.70	162.00	130.00	2.50	32.00
MW115	15/12/2018	1302_MW115_181215	Primary	<0.05	<0.05	0.23	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	6.10	1.40	<0.02	<0.02	<0.02	6.50	1.50	13.00	<0.02	0.25	5.70	2.80	<0.02	<0.02	<0.05	320.28	279.00	220.00	3.80	59.00
MW115	20/03/2019	1302_MW115_190320	Primary	<0.05	<0.05	0.11	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.90	0.60	0.05	<0.02	<0.02	1.50	0.53	4.50	0.02	0.08	2.40	0.98	<0.02	<0.02	<0.05	108.87	91.00	73.00	1.50	18.00

Table T2
Current and Historical Groundwater Analytical Results
Department of Defence
PFAS OMP - RAAF Base Darwin

AECOM

				PFAS (Full Suite)																												
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	PFOSA	PFPeS	PFPeA	PFTrDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																	
PFAS NEMP (2020) FW 99% Species Protection																															0.00023	19	
Human Health Receptors																																	
PFAS NEMP (2020) Human Health Drinking Water																															0.07	0.56	
Location Code	**Sample Date**	**Field ID**	**Sample Type**																														
MW115	17/12/2019	1302_MW115_191217	Primary	<0.05	<0.05	0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	6.64	1.50	0.21	<0.02	<0.02	6.94	1.31	9.60	0.03	0.14	7.24	2.56	<0.02	<0.02	<0.05	340.00	301.00	255.00	3.05	45.80
MW115	16/04/2020	1302_MW115_200414	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.74	0.40	<0.02	<0.02	<0.02	1.88	0.44	5.38	<0.02	0.14	2.52	0.86	<0.02	<0.02	<0.05	110.00	93.80	71.60	1.48	22.20
MW115	3/11/2020	1302_MW115_201103	Primary	<0.05	Nd	<0.05	<0.05	<0.05	<0.02	Nd	<0.05	<0.02	<0.05	5.58	1.20	0.38	<0.02	<0.02	4.82	1.18	10.40	0.04	0.19	6.10	2.15	<0.02	<0.02	<0.05	344.00	309.00	269.00	3.15	40.10
MW115	29/04/2021	1302_MW115_210429	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.76	0.50	0.10	<0.02	<0.02	3.41	0.60	6.76	0.02	0.12	4.36	1.15	<0.02	<0.02	<0.05	131.00	110.00	80.50	1.47	29.40
MW115	10/11/2021	1302_MW115_211110	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.32	0.50	0.23	<0.02	<0.02	3.76	0.67	7.61	0.02	0.34	2.75	1.04	<0.02	<0.02	<0.05	111.00	88.60	62.20	1.82	26.40
MW115	10/03/2022	1302_MW115_220310	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.48	0.60	0.12	<0.02	<0.02	2.33	0.66	6.92	<0.02	0.23	3.21	1.03	<0.02	<0.02	<0.05	106.00	85.20	59.30	1.76	25.90
MW115	14/03/2023	1302_MW115_230314	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.47	0.20	0.06	<0.02	<0.02	1.39	0.34	3.16	<0.02	0.10	2.12	0.56	<0.05	<0.02	<0.02	74.00	63.60	47.30	1.01	16.30
MW115	14/03/2023	1302_QC100_230314	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.63	0.20	0.07	<0.02	<0.02	1.65	0.38	3.51	<0.02	0.10	2.35	0.63	<0.05	<0.02	<0.02	76.20	64.50	47.60	1.14	16.90
MW115	14/03/2023	1302_QC200_230314	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	1.30	0.27	<0.01	<0.01	<0.01	0.99	0.27	2.30	<0.01	0.03	1.40	0.44	<0.02	<0.02	<0.01	21.70	44.00	30.00	0.79	14.00
MW128	24/07/2017	1302_MW128_170724	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.26	0.06	<0.02	<0.02	<0.02	0.19	0.07	0.54	<0.02	<0.05	0.28	0.12	<0.02	<0.02	<0.05	11.26	9.60	7.10	0.14	2.50
MW128	1/09/2017	1302_MW128_170901	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	0.07	<0.02	<0.02	<0.02	0.22	0.09	0.60	<0.02	<0.05	0.37	0.14	<0.02	<0.02	<0.05	11.89	10.00	6.80	0.17	3.20
MW128	16/11/2017	1302_MW128_171116	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	0.09	<0.02	<0.02	<0.02	0.24	0.09	0.57	<0.02	<0.05	0.33	0.13	<0.02	<0.02	<0.05	12.29	10.40	7.10	0.20	3.30
MW128	15/01/2018	1302_MW128_180115	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.31	0.07	<0.02	<0.02	<0.02	0.14	0.07	0.61	<0.02	<0.05	0.36	0.14	<0.02	<0.02	<0.05	11.57	9.70	6.80	0.17	2.90
MW128	8/03/2018	1302_MW128_180308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.29	0.07	<0.02	<0.02	<0.02	0.18	0.08	0.57	<0.02	<0.05	0.34	0.11	<0.02	<0.02	<0.05	12.81	11.00	8.00	0.17	3.00
MW128	9/05/2018	1302_MW128_4_180509	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.30	0.07	<0.02	<0.02	<0.02	0.27	0.10	0.68	0.01	<0.05	0.38	0.14	<0.02	<0.02	<0.05	12.15	10.00	6.20	0.20	3.80
MW128	9/05/2018	1302_MW128_12_180509	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.33	0.09	<0.02	<0.02	<0.02	0.34	0.11	0.77	0.01	<0.05	0.43	0.15	<0.02	<0.02	<0.05	14.76	12.30	8.00	0.23	4.30
MW128	9/05/2018	1302_MW128_8_180509	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.34	0.10	<0.02	<0.02	<0.02	0.33	0.11	0.75	0.01	<0.05	0.43	0.15	<0.02	<0.02	<0.05	15.34	12.90	8.60	0.22	4.30
MW128	13/12/2018	1302_MW128_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.19	<0.1	<0.02	<0.02	<0.02	0.18	0.05	0.29	<0.02	<0.05	0.29	0.06	<0.02	<0.02	<0.05	11.38	10.20	7.40	0.12	2.80
MW128	21/03/2019	1302_MW128_190321	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	0.08	<0.02	<0.02	<0.02	0.14	0.08	0.59	<0.02	<0.05	0.27	0.15	<0.02	<0.02	<0.05	9.71	7.90	5.20	0.18	2.70
MW128	17/12/2019	1302_MW128_191217	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	<0.1	<0.02	<0.02	<0.02	0.17	0.07	0.52	<0.02	<0.05	0.28	0.12	<0.02	<0.02	<0.05	9.92	8.41	5.92	0.13	2.49
MW128	16/04/2020	1302_MW128_200415	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.29	<0.1	<0.02	<0.02	<0.02	0.20	0.08	0.72	<0.02	<0.05	0.26	0.13	<0.02	<0.02	<0.05	11.20	9.29	6.39	0.18	2.90
MW128	3/11/2020	1302_MW128_201103	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.30	<0.1	<0.02	<0.02	<0.02	0.24	0.10	0.71	<0.02	<0.05	0.39	0.16	<0.02	<0.02	<0.05	14.20	12.00	8.49	0.21	3.55
MW128	6/05/2021	1302_MW128_210506	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.14	0.06	0.47	<0.02	<0.05	0.22	0.12	<0.02	<0.02	<0.05	6.97	5.67	3.56	0.13	2.11
MW128	11/11/2021	1302_MW128_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	<0.1	<0.02	<0.02	<0.02	0.13	0.07	0.53	<0.02	<0.05	0.21	0.11	<0.02	<0.02	<0.05	8.88	7.50	5.35	0.12	2.15
MW128	7/03/2022	1302_MW128_220307	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	<0.1	<0.02	<0.02	<0.02	0.10	0.04	0.40	<0.02	<0.05	0.17	0.08	<0.02	<0.02	<0.05	6.63	5.59	4.00	0.10	1.59
MW128	7/03/2022	1302_QC200_220307	Interlab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	0.05	<0.02	<0.02	<0.02	0.09	0.05	0.31	<0.02	<0.05	0.14	0.08	<0.02	<0.02	<0.05	4.63	3.68	2.70	0.09	0.98
MW128	7/03/2022	1302_QC100_220307	Intralab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.10	0.04	0.40	<0.02	<0.05	0.17	0.09	<0.02	<0.02	<0.05	6.72	5.66	4.09	0.10	1.57
MW128	10/10/2022	1302_MW128_221010	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	<0.1	<0.02	<0.02	<0.02	0.16	0.08	0.56	<0.02	<0.02	0.27	0.14	<0.05	<0.02	<0.02	10.8	9.11	6.48	0.19	2.63
MW128	23/03/2023	1302_MW128_230323	Primary	<0.05	<0.05	0.15	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.10	0.04	0.28	<0.02	<0.02	0.13	0.10	<0.05	<0.02	<0.02	6.53	5.52	4.23	0.10	1.29
MW133	7/08/2017	1302_MW133_170807	Primary	<0.05	<0.05	0.42	0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.00	0.29	<0.02	<0.02	<0.02	1.30	0.35	3.80	0.02	<0.05	1.30	0.76	<0.02	<0.02	<0.05	82.23	72.00	62.00	0.94	10.00
MW133	28/08/2017	1302_MW133_170828	Primary	<0.05	<0.05	0.37	0.04	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.93	0.25	<0.02	<0.02	<0.02	1.10	0.29	3.20	0.01	0.12	1.10	0.56	<0.02	<0.02	<0.05	68.71	60.00	51.00	0.74	9.00
MW133	15/11/2017	1302_MW133_171115	Primary	<0.05	<0.05	0.17	0.04	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.63	0.18	<0.02	<0.02	<0.02	0.91	0.26	3.20	0.02	0.07	0.85	0.40	<0.02	<0.02	<0.05	68.85	61.40	53.00	0.72	8.40
MW133	12/01/2018	1302_MW133_180112	Primary	<0.05	<0.05	0.27	0.07	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.35	0.19	<0.02	<0.02	<0.02	0.66	0.27	3.00	0.02	0.07	0.55	0.63	<0.02	<0.02	<0.05	58.44	51.80	45.00	0.56	6.80
MW133	12/01/2018	1302_QCMW15_180112	Intralab Dup	<0.05	<0.05	0.26	0.07	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.34	0.20	<0.02	0.01	<0.02	0.64	0.28	3.00	0.02	0.08	0.55	0.59	<0.02	<0.02	<0.05	60.93	54.30	47.00	0.59	7.30
MW133	7/03/2018	1302_MW133_180307	Primary	<0.05	<0.05	0.07	0.07	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.10	0.32	<0.02	<0.02	<0.02	1.60	0.44	4.40	0.03	<0.05	1.50	0.72	<0.02	<0.02	<0.05	123.45	112.00	99.00	1.20	13.00
MW133	8/05/2018	1302_MW133_8_180508	Primary	<0.05	<0.05	0.05	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.38	0.12	0.02	0.01	<0.02	0.59	0.15	1.70	0.02	<0.05	0.77	0.25	<0.02	<0.02	<0.05	38.33	33.80	29.00	0.45	4.80
MW133	8/05/2018	1302_MW133_11_180508	Primary	<0.05	<0.05	0.05	0.03	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.39	0.12	0.04	<0.02	<0.02	0.57	0.15	1.70	0.01	0.06	0.71	0.24	<0.02	<0.02	<0.05	44.02	39.50	35.00	0.45	4.50
MW133	8/05/2018	1302_MW133_14_180508	Primary	<0.05	<0.05	0.09	0.03	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.59	0.18	0.05	0.01	<0.02	1.30	0.24	3.00	0.01	0.09	1.30	0.42	<0.02	<0.02	<0.05	78.70	70.60	62.00	0.79	8.60
MW133	13/12/2018	1302_MW133_181213	Primary	<0.05	<0.05	0.38	0.10	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.66	0.29	0.04	0.02	<0.02	2.10	0.47	13.00	0.03	0.07	1.10	0.79	<0.02	<0.02	<0.05	101.35	81.00	68.00	1.30	13.00
MW133	13/12/2018	1302_QCMW3_181213	Intralab Dup	<0.05	<0.05	0.42	0.12	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.87	0.30	0.73	0.02	<0.02	1.10	0.48	4.50	0.03	0.22	2.50	0.81	<0.02	<0.02	<0.05	146.50	133.00	120.00	1.40	13.00
MW133	20/03/2019	1302_MW133_190320	Primary	<0.05	<0.05	0.08	0.04	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.54	0.18	0.03	<0.02	<0.02	1.10	0.28	2.00	0.01	0.08	0.91	0.33	<0.02	<0.02	<0.05	46.70	39.80	34.00	0.53	5.80
MW133	6/05/2021	1302_MW133_210506	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.31	<0.1	0.04	<0.02	<0.02	0.35	0.11	1.09	<0.02	0.03	0.39	0.19	<0.02	<0.02	<0.05	17.60	14.80	11.50	0.27	3.33
MW133	11/11/2021	1302_MW133_211111	Primary	<0.05	<0.05	0.15	0.06	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.62	0.1	0.03	<0.02	<0.02	0.74	0.22	3.02	<0.02	0.04	0.64	0.39	<0.02	<0.02	<0.05	42.20	35.70	28.50	0.54	7.16
MW133	8/03/2022	1302_MW133_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.50	0.10	0.05	<0.02	<0.02	0.70	0.20	2.35	<0.02	0.06	0.66	0.32	<0.02	<0.02	<0.05	42.20	36.70	30.40	0.53	6.32
MW133	21/10/2022	1302_MW133_221021	Primary	<0.05	<0.05	0.14	0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.62	0.2	0.03	<0.02	<0.02	0.96	0.31	2.79	<0.02	0.04	0.88	0.49	<0.05	<0.02	<0.02	63.4	56	47.2	0.8	8.84
MW133	15/03/2023	1302_MW133_230315	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.45	0.20	0.10	<0.02	<0.02	0.92	0.21	1.92	<0.02	0.06	0.73	0.39	<0.05	<0.02	<0.02	42.90	37.40	30.40	0.56	6.98
MW139	24/07/2017	1302_MW139_170724	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.12	0.02	0.19	<0.02	<0.05	0.13	0.05	<0.02	<0.02	<0.05	5.73	5.06	4.10	0.05	0.96
MW139	28/08/2017	1302_MW139_170828	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	<0.1	<0.02	<0.02	<0.02	0.14	0.03	0.23	<0.02	<0.05	0.15	0.05	<0.02	<0.02	<0.05	7.22	6.40	5.20	0.07	1.20
MW139	15/11/2017	1302_MW139_171115	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	<0.1	<0.02	<0.02	<0.02	0.11	0.03	0.23	<0.02	<0.05	0.15	0.05	<0.02	<0.02	<0.05	6.48	5.70	4.50	0.06	1.20
MW139	12/01/2018	1302_MW139_180112	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	0.01	0.07	<0.02	<0.05	0.03	0.02	<0.02	<0.02	<0.05	1.74	1.54	1.30	0.02	0.24
MW139	7/03/2018	1302_MW139_180307	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	0.01	<0.02	<0.02	<0.02	<0.05	0.60	0.56	0.43	<0.01	0.13
MW139	13/12/2018	1302_MW139_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.08	0.02	0.15	<0.02	<0.05	0.08	0.04	<0.02	<0.02	<0.05	4.50	4.02	3.20	0.04	0.82
MW139	20/03/2019	1302_MW139_190320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.01	<0.02	<0.02	<0.02	<0.05	0.65	0.59	0.42	<0.01	0.17
MW139	17/12/2019	1302_MW139_191217	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.05	<0.02	0.12	<0.02	<0.05	0.08	0.02	<0.02	<0.02	<0.05	2.67	2.31	1.70	0.02	0.61
MW139	16/04/2020	1302_MW139_200414	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.76	0.71	0.51	0.01	0.20
MW139	4/11/2020	1302_MW139_201104	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.10	<0.02	<0.05	0.07	<0.02	<0.02	<0.02	<0.05	2.47	2.17	1.55	0.03	0.62
MW139	6/05/2021	1302_MW139_210506	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.72	0.66	0.44	0.01	0.22

Table T2
Current and Historical Groundwater Analytical Results
Department of Defence
PFAS OMP - RAAF Base Darwin

AECOM

				PFAS (Full Suite)																												
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTrDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																
PFAS NEMP (2020) FW 99% Species Protection																														0.00023	19	
Human Health Receptors																																
PFAS NEMP (2020) Human Health Drinking Water																													0.07		0.56	
Location Code	**Sample Date**	**Field ID**	**Sample Type**																													
MW139	10/11/2021	1302_MW139_211110	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.14	<0.02	<0.05	0.07	0.02	<0.02	<0.02	<0.05	2.63	2.26	1.70	0.03	0.56
MW139	9/03/2022	1302_MW139_220309	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.44	0.41	0.27	<0.01	0.14
MW139	29/09/2022	1302_MW139_220929	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.12	<0.02	<0.02	0.07	0.02	<0.05	<0.02	<0.02	2.29	1.94	1.45	0.04	0.49
MW139	22/03/2023	1302_MW139_230322	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	0.59	0.56	0.42	<0.01	0.14
MW141	24/07/2017	1302_MW141_170724	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.05	0.01	<0.02	<0.02	<0.02	<0.05	0.31	0.29	0.16	<0.01	0.13
MW141	28/08/2017	1302_MW141_170828	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	0.01	<0.02	<0.02	<0.02	<0.05	0.28	0.27	0.14	<0.01	0.13
MW141	7/03/2018	1302_MW141_180307	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.23	0.23	0.11	<0.01	0.12
MW141	13/12/2018	1302_MW141_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	<0.02	<0.02	<0.05	0.01	<0.02	<0.02	<0.02	<0.05	0.42	0.40	0.19	<0.01	0.21
MW141	20/03/2019	1302_MW141_190320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.27	0.27	0.15	<0.01	0.12
MW141	19/12/2019	1302_MW141_191217	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.25	0.25	0.11	<0.01	0.14
MW141	16/04/2020	1302_MW141_200414	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.21	0.21	0.08	<0.01	0.13
MW141	2/11/2020	1302_MW141_201102	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.45	0.45	0.26	<0.01	0.19
MW141	6/05/2021	1302_MW141_210506	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.30	0.30	0.11	<0.01	0.19
MW141	10/11/2021	1302_MW141_211110	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.32	0.32	0.16	<0.01	0.16
MW141	9/03/2022	1302_MW141_220309	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.29	0.29	0.13	<0.01	0.16
MW141	9/03/2022	1302_QC103_220309	Intralab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.33	0.33	0.15	<0.01	0.18
MW141	29/09/2022	1302_MW141_220929	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.32	0.32	0.17	<0.01	0.15
MW141	22/03/2023	1302_MW141_230322	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	0.45	0.45	0.25	<0.01	0.20
MW144	24/07/2017	1302_MW144_170724	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	<0.1	<0.02	<0.02	<0.02	0.11	0.03	0.29	<0.02	<0.05	0.20	0.06	<0.02	<0.02	<0.05	5.84	4.90	3.40	0.07	1.50
MW144	15/08/2017	1302_MW144A_170815	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	<0.1	<0.02	<0.02	<0.02	0.14	0.04	0.33	0.01	<0.05	0.26	0.06	<0.02	<0.02	<0.05	6.66	5.50	3.60	0.09	1.90
MW144	15/08/2017	1302_MW144B_170815	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	<0.1	<0.02	<0.02	<0.02	0.13	0.04	0.32	0.01	<0.05	0.26	0.06	<0.02	<0.02	<0.05	6.44	5.30	3.40	0.09	1.90
MW144	15/08/2017	1302_MW144C_170815	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	<0.1	<0.02	<0.02	<0.02	0.13	0.04	0.33	0.01	<0.05	0.26	0.06	<0.02	<0.02	<0.05	6.24	5.10	3.20	0.08	1.90
MW144	28/08/2017	1302_MW144_170828	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.20	<0.1	<0.02	<0.02	<0.02	0.11	0.03	0.29	<0.02	<0.05	0.22	0.05	<0.02	<0.02	<0.05	6.18	5.20	3.50	0.08	1.70
MW144	15/11/2017	1302_MW144_171115	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	<0.1	<0.02	<0.02	<0.02	0.10	0.03	0.30	<0.02	<0.05	0.22	0.05	<0.02	<0.02	<0.05	6.39	5.40	3.60	0.08	1.80
MW144	11/01/2018	1302_MW144_180111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.26	<0.02	<0.05	0.20	0.05	<0.02	<0.02	<0.05	5.77	4.90	3.40	0.07	1.50
MW144	7/03/2018	1302_MW144_180307	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.06	0.02	0.11	<0.02	<0.05	0.11	0.02	<0.02	<0.02	<0.05	3.02	2.55	1.60	0.03	0.95
MW144	13/12/2018	1302_MW144_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	<0.1	<0.02	<0.02	<0.02	0.09	0.05	0.38	<0.02	<0.05	0.31	0.08	<0.02	<0.02	<0.05	9.16	7.90	5.60	0.12	2.30
MW144	20/03/2019	1302_MW144_190320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.08	0.02	0.16	<0.02	<0.05	0.14	0.03	<0.02	<0.02	<0.05	3.51	2.80	1.70	0.05	1.10
MW144	16/12/2019	1302_MW144_191216	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.17	<0.1	<0.02	<0.02	<0.02	0.10	0.03	0.29	<0.02	<0.05	0.19	0.06	<0.02	<0.02	<0.05	5.70	4.80	3.24	0.06	1.56
MW144	16/04/2020	1302_MW144_200414	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	<0.1	<0.02	<0.02	<0.02	0.06	<0.02	0.19	<0.02	<0.05	0.10	0.03	<0.02	<0.02	<0.05	3.33	2.75	1.67	0.05	1.08
MW144	3/11/2020	1302_MW144_201103	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	<0.1	<0.02	<0.02	<0.02	0.13	0.04	0.36	<0.02	<0.05	0.25	0.07	<0.02	<0.02	<0.05	8.03	6.87	4.87	0.10	2.00
MW144	29/04/2021	1302_MW144_210429	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.08	0.02	0.19	<0.02	<0.05	0.15	0.05	<0.02	<0.02	<0.05	4.37	3.69	2.39	0.05	1.30
MW144	9/11/2021	1302_MW144_211110	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	<0.1	<0.02	<0.02	<0.02	0.12	0.04	0.39	<0.02	<0.05	0.21	0.06	<0.02	<0.02	<0.05	6.83	5.71	3.98	0.09	1.73
MW144	9/11/2021	1302_QC101_211110	Intralab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	<0.1	<0.02	<0.02	<0.02	0.12	0.04	0.39	<0.02	<0.05	0.25	0.05	<0.02	<0.02	<0.05	6.41	5.24	3.42	0.10	1.82
MW144	9/11/2021	1302_QC201_211110	Interlab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.17	<0.1	<0.02	<0.02	<0.02	0.07	0.03	0.25	<0.02	<0.05	0.16	0.06	<0.02	<0.02	<0.05	5.10	4.30	2.80	0.07	1.50
MW144	9/03/2022	1302_MW144_220309	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.06	<0.02	0.16	<0.02	<0.05	0.13	0.02	<0.02	<0.02	<0.05	2.69	2.15	1.16	0.03	0.99
MW144	28/09/2022	1302_MW144_220929	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.19	<0.1	<0.02	<0.02	<0.02	0.1	0.03	0.27	<0.02	<0.02	0.19	0.05	<0.05	<0.02	<0.02	5.46	4.55	3.12	0.08	1.43
MW148	7/08/2017	1302_MW148_170807	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	<0.1	<0.02	<0.02	<0.02	0.17	0.04	0.32	<0.02	<0.05	0.33	0.06	<0.02	<0.02	<0.05	8.48	7.20	4.50	0.14	2.70
MW148	24/08/2017	1302_MW148A_170824	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.20	<0.1	<0.02	<0.02	<0.02	0.18	0.07	0.34	<0.02	<0.05	0.21	0.08	<0.02	<0.02	<0.05	10.02	8.80	5.70	0.14	3.10
MW148	24/08/2017	1302_MW148B_170824	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.20	<0.1	<0.02	<0.02	<0.02	0.16	0.07	0.31	<0.02	<0.05	0.19	0.07	<0.02	<0.02	<0.05	8.43	7.30	4.30	0.13	3.00
MW148	24/08/2017	1302_MW148C_170824	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.20	<0.1	<0.02	<0.02	<0.02	0.16	0.07	0.33	<0.02	<0.05	0.21	0.07	<0.02	<0.02	<0.05	12.48	11.30	8.00	0.14	3.30
MW148	1/09/2017	1302_MW148 170901	Primary	<0.05	<0.05	0.06	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.19	<0.1	<0.02	<0.02	<0.02	0.22	0.06	0.33	<0.02	<0.05	0.30	0.07	<0.02	<0.02	<0.05	9.38	8.00	5.20	0.13	2.80
MW148	16/11/2017	1302_MW148_171116	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.17	<0.1	<0.02	<0.02	<0.02	0.23	0.06	0.26	<0.02	<0.05	0.24	0.05	<0.02	<0.02	<0.05	11.25	10.10	7.50	0.14	2.60
MW148	15/01/2018	1302_MW148_180115	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	<0.1	<0.02	<0.02	<0.02	0.17	0.05	0.31	<0.02	<0.05	0.31	0.06	<0.02	<0.02	<0.05	11.54	10.30	7.90	0.11	2.40
MW148	15/01/2018	1302_QCMW19_180115	Intralab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	<0.1	<0.02	<0.02	<0.02	0.15	0.05	0.30	<0.02	<0.05	0.31	0.06	<0.02	<0.02	<0.05	9.62	8.40	6.10	0.12	2.30
MW148	8/03/2018	1302_MW148 180308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	<0.1	<0.02	<0.02	<0.02	0.18	0.05	0.30	<0.02	<0.05	0.28	0.05	<0.02	<0.02	<0.05	11.40	10.20	7.60	0.12	2.60
MW148	9/05/2018	1302_MW148 8 180509	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	0.05	<0.02	<0.02	<0.02	0.28	0.07	0.35	0.01	<0.05	0.34	0.07	<0.02	<0.02	<0.05	10.86	9.30	6.10	0.15	3.20
MW148	9/05/2018	1302_MW148_4_180509	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	0.06	<0.02	<0.02	<0.02	0.20	0.06	0.41	<0.02	<0.05	0.28	0.08	<0.02	<0.02	<0.05	10.66	9.20	6.20	0.15	3.00
MW148	9/05/2018	1302_MW148_12_180509	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	<0.1	<0.02	<0.02	<0.02	0.25	0.07	0.33	<0.02	<0.05	0.34	0.07	<0.02	<0.02	<0.05	10.24	8.80	5.50	0.15	3.30
MW148	13/12/2018	1302_MW148_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.19	<0.1	<0.02	<0.02	<0.02	0.17	0.04	0.34	<0.02	<0.05	0.30	0.06	<0.02	<0.02	<0.05	12.22	11.00	7.80	0.12	3.20
MW148	20/03/2019	1302_MW148_190320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	<0.1	<0.02	<0.02	<0.02	0.18	0.05	0.28	<0.02	<0.05	0.22	0.06	<0.02	<0.02	<0.05	8.22	7.00	4.60	0.11	2.40
MW148	17/12/2019	1302_MW148_191217	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	<0.1	<0.02	<0.02	<0.02	0.18	0.05	0.30	<0.02	<0.05	0.20	0.06	<0.02	<0.02	<0.05	8.06	6.94	4.69	0.10	2.25
MW148	16/04/2020	1302_MW148_200414	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	<0.1	<0.02	<0.02	<0.02	0.17	0.05	0.33	<0.02	<0.05	0.18	0.05	<0.02	<0.02	<0.05	8.33	7.20	4.98	0.12	2.22
MW148	3/11/2020	1302_MW148_201103	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	<0.1	<0.02	<0.02	<0.02	0.23	0.06	0.34	<0.02	<0.05	0.34	0.06	<0.02	<0.02	<0.05	11.00	9.62	6.62	0.13	3.00
MW148	6/05/2021	1302_MW148_210506	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.22	0.06	0.42	<0.02	<0.05	0.32	0.07	<0.02	<0.02	<0.05	7.82	6.45	3.57	0.12	2.88
MW148	28/09/2022	1302_MW148_220928	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.2	0.04	0.23	<0.02	<0.02	0.25	0.04	<0.05	<0.02	<0.02	9.57	8.56	5.43	0.11	3.13
MW148	23/03/2023	1302_MW148_230323	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.18	0.04	0.23	<0.02	<0.02	0.21	0.06	<0.05	<0.02	<0.02	9.72	8.74	6.59	0.10	2.15
MW156	7/08/2017	1302_MW156_170807	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	0.06	<0.02	<0.02	<0.02	0.18	0.05	0.43	<0.02	<0.05	0.26	0.10	<0.02	<0.02	<0.05	9.44	8.00	5.70	0.12	2.30
MW156	23/08/2017	1302_MW156A_170823	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	0.06	<0.02	<0.02	<0.02	0.13	0.05	0.45	<0.02	<0.05	0.23	0.10	<0.02	<0.02	<0.05	9.27	7.90	5.60	0.12	2.30
MW156	23/08/2017	1302_MW156B_170823	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	0.06	<0.02	<0.02	<0.02	0.10	0.05	0.44	<0.02	<0.05	0.23	0.10	<0.02	<0.02	<0.05	7.40	6.10	4.00	0.10	2.10

Table T2
Current and Historical Groundwater Analytical Results
Department of Defence
PFAS OMP - RAAF Base Darwin

AECOM

				PFAS (Full Suite)																												
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTrDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																
PFAS NEMP (2020) FW 99% Species Protection																															0.00023	19	
Human Health Receptors																																
PFAS NEMP (2020) Human Health Drinking Water																														0.07		0.56	
Location Code	**Sample Date**	**Field ID**	**Sample Type**																														
MW156	23/08/2017	1302_MW156C_170823	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	0.06	<0.02	<0.02	<0.02	0.06	0.04	0.43	<0.02	<0.05	0.22	0.10	<0.02	<0.02	<0.05	4.91	3.70	1.90	0.07	1.80
MW156	5/09/2017	1302_MW156_170905	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.25	0.06	<0.02	<0.02	<0.02	0.11	0.06	0.45	<0.02	<0.05	0.22	0.11	<0.02	<0.02	<0.05	10.62	9.20	6.50	0.16	2.70
MW156	14/11/2017	1302_MW156_171114	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.19	0.07	<0.02	<0.02	<0.02	0.23	0.05	0.40	<0.02	<0.05	0.26	0.11	<0.02	<0.02	<0.05	12.97	11.50	8.70	0.16	2.80
MW156	11/01/2018	1302_MW156_180111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.20	0.05	<0.02	<0.02	<0.02	0.10	0.04	0.39	<0.02	<0.05	0.21	0.08	<0.02	<0.02	<0.05	8.67	7.50	5.70	0.10	1.80
MW156	30/01/2018	1302_MW156A_180130	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	0.06	<0.02	<0.02	<0.02	0.13	0.05	0.37	<0.02	<0.05	0.21	0.10	<0.02	<0.02	<0.05	8.59	7.40	5.00	0.11	2.40
MW156	30/01/2018	1302_MW156B_180130	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	0.06	<0.02	<0.02	<0.02	0.11	0.05	0.39	<0.02	<0.05	0.21	0.10	<0.02	<0.02	<0.05	7.81	6.60	4.40	0.11	2.20
MW156	31/01/2018	1302_MW156C_180131	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.17	0.06	<0.02	<0.02	<0.02	0.13	0.05	0.38	<0.02	<0.05	0.22	0.10	<0.02	<0.02	<0.05	8.72	7.50	5.10	0.11	2.40
MW156	7/03/2018	1302_MW156_180307	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.37	0.09	<0.02	<0.02	<0.02	0.20	0.08	0.71	<0.02	<0.05	0.41	0.14	<0.02	<0.02	<0.05	14.47	12.30	8.90	0.17	3.40
MW156	8/05/2018	1302_MW156_11_180508	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	0.06	<0.02	<0.02	<0.02	0.18	0.06	0.51	<0.02	<0.05	0.36	0.10	<0.02	<0.02	<0.05	9.03	7.40	4.90	0.14	2.50
MW156	8/05/2018	1302_MW156_7_180508	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.27	0.07	<0.02	<0.02	<0.02	0.22	0.07	0.63	<0.02	<0.05	0.46	0.11	<0.02	<0.02	<0.05	11.10	9.10	6.10	0.17	3.00
MW156	8/05/2018	1302_MW156_3_180508	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.31	0.09	<0.02	<0.02	<0.02	0.29	0.08	0.74	0.01	<0.05	0.53	0.14	<0.02	<0.02	<0.05	14.10	11.70	8.20	0.21	3.50
MW156	13/12/2018	1302 MW156 181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	0.06	<0.02	<0.02	<0.02	0.25	0.06	0.50	<0.02	<0.05	0.22	0.11	0.01	<0.02	<0.05	9.66	8.10	5.90	0.14	2.20
MW156	20/03/2019	1302 MW156 190320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.19	0.06	<0.02	<0.02	<0.02	0.14	0.04	0.35	<0.02	<0.05	0.21	0.07	<0.02	<0.02	<0.05	8.35	7.10	5.20	0.09	1.90
MW156	17/12/2019	1302 MW156 191217	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.07	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	1.34	1.17	0.82	0.01	0.35
MW156	16/04/2020	1302 MW156_200414	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.58	0.58	0.48	<0.01	0.10
MW156	3/11/2020	1302 MW156_201103	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.49	0.47	0.35	<0.01	0.12
MW156	29/04/2021	1302 MW156_210429	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.10	0.02	0.24	<0.02	<0.05	0.13	0.05	<0.02	<0.02	<0.05	5.49	4.78	3.46	0.06	1.32
MW156	10/11/2021	1302 MW156_211110	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	<0.1	<0.02	<0.02	<0.02	0.09	0.03	0.32	<0.02	<0.05	0.17	0.04	<0.02	<0.02	<0.05	5.66	4.79	3.35	0.07	1.44
MW156	10/03/2022	1302 MW156_220310	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.29	<0.1	<0.02	<0.02	<0.02	0.17	0.06	0.58	<0.02	<0.05	0.28	0.09	<0.02	<0.02	<0.05	8.86	7.26	5.09	0.13	2.17
MW156	28/09/2022	1302 MW156_220928	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.17	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.26	<0.02	<0.05	0.16	0.06	<0.05	<0.02	<0.02	5.56	4.76	3.33	0.04	1.43
MW156	14/03/2023	1302 MW156_230314	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.30	<0.1	<0.02	<0.02	<0.02	0.18	0.07	0.64	<0.02	<0.05	0.32	0.14	<0.05	<0.02	<0.02	10.50	8.72	5.98	0.16	2.74
MW176	5/09/2017	1302 MW176 170905	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.15	0.15	0.09	<0.01	0.06
MW176	5/09/2017	1302_MWQC39MW_170905	Interlab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.21	0.21	0.13	<0.01	0.08
MW176	7/03/2018	1302 MW176 180307	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.13	0.13	0.09	<0.01	0.04
MW176	21/03/2019	1302 MW176_190321	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.10	0.10	0.07	<0.01	0.03
MW176	4/11/2020	1302 MW176_201104	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.13	0.13	0.08	<0.01	0.05
MW176	28/04/2021	1302 MW176_210428	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.08	0.08	0.05	<0.01	0.03
MW176	11/11/2021	1302 MW176_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.13	0.13	0.09	<0.01	0.04
MW176	11/11/2021	1302_QC103_211111	Intralab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.11	0.11	0.07	<0.01	0.04
MW176	11/11/2021	1302_QC203_211111	Interlab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.09	0.09	0.06	<0.01	0.03
MW176	8/03/2022	1302_MW176_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.13	0.13	0.08	<0.01	0.05
MW176	29/09/2022	1302_MW176_220929	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.05	<0.02	<0.02	0.04	<0.05	<0.02	0.23	0.13	0.09	0.01	0.04
MW176	20/03/2023	1302_MW176_230320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.05	<0.02	0.12	0.12	0.08	<0.01	0.04
MW176	20/03/2023	1302_QC101_230320	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.05	<0.02	0.17	0.17	0.12	<0.01	0.05
MW176	20/03/2023	1302_QC201_230320	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	0.09	0.09	0.06	<0.01	0.04
MW180	6/09/2017	1302 MW180 170906	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.09	0.03	<0.01	0.06
MW180	7/03/2018	1302 MW180 180307	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.13	0.12	0.01	<0.01	0.11
MW180	13/12/2018	1302 MW180 181213	Primary	<0.05	<0.05	0.16	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.33	0.17	0.09	<0.01	0.08
MW180	13/12/2018	1302_QCMW1 181213	Intralab Dup	<0.05	<0.05	0.27	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	0.01	<0.02	<0.02	<0.02	<0.05	0.79	0.47	0.35	0.01	0.12
MW180	21/03/2019	1302_MW180_190321	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.05	<0.01	<0.01	0.05
MW180	16/12/2019	1302 MW180_191216	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.05	0.05	<0.01	<0.01	0.05
MW180	16/04/2020	1302 MW180_200415	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.05	0.05	<0.01	<0.01	0.05
MW180	2/11/2020	1302 MW180_201102	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.05	0.05	<0.01	<0.01	0.05
MW180	28/04/2021	1302 MW180_210428	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.07	0.07	<0.01	<0.01	0.07
MW180	10/11/2021	1302 MW180_211110	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.08	0.08	0.01	<0.01	0.07
MW180	8/03/2022	1302_MW180_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.08	0.08	<0.01	<0.01	0.08
MW180	29/09/2022	1302_MW180_220929	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.05	<0.02	0.31	0.27	0.15	<0.01	0.12
MW180	20/03/2023	1302_MW180_230320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.05	<0.02	0.09	0.09	0.01	<0.01	0.08
MW180	20/03/2023	1302_QC100_230320	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.05	<0.02	0.11	0.11	0.02	<0.01	0.09
MW180	20/03/2023	1302_QC200_230320	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	0.07	0.07	<0.01	<0.01	0.07
MW185	5/09/2017	1302_MW185_170905	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.03	<0.01	<0.01	0.03
MW185	16/11/2017	1302_MW185_171116	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.02	<0.01	<0.01	0.02
MW185	15/01/2018	1302_MW185_180115	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
MW185	22/03/2018	1302_MW185_180322	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
MW185	13/12/2018	1302_MW185_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.93	0.70	0.23	0.02	0.47
MW185	18/02/2019	1302_MW185_190218	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.23	0.17	0.03	<0.01	0.14
MW185	21/03/2019	1302_MW185_190321	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.05	0.01	<0.01	0.04
MW185	16/12/2019	1302_MW185_191216	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.05	0.04	0.02	<0.02	<0.02	<0.05	0.53	0.36	0.10	0.01	0.26

Table T2
Current and Historical Groundwater Analytical Results
Department of Defence
PFAS OMP - RAAF Base Darwin

AECOM

				PFAS (Full Suite)																												
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	PFOSA	PFPeS	PFPeA	PFTrDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																
PFAS NEMP (2020) FW 99% Species Protection																														0.00023	19	
Human Health Receptors																																
PFAS NEMP (2020) Human Health Drinking Water																													0.07		0.56	
Location Code	**Sample Date**	**Field ID**	**Sample Type**																													
MW185	2/11/2020	1302_MW185_201102	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.05	0.05	<0.02	<0.02	<0.02	<0.05	0.76	0.60	0.26	0.02	0.34
MW185	28/04/2021	1302_MW185_210428	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.15	0.15	0.06	<0.01	0.09
MW185	11/11/2021	1302_MW185_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.23	0.20	0.10	0.01	0.10
MW185	8/03/2022	1302_MW185_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.02	0.02	<0.01	<0.01	0.02
MW185	28/09/2022	1302_MW185_220928	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.05	0.5	0.38	0.12	0.02	0.26
MW185	20/03/2023	1302_MW185_230320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.05	0.05	0.04	<0.01	0.01
MW189	5/09/2017	1302_MW189_170905	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.10	0.08	0.03	<0.01	0.05
MW189	8/03/2018	1302_MW189_180309	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.05	0.03	<0.01	0.02
MW189	17/04/2020	1302_MW189_200417	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.10	0.10	0.06	<0.01	0.04
MW190	30/08/2017	1302_MW190A_170830	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.07	0.02	0.21	<0.02	<0.05	0.15	0.06	<0.02	<0.02	<0.05	4.09	3.40	2.20	0.05	1.20
MW190	30/08/2017	1302_MW190B_170830	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.09	0.02	0.21	<0.02	<0.05	0.17	0.05	<0.02	<0.02	<0.05	4.94	4.20	2.90	0.06	1.30
MW190	30/08/2017	1302_MW190C_170830	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	<0.1	<0.02	<0.02	<0.02	0.05	0.02	0.17	<0.02	<0.05	0.13	0.04	<0.02	<0.02	<0.05	2.93	2.36	1.40	0.04	0.96
MW190	5/09/2017	1302_MW190_170905	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.05	0.03	0.20	<0.02	<0.05	0.14	0.04	<0.02	<0.02	<0.05	4.16	3.50	2.10	0.06	1.40
MW190	5/09/2017	1302_MW190_170905	Primary	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MW190	16/11/2017	1302_MW190_171116	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.16	<0.02	<0.05	0.12	0.04	<0.02	<0.02	<0.05	4.68	4.10	2.80	0.06	1.30
MW190	11/01/2018	1302_MW190_180111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.06	0.02	0.18	<0.02	<0.05	0.14	0.04	<0.02	<0.02	<0.05	3.90	3.30	2.20	0.05	1.10
MW190	8/03/2018	1302_MW190_180309	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.03	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	1.09	0.99	0.74	0.01	0.25
MW190	9/05/2018	1302_MW190_11_180509	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	0.01	0.02	<0.02	<0.05	0.01	0.01	<0.02	<0.02	<0.05	0.51	0.45	0.31	0.01	0.14
MW190	9/05/2018	1302_MW190_3_180509	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.12	<0.02	<0.05	0.14	0.03	<0.02	<0.02	<0.05	3.23	2.70	1.30	0.04	1.40
MW190	9/05/2018	1302_MW190_7_180509	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.12	0.12	0.07	<0.01	0.05
MW190	11/11/2021	1302_MW190_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.08	0.05	0.46	<0.02	<0.05	0.14	0.09	<0.02	<0.02	<0.05	4.94	3.90	2.54	0.08	1.36
MW190	8/03/2022	1302_MW190_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.03	0.03	0.02	<0.01	0.01
MW190	28/09/2022	1302_MW190_220928	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.1	0.03	0.29	<0.02	<0.02	0.19	0.05	<0.05	<0.02	<0.02	5.26	4.39	2.78	0.08	1.61
MW190	20/03/2023	1302_MW190_230320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	0.52	0.49	0.36	0.01	0.13
MW191	5/09/2017	1302_MW191_170905	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.03	0.02	0.14	<0.02	<0.05	0.08	0.03	<0.02	<0.02	<0.05	3.22	2.80	1.80	0.04	1.00
MW191	11/10/2017	1302_QC3MW_170905	Interlab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.18	<0.02	<0.05	0.14	0.02	<0.02	<0.02	<0.05	3.93	3.30	2.09	0.05	1.21
MW191	16/11/2017	1302_MW191_171116	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.16	<0.02	<0.05	0.10	0.04	<0.02	<0.02	<0.05	4.42	3.90	2.90	0.06	1.00
MW191	15/01/2018	1302_MW191_180115	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.04	0.02	0.16	<0.02	<0.05	0.10	0.04	<0.02	<0.02	<0.05	3.51	3.02	2.20	0.05	0.82
MW191	8/03/2018	1302_MW191_180309	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.03	0.02	0.11	<0.02	<0.05	0.08	0.02	<0.02	<0.02	<0.05	2.78	2.43	1.80	0.03	0.63
MW191	9/05/2018	1302_MW191_4_180509	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.04	0.03	0.16	0.01	<0.05	0.11	0.04	<0.02	<0.02	<0.05	3.91	3.40	2.00	0.05	1.40
MW191	9/05/2018	1302_MW191_7_180509	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.04	0.03	0.15	0.01	<0.05	0.11	0.04	<0.02	<0.02	<0.05	3.70	3.20	1.90	0.05	1.30
MW191	9/05/2018	1302_MW191_11_180509	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.04	0.03	0.14	0.01	<0.05	0.11	0.04	<0.02	<0.02	<0.05	3.69	3.20	1.90	0.05	1.30
MW191	13/12/2018	1302_MW191_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.05	0.02	0.18	<0.02	<0.05	0.09	0.04	<0.02	<0.02	<0.05	4.41	3.90	2.90	0.05	1.00
MW191	13/12/2018	1302_QCMW5_181213	Intralab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.05	0.02	0.15	<0.02	<0.05	0.10	0.03	<0.02	<0.02	<0.05	4.27	3.80	2.70	0.05	1.10
MW191	21/03/2019	1302_MW191_190321	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.03	0.02	0.15	<0.02	<0.05	0.07	0.03	<0.02	<0.02	<0.05	3.02	2.61	1.70	0.04	0.91
MW191	18/12/2019	1302_MW191_191218	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.14	<0.02	<0.05	0.08	0.03	<0.02	<0.02	<0.05	2.86	2.46	1.70	0.03	0.76
MW191	16/04/2020	1302_MW191_200415	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.13	<0.02	<0.05	0.06	0.02	<0.02	<0.02	<0.05	2.24	1.91	1.17	0.03	0.74
MW191	3/11/2020	1302_MW209_201103	Priamry	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.13	<0.02	<0.05	0.08	0.03	<0.02	<0.02	<0.05	2.70	2.34	1.59	0.03	0.75
MW191	28/04/2021	1302_MW191_210428	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.13	<0.02	<0.05	0.07	0.02	<0.02	<0.02	<0.05	2.25	1.92	1.13	0.03	0.79
MW191	11/11/2021	1302_MW191_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.17	<0.02	<0.05	0.05	0.04	<0.02	<0.02	<0.05	2.39	2.01	1.37	0.04	0.64
MW191	8/03/2022	1302_MW191_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.17	<0.02	<0.05	0.09	0.03	<0.02	<0.02	<0.05	2.50	2.07	1.26	0.03	0.81
MW191	28/09/2022	1302_MW191_220928	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.05	<0.02	0.17	<0.02	<0.02	0.11	0.03	<0.05	<0.02	<0.02	3.67	3.18	2.14	0.05	1.04
MW191	20/03/2023	1302_MW191_230320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.12	<0.02	<0.02	0.07	0.04	<0.05	<0.02	<0.02	3.02	2.65	1.87	0.04	0.78
MW193	5/09/2017	1302_MW193_170905	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.23	<0.02	<0.05	0.15	0.05	<0.02	<0.02	<0.05	4.84	4.10	2.50	0.07	1.60
MW193	11/10/2017	1302_QC2MW_170905	Interlab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.32	<0.1	<0.02	<0.02	<0.02	0.12	0.04	0.29	<0.02	<0.05	0.22	0.05	<0.02	<0.02	<0.05	5.97	4.86	3.03	0.07	1.83
MW193	16/11/2017	1302_MW193_171116	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.05	0.02	0.22	<0.02	<0.05	0.15	0.04	<0.02	<0.02	<0.05	4.99	4.30	2.90	0.06	1.40
MW193	15/01/2018	1302_MW193_180115	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.07	0.02	0.20	<0.02	<0.05	0.18	0.05	<0.02	<0.02	<0.05	4.51	3.80	2.60	0.06	1.20
MW193	5/02/2018	1302_MW193A_180205	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	0.01	0.07	<0.02	<0.05	0.04	0.02	<0.02	<0.02	<0.05	1.36	1.15	0.80	0.02	0.35
MW193	5/02/2018	1302_MW193B_180205	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	0.01	0.07	<0.02	<0.05	0.04	0.02	<0.02	<0.02	<0.05	1.27	1.06	0.72	0.02	0.34
MW193	5/02/2018	1302_MW193C_180205	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.06	<0.02	<0.05	0.03	0.02	<0.02	<0.02	<0.05	1.15	0.97	0.67	0.02	0.30
MW193	8/03/2018	1302_MW193_180309	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.04	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	1.06	0.94	0.71	0.01	0.23
MW193	13/12/2018	1302_MW193_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	<0.1	<0.02	<0.02	<0.02	0.10	0.04	0.33	<0.02	<0.05	0.16	0.07	<0.02	<0.02	<0.05	5.90	5.00	3.40	0.08	1.60
MW193	21/03/2019	1302_MW193_190321	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.07	0.02	0.22	<0.02	<0.05	0.15	0.05	<0.02	<0.02	<0.05	3.85	3.10	1.70	0.06	1.40
MW193	18/12/2019	1302_MW193_191218	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	<0.1	<0.02	<0.02	<0.02	0.07	0.03	0.24	<0.02	<0.05	0.12	0.06	<0.02	<0.02	<0.05	3.83	3.13	1.89	0.06	1.24
MW193	16/04/2020	1302_MW193_200415	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	1.47	1.37	1.10	0.01	0.27
MW193	2/11/2020	1302_MW193_201102	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.05	0.04	<0.02	<0.02	<0.02	<0.05	1.08	0.95	0.62	0.01	0.33
MW193	6/05/2021	1302_MW193_210506	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.13	0.13	0.10	<0.01	0.03
MW194	6/09/2017	1302_MW194_170906	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.08	0.04	0.24	<0.02	<0.05	0.13	0.05	<0.02	<0.02	<0.05	5.60	4.90	3.80	0.08	1.10
MW194	16/11/2017	1302_MW194_171116	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.07	0.03	0.25	<0.02	<0.05	0.11	0.05	<0.02	<0.02	<0.05	6.70	6.00	4.90	0.08	1.10
MW194	5/02/2018	1302_MW194A_180205	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.20	<0.02	<0.05	0.10	0.04	<0.02	<0.02	<0.05	4.47	3.89	2.90	0.06	0.99
MW194	5/02/2018	1302_MW194B_180205	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.20	<0.02	<0.05	0.10	0.05	<0.02	<0.02	<0.05	3.99	3.40	2.50	0.06	0.90

Table T2
Current and Historical Groundwater Analytical Results
Department of Defence
PFAS OMP - RAAF Base Darwin

AECOM

				PFAS (Full Suite)																												
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	PFOSA	PFPeS	PFPeA	PFTrDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																
PFAS NEMP (2020) FW 99% Species Protection																														0.00023	19	
Human Health Receptors																																
PFAS NEMP (2020) Human Health Drinking Water																													0.07		0.56	
Location Code	**Sample Date**	**Field ID**	**Sample Type**																													
MW194	5/02/2018	1302_MW194C_180205	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.19	<0.02	<0.05	0.10	0.04	<0.02	<0.02	<0.05	3.90	3.34	2.40	0.06	0.94
MW194	8/03/2018	1302_MW194_180309	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.06	0.02	0.19	<0.02	<0.05	0.10	0.03	<0.02	<0.02	<0.05	4.44	3.91	3.10	0.05	0.81
MW194	13/12/2018	1302_MW194_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.26	<0.02	<0.05	0.19	0.05	<0.02	<0.02	<0.05	5.62	4.80	3.30	0.08	1.50
MW194	21/03/2019	1302_MW194_190321	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.07	0.03	0.29	<0.02	<0.05	0.13	0.07	<0.02	<0.02	<0.05	4.14	3.30	2.10	0.07	1.20
MW194	18/12/2019	1302_MW194_191218	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.10	<0.1	<0.02	<0.02	<0.02	0.06	0.02	0.18	<0.02	<0.05	0.10	0.04	<0.02	<0.02	<0.05	3.50	2.96	2.09	0.04	0.87
MW194	16/04/2020	1302_MW194_200415	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	<0.1	<0.02	<0.02	<0.02	0.06	0.02	0.23	<0.02	<0.05	0.08	0.03	<0.02	<0.02	<0.05	3.90	3.30	2.43	0.06	0.87
MW194	2/11/2020	1302_MW194_201102	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.20	<0.02	<0.05	0.13	<0.02	<0.02	<0.02	<0.05	3.78	3.19	2.22	0.06	0.97
MW194	6/05/2021	1302_MW194_210506	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.06	<0.02	0.18	<0.02	<0.05	0.08	0.03	<0.02	<0.02	<0.05	3.05	2.60	1.83	0.04	0.77
MW194	11/11/2021	1302_MW194_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	<0.1	<0.02	<0.02	<0.02	0.08	0.04	0.33	<0.02	<0.05	0.14	0.07	<0.02	<0.02	<0.05	5.57	4.65	3.51	0.08	1.14
MW194	8/03/2022	1302_MW194_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.08	0.02	0.36	<0.02	<0.05	0.14	0.06	<0.02	<0.02	<0.05	4.49	3.64	2.41	0.06	1.23
MW194	28/09/2022	1302_MW194_220928	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.27	<0.02	<0.05	0.14	0.04	<0.02	<0.02	<0.05	4.6	3.84	2.7	0.08	1.14
MW194	20/03/2023	1302_MW194_230320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.22	<0.02	<0.05	0.10	0.06	<0.05	<0.02	<0.02	5.40	4.75	3.66	0.07	1.09
MW195	6/09/2017	1302_MW195_170906	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.06	<0.02	<0.05	0.06	0.01	<0.02	<0.02	<0.05	1.44	1.23	0.76	0.02	0.47
MW195	16/11/2017	1302_MW195_171116	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.02	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.90	0.81	0.53	<0.01	0.28
MW195	15/01/2018	1302_MW195_180115	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.10	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.07	<0.02	<0.05	0.11	0.02	<0.02	<0.02	<0.05	2.21	1.86	1.10	0.02	0.76
MW195	8/03/2018	1302_MW195_180309	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.04	<0.02	<0.05	0.04	<0.02	<0.02	<0.02	<0.05	1.32	1.18	0.86	0.01	0.32
MW195	13/12/2018	1302_MW195_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.07	<0.02	<0.05	0.11	0.01	<0.02	<0.02	<0.05	2.29	1.97	1.10	0.02	0.87
MW195	21/03/2019	1302_MW195_190321	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.03	0.01	0.11	<0.02	<0.05	0.06	0.04	<0.02	<0.02	<0.05	1.68	1.32	0.78	0.03	0.54
MW195	18/12/2019	1302_MW195_191218	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.11	0.11	0.07	<0.01	0.04
MW195	16/04/2020	1302_MW195_200415	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	0.08	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	4.16	4.02	3.49	0.02	0.53
MW195	2/11/2020	1302_MW195_201102	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.30	0.30	0.24	<0.01	0.06
MW195	6/05/2021	1302_MW195_210506	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.09	0.09	0.06	<0.01	0.03
MW195	11/11/2021	1302_MW195_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.07	<0.02	<0.05	0.08	<0.02	<0.02	<0.02	<0.05	2.07	1.77	1.04	0.02	0.73
MW195	8/03/2022	1302_MW195_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.20	0.20	0.12	<0.01	0.08
MW195	28/09/2022	1302_MW195_220928	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.05	0.06	<0.02	<0.05	<0.02	<0.02	1.63	1.44	0.92	0.01	0.52
MW195	20/03/2023	1302_MW195_230320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.05	0.04	<0.02	<0.05	<0.02	<0.02	1.41	1.27	0.92	0.02	0.35
MW197	7/09/2017	1302_MW197_170907	Primary	0.02	0.03	<0.05	0.03	0.15	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	0.08	0.03	0.03	0.03	0.18	0.08	0.48	0.03	<0.05	0.29	0.13	0.03	0.03	0.03	8.36	6.30	4.10	0.14	2.20
MW197	11/01/2018	1302_MW197_180111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	<0.1	<0.02	<0.02	<0.02	0.19	0.05	0.39	<0.02	<0.05	0.23	0.08	<0.02	<0.02	<0.05	11.23	10.00	7.80	0.11	2.20
MW197	8/03/2018	1302_MW197_180308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	0.05	<0.02	<0.02	<0.02	0.23	0.06	0.53	<0.02	<0.05	0.28	0.12	<0.02	<0.02	<0.05	12.40	10.80	7.80	0.15	3.00
MW197	14/12/2018	1302_MW197_181214	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.19	0.05	0.02	<0.02	<0.02	0.36	0.06	0.51	<0.02	<0.05	0.23	0.11	<0.02	<0.02	<0.05	14.07	12.40	9.20	0.14	3.20
MW197	20/03/2019	1302_MW197_190320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	0.06	<0.02	<0.02	<0.02	0.22	0.05	0.48	<0.02	<0.05	0.25	0.10	<0.02	<0.02	<0.05	11.06	9.40	6.70	0.12	2.70
MW197	16/04/2020	1302_MW197_200414	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.34	<0.1	<0.02	<0.02	<0.02	0.24	0.08	0.86	<0.02	<0.05	0.33	0.16	<0.02	<0.02	<0.05	12.10	9.91	6.16	0.18	3.75
MW197	3/11/2020	1302_MW197_201103	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	<0.1	0.02	<0.02	<0.02	0.47	0.10	0.81	<0.02	<0.05	0.40	0.17	<0.02	<0.02	<0.05	25.70	23.20	18.30	0.30	4.93
MW197	29/04/2021	1302_MW197_210429	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	<0.1	<0.02	<0.02	<0.02	0.20	0.07	0.64	<0.02	<0.05	0.30	0.12	<0.02	<0.02	<0.05	10.60	8.84	5.66	0.15	3.18
MW197	9/11/2021	1302_MW197_211109	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	<0.1	<0.02	<0.02	<0.02	0.29	0.06	0.56	<0.02	<0.05	0.28	0.08	<0.02	<0.02	<0.05	11.20	9.61	6.68	0.16	2.93
MW197	9/03/2022	1302_MW197_220309	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.20	<0.1	<0.02	<0.02	<0.02	0.15	0.04	0.68	<0.02	<0.05	0.27	0.11	<0.02	<0.02	<0.05	9.05	7.48	4.90	0.12	2.58
MW197	23/03/2023	1302_MW197_230323	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.12	0.06	0.47	<0.02	<0.05	0.21	0.08	<0.05	<0.02	<0.02	8.40	7.20	4.89	0.12	2.31
MW200	5/09/2017	1302_MW200_170905	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.03	0.01	0.10	<0.02	<0.05	0.08	0.02	<0.02	<0.02	<0.05	2.08	1.72	0.92	0.03	0.80
MW200	17/11/2017	1302_MW200_171117	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.04	0.01	0.11	<0.02	<0.05	0.09	0.02	<0.02	<0.02	<0.05	2.73	2.34	1.50	0.03	0.84
MW200	15/01/2018	1302_MW200_180115	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.04	0.01	0.10	<0.02	<0.05	0.10	0.02	<0.02	<0.02	<0.05	2.44	2.05	1.30	0.03	0.75
MW200	7/03/2018	1302_MW200_180307	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.68	0.62	0.40	<0.01	0.22
MW200	13/12/2018	1302_MW200_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	<0.1	<0.02	<0.02	<0.02	0.09	0.03	0.16	<0.02	<0.05	0.13	0.03	<0.02	<0.02	<0.05	4.72	4.10	3.00	0.06	1.10
MW200	21/03/2019	1302_MW200_190321	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.03	0.01	0.09	<0.02	<0.05	0.07	0.02	<0.02	<0.02	<0.05	1.79	1.46	0.83	0.02	0.63
MW200	16/12/2019	1302_MW200_191216	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.08	<0.02	<0.05	0.07	<0.02	<0.02	<0.02	<0.05	1.83	1.55	0.92	0.02	0.63
MW200	16/04/2020	1302_MW200_200415	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.09	<0.02	<0.05	0.05	<0.02	<0.02	<0.02	<0.05	2.07	1.81	1.23	0.02	0.58
MW200	2/11/2020	1302_MW200_201102	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.08	<0.02	<0.05	0.06	<0.02	<0.02	<0.02	<0.05	1.84	1.57	0.97	0.02	0.60
MW200	28/04/2021	1302_MW200_210428	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.07	<0.02	<0.05	0.06	<0.02	<0.02	<0.02	<0.05	1.69	1.46	0.89	0.02	0.57
MW200	11/11/2021	1302_MW200_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.13	<0.02	<0.05	0.08	0.02	<0.02	<0.02	<0.05	2.17	1.78	1.04	0.03	0.74
MW200	8/03/2022	1302_MW200_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.71	0.61	0.36	<0.01	0.25
MW200	29/09/2022	1302_MW200_220929	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.05	<0.02	0.18	<0.02	<0.05	0.08	0.03	<0.05	<0.02	<0.02	2.95	2.49	1.35	0.04	1.14
MW200	20/03/2023	1302_MW200_230320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.03	<0.02	<0.05	<0.02	<0.02	0.84	0.76	0.46	<0.01	0.30
MW201	11/11/2021	1302_MW201_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.08	0.08	0.07	<0.01	0.01
MW201	8/03/2022	1302_MW201_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.02	0.02	0.01	<0.01	0.01
MW205	13/11/2017	1302_MW205_171113	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.05	0.06	<0.02	<0.02	<0.02	<0.05	1.30	1.12	0.61	0.01	0.51
MW205	12/01/2018	1302_MW205_180112	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.25	<0.1	<0.02	<0.02	<0.02	0.12	0.05	0.33	<0.02	<0.05	0.35	0.08	<0.02	<0.02	<0.05	7.38	6.10	3.70	0.10	2.40
MW205	6/03/2018	1302_MW205_180306	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	<0.1	<0.02	<0.02	<0.02	0.12	0.04	0.27	<0.02	<0.05	0.21	0.06	<0.02	<0.02	<0.05	5.87	4.90	3.70	0.09	1.20
MW205	15/12/2018	1302_MW205_181215	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.25	<0.1	<0.02	<0.02	<0.02	0.26	0.06	0.45	<0.02	<0.05	0.29	0.10	<0.02	<0.02	<0.05	10.55	9.00	6.20	0.14	2.80
MW205	20/03/2019	1302_MW205_190320	Primary	<0.05	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.26	<0.1	<0.02	<0.02	<0.02	0.14	0.05	0.34	<0.02	<0.05	0.28	0.08	<0.02	<0.02	<0.05	6.40	5.00	3.30	0.09	1.70
MW205	17/12/2019	1302_MW205_191217	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.05	0.04	<0.02	<0.02	<0.02	<0.05	1.13	0.99	0.62	<0.01	0.37
MW205	16/04/2020	1302_MW205_200414	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.72	0.65	0.39	<0.01	0.26
MW205	3/11/2020	1302_MW205_201103	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.05	0.06	<0.02	<0.02	<0.02	<0.05	1.88	1.67	1.07	0.02	0.60

Table T2
Current and Historical Groundwater Analytical Results
Department of Defence
PFAS OMP - RAAF Base Darwin

AECOM

				PFAS (Full Suite)																												
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTrDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																
PFAS NEMP (2020) FW 99% Species Protection																														0.00023	19	
Human Health Receptors																																
PFAS NEMP (2020) Human Health Drinking Water																													0.07		0.56	
Location Code	**Sample Date**	**Field ID**	**Sample Type**																													
MW205	29/04/2021	1302_MW205_210429	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.05	0.04	<0.02	<0.02	<0.02	<0.05	1.04	0.91	0.51	<0.01	0.40
MW205	10/11/2021	1302_MW205_211110	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.26	<0.1	<0.02	<0.02	<0.02	0.15	0.05	0.42	<0.02	<0.05	0.31	0.06	<0.02	<0.02	<0.05	8.25	6.88	4.64	0.12	2.24
MW205	10/03/2022	1302_MW205_220310	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.26	<0.1	<0.02	<0.02	<0.02	0.10	0.05	0.40	<0.02	<0.05	0.23	0.07	<0.02	<0.02	<0.05	5.21	4.01	2.45	0.09	1.56
MW205	28/09/2022	1302_MW205_220928	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.02	0.06	<0.02	<0.05	<0.02	<0.02	1.64	1.45	0.91	0.01	0.54
MW205	14/03/2023	1302_MW205_230314	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.07	0.03	0.24	<0.02	<0.02	0.16	0.05	<0.05	<0.02	<0.02	3.82	3.04	1.84	0.07	1.20
MW209	28/09/2022	1302_MW209_220928	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
MW209	20/03/2023	1302_MW209_230320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
MW209*	16/11/2017	1302_MW211_171116	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
MW209*	15/01/2018	1302_MW211_180115	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
MW209*	8/03/2018	1302_MW211_180308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.01	0.01	<0.01	<0.01
MW209*	13/12/2018	1302_MW211_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.05	0.05	<0.01	<0.01
MW209*	21/03/2019	1302_MW211_190321	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
MW209*	16/12/2019	1302_MW211_191216	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
MW209*	16/04/2020	1302_MW211_200414	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
MW209*	3/11/2020	1302_MW191_201103	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
MW209*	28/04/2021	1302_MW209_210428	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.03	0.02	0.02	0.01	<0.01
MW209*	10/11/2021	1302_MW209_211110	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
MW209*	8/03/2022	1302_MW209_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
MW210	16/11/2017	1302_MW210_171116	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	0.28	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.12	<0.02	<0.05	0.08	0.03	<0.02	<0.02	<0.05	5.05	4.31	3.40	0.06	0.91
MW210	15/01/2018	1302_MW210_180115	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.04	0.02	0.08	<0.02	<0.05	0.10	0.03	<0.02	<0.02	<0.05	2.95	2.58	1.80	0.03	0.78
MW210	8/03/2018	1302_MW210_180308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.05	0.04	0.02	<0.02	<0.02	<0.05	1.70	1.52	1.10	0.02	0.42
MW210	13/12/2018	1302_MW210_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.04	<0.02	<0.05	0.01	0.02	<0.02	<0.02	<0.05	3.05	2.93	2.70	0.02	0.23
MW210	21/03/2019	1302_MW210_190321	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.03	0.01	0.07	<0.02	<0.05	0.06	0.02	<0.02	<0.02	<0.05	2.21	1.93	1.30	0.03	0.63
MW210	16/12/2019	1302_MW210_191216	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.06	0.02	0.11	<0.02	<0.05	0.09	0.03	<0.02	<0.02	<0.05	3.29	2.83	2.08	0.04	0.75
MW210	16/04/2020	1302_MW210_200415	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.15	<0.02	<0.05	0.08	0.03	<0.02	<0.02	<0.05	3.96	3.40	2.48	0.05	0.92
MW210	2/11/2020	1302_MW211_201102	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.09	0.03	0.15	<0.02	<0.05	0.10	0.02	<0.02	<0.02	<0.05	4.60	3.99	2.91	0.05	1.08
MW210	28/04/2021	1302_MW210_210428	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	<0.1	<0.02	<0.02	<0.02	0.11	0.03	0.16	<0.02	<0.05	0.12	0.04	<0.02	<0.02	<0.05	5.01	4.28	2.73	0.06	1.55
MW210	11/11/2021	1302_MW210_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.05	0.03	0.02	<0.02	<0.02	<0.05	1.68	1.49	1.10	0.02	0.39
MW210	8/03/2022	1302_MW210_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.05	0.05	<0.02	<0.02	<0.02	<0.05	1.53	1.32	0.82	0.02	0.50
MW210	28/09/2022	1302_MW210_220928	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	<0.1	<0.02	<0.02	<0.02	0.06	0.02	0.12	<0.02	<0.02	0.08	0.03	<0.05	<0.02	<0.02	3.35	2.87	2.13	0.05	0.74
MW210	20/03/2023	1302_MW210_230320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	2.10	1.91	1.47	0.02	0.44
MW211	29/09/2022	1302_MW211_220929	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.03	0.03	0.02	<0.01	0.01
MW211	20/03/2023	1302_MW211_230320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.04	0.04	0.03	<0.01	0.01
MW211*	17/11/2017	1302_MW209_171117	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	0.01	<0.02	<0.02	<0.02	<0.05	0.38	0.36	0.22	<0.01	0.14
MW211*	15/01/2018	1302_MW209_180115	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	0.01	<0.02	<0.02	<0.02	<0.05	0.28	0.26	0.16	<0.01	0.10
MW211*	7/03/2018	1302_MW209_180307	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.24	0.24	0.15	<0.01	0.09
MW211*	13/12/2018	1302_MW209_181213	Primary	<0.05	<0.05	0.23	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.86	0.58	0.41	<0.01	0.17
MW211*	21/03/2019	1302_MW209_190321	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.30	0.28	0.18	<0.01	0.10
MW211*	16/12/2019	1302_MW209_191216	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.33	0.33	0.19	<0.01	0.14
MW211*	16/04/2020	1302_MW209_200415	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.31	0.31	0.18	<0.01	0.13
MW211*	3/11/2020	1302_MW211_201103	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.43	0.43	0.27	<0.01	0.16
MW211*	28/04/2021	1302_MW211_210428	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.07	0.07	0.04	<0.01	0.03
MW211*	11/11/2021	1302_MW211_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.36	0.36	0.22	<0.01	0.14
MW211*	8/03/2022	1302_MW211_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.10	0.10	0.06	<0.01	0.04
MW215	22/04/2017	1302_201_MW04_170422	Primary	<0.05	<0.05	0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.54	0.10	<0.02	<0.02	<0.02	0.26	0.16	0.85	<0.02	<0.05	0.60	0.19	<0.02	<0.02	<0.05	15.86	12.90	7.40	0.21	5.50
MW215	24/04/2017	1302_201_MW04_170424	Primary	<0.05	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.47	0.09	<0.02	<0.02	<0.02	0.24	0.14	0.78	<0.02	<0.05	0.57	0.18	<0.02	<0.02	<0.05	13.30	10.60	6.10	0.19	4.50
MW215	8/08/2017	1302_201_MW04-1_170808	Primary	<0.05	<0.05	0.09	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	0.05	<0.02	<0.02	<0.02	0.09	0.06	0.28	<0.02	<0.05	0.20	0.12	<0.02	<0.02	<0.05	5.60	4.50	2.80	0.08	1.70
MW215	8/08/2017	1302_201_MW04-3_170808	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	0.06	<0.02	<0.02	<0.02	0.11	0.06	0.29	<0.02	<0.05	0.22	0.12	<0.02	<0.02	<0.05	5.79	4.70	2.90	0.08	1.80
MW215	8/08/2017	1302_201_MW04-5_170808	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	0.06	<0.02	<0.02	<0.02	0.12	0.06	0.34	<0.02	<0.05	0.26	0.12	<0.02	<0.02	<0.05	6.74	5.50	3.30	0.10	2.20
MW215	28/08/2017	1302_201_MW04_170828	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	0.06	<0.02	<0.02	<0.02	0.11	0.06	0.29	<0.02	<0.05	0.17	0.11	<0.02	<0.02	<0.05	6.42	5.40	3.80	0.07	1.60
MW215	14/11/2017	1302_201_MW04_171114	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	0.06	<0.02	<0.02	<0.02	0.08	0.06	0.23	<0.02	<0.05	0.15	0.12	<0.02	<0.02	<0.05	5.86	5.00	3.60	0.05	1.40
MW215	11/01/2018	1302_201_MW04_180111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	0.05	<0.02	<0.02	<0.02	0.09	0.06	0.29	<0.02	<0.05	0.20	0.11	<0.02	<0.02	<0.05	6.53	5.50	3.90	0.07	1.60
MW215	8/03/2018	1302_201_MW04_180308	Primary	<0.05	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.25	0.08	<0.02	<0.02	<0.02	0.20	0.10	0.64	<0.02	<0.05	0.47	0.17	<0.02	<0.02	<0.05	12.03	9.90	6.60	0.16	3.30
MW215	13/12/2018	1302_201_MW04_181213	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.10	0.06	0.27	<0.02	<0.05	0.17	0.12	<0.02	<0.02	<0.05	6.52	5.60	3.90	0.07	1.70
MW215	20/03/2019	1302_201_MW04_190320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.19	0.06	<0.02	<0.02	<0.02	0.19	0.08	0.35	<0.02	<0.05	0.27	0.12	<0.02	<0.02	<0.05	7.11	5.70	3.60	0.09	2.10
MW215	16/12/2019	1302_MW215_191216	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.10	0.05	0.24	<0.02	<0.05	0.14	0.10	<0.02	<0.02	<0.05	4.65	3.84	2.55	0.05	1.29
MW215	16/04/2020	1302_MW215_200414	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	<0.1	<0.02	<0.02	<0.02	0.18	0.08	0.43	<0.02	<0.05	0.22	0.12	<0.02	<0.02	<0.05	8.79	7.43	4.75	0.11	2.68
MW215	3/11/2020	1302_MW215_201103	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	<0.1	<0.02	<0.02	<0.02	0.19	0.09	0.47	<0.02	<0.05	0.28	0.16	<0.02	<0.02	<0.05	9.38	7.82	5.20	0.13	2.62
MW215	6/05/2021	1302_MW215_210506	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.20	<0.1	<0.02	<0.02	<0.02	0.22	0.08	0.34	<0.02	<0.05	0.27	0.12	<0.02	<0.02	<0.05	9.13	7.78	5.52	0.12	2.26
MW215	11/11/2021	1302_MW215_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.19	<0.1	<0.02	<0.02	<0.02	0.14	0.06	0.39	<0.02	<0.05	0.17	0.11	<0.02	<0.02	<0.05	8.43	7.26	5.45	0.11	1.81
MW215	29/09/2022	1302_MW215_220929	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	<0.1	<0.02	<0.02	<0.02	0.14	0.06	0.35	<0.02	<0.05	0.2	0.09	<0.05	<0.02	<0.02	7.08	5.97	4.2	0.09	1.77

Table T2
Current and Historical Groundwater Analytical Results
Department of Defence
PFAS OMP - RAAF Base Darwin

AECOM

				PFAS (Full Suite)																												
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTrDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																	
PFAS NEMP (2020) FW 99% Species Protection																															0.00023	19	
Human Health Receptors																																	
PFAS NEMP (2020) Human Health Drinking Water																															0.07	0.56	
Location Code	**Sample Date**	**Field ID**	**Sample Type**																														
MW215	23/03/2023	1302_MW215_230323	Primary	<0.05	<0.05	3.50	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.20	0.20	<0.02	<0.02	<0.02	0.24	0.12	0.74	<0.02	<0.02	0.28	0.75	<0.05	<0.02	<0.02	15.50	9.32	6.30	0.15	3.02
MW235	29/09/2022	1302_MW235_220929	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.76	0.2	0.05	<0.02	<0.02	0.44	0.21	1.88	<0.02	0.03	0.81	0.35	<0.05	<0.02	<0.02	27.9	22.7	16.5	0.48	6.22
MW235	22/03/2023	1302_MW235_230322	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.69	0.10	0.08	<0.02	<0.02	0.52	0.20	1.83	<0.02	0.04	0.83	0.42	<0.05	<0.02	<0.02	37.80	32.70	25.60	0.48	7.06
MW240	24/04/2017	1302_243_MW02_170424	Primary	<0.05	<0.05	0.41	1.30	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.30	1.50	<0.02	0.10	<0.02	0.40	3.30	4.90	0.88	<0.05	1.20	2.20	<0.02	<0.02	<0.02	50.89	29.70	23.00	3.70	6.70
MW240	22/08/2017	1302_243_MW02_170822	Primary	<0.05	<0.05	0.62	2.00	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.20	1.90	0.05	0.11	<0.02	1.30	4.30	7.00	1.00	<0.05	2.20	2.90	<0.02	<0.02	0.01	90.09	59.00	48.00	5.50	11.00
MW240	12/01/2018	1302_243_MW02_180112	Primary	<0.05	<0.05	0.84	4.60	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.30	2.30	<0.02	0.15	<0.02	2.50	6.00	9.60	3.10	<0.05	3.20	3.90	<0.02	<0.02	<0.05	147.49	99.00	82.00	10.00	17.00
MW240	31/01/2018	1302_243_MW02C_180131	Primary	<0.05	<0.05	1.70	5.80	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.70	3.80	<0.02	0.43	<0.02	3.10	9.50	16.00	3.50	<0.05	3.60	8.10	<0.02	<0.02	<0.02	178.24	103.00	63.00	16.00	40.00
MW240	31/01/2018	1302_243_MW02B_180131	Primary	<0.05	<0.05	1.90	7.20	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	4.80	4.10	<0.02	0.44	<0.02	3.00	11.00	19.00	3.70	<0.05	3.80	8.10	<0.02	<0.02	<0.05	190.04	107.00	63.00	16.00	44.00
MW240	31/01/2018	1302_243_MW02A_180131	Primary	<0.05	0.01	2.10	5.10	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	7.60	5.90	<0.02	0.36	<0.02	5.10	21.00	29.00	3.70	<0.05	7.80	30.00	<0.02	<0.02	<0.05	291.67	150.00	80.00	24.00	70.00
MW240	8/03/2018	1302_243_MW02_180308	Primary	<0.05	<0.05	0.45	2.30	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.60	2.00	0.06	0.11	<0.02	1.30	4.00	7.30	1.10	<0.05	0.76	3.80	<0.02	<0.02	<0.05	68.88	39.00	29.00	5.10	10.00
MW240	8/05/2018	1302_243_MW02_6_180508	Primary	<0.05	<0.05	0.20	0.89	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.72	1.10	<0.02	0.07	<0.02	0.30	2.60	3.20	0.70	<0.05	1.20	1.60	<0.02	<0.02	0.01	35.39	20.00	16.00	2.80	4.00
MW240	8/05/2018	1302_243_MW02_10_180508	Primary	<0.05	<0.05	0.17	1.00	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.20	1.30	<0.02	0.07	<0.02	0.47	2.90	4.30	0.75	<0.05	2.00	2.30	<0.02	<0.02	0.01	45.37	25.70	20.00	3.20	5.70
MW240	8/05/2018	1302_243_MW02_14_180508	Primary	<0.05	<0.05	0.31	1.40	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.10	1.80	<0.02	0.09	<0.02	0.92	3.80	6.80	0.84	<0.05	2.70	3.00	<0.02	<0.02	0.02	71.58	43.00	32.00	4.80	11.00
MW240	20/03/2019	1302_243_MW02_190320	Primary	<0.05	<0.05	0.19	0.96	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.89	1.40	<0.02	0.09	<0.02	0.70	2.80	3.50	0.84	<0.05	1.20	2.00	<0.02	<0.02	<0.05	40.50	22.30	18.00	3.10	4.30
MW240	16/04/2020	1302_MW240_200414	Primary	<0.05	<0.05	0.51	2.37	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.34	1.20	0.10	0.22	0.08	0.60	3.24	4.98	0.94	0.11	0.91	2.20	<0.02	0.04	0.12	59.10	35.10	24.60	5.05	10.50
MW240	3/11/2020	1302_MW240_201103	Primary	<0.05	<0.05	0.83	3.21	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.01	2.50	0.28	0.19	<0.02	1.65	5.48	10.40	1.61	0.04	1.88	4.21	<0.02	<0.02	<0.05	144.00	102.00	88.90	8.40	12.70
MW240	29/04/2021	1302_MW240_210429	Primary	<0.05	<0.05	0.48	2.21	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.42	1.80	0.07	0.23	<0.02	0.94	4.06	8.00	1.23	0.05	1.14	3.01	<0.02	<0.02	0.04	67.20	38.10	26.50	4.41	11.60
MW240	9/03/2022	1302_MW240_220309	Primary	<0.05	<0.05	0.32	2.43	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.55	1.40	0.06	0.22	<0.02	0.80	2.76	6.79	0.89	0.07	1.28	2.89	<0.02	<0.02	<0.05	51.70	26.50	19.20	3.71	7.34
MW240	23/03/2023	1302_MW240_230323	Primary	<0.05	<0.05	0.38	1.96	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.05	1.40	0.04	0.17	<0.02	0.48	2.94	4.52	0.93	0.05	1.15	2.18	<0.05	<0.02	<0.02	44.80	24.70	17.80	2.85	6.88
MW241	24/04/2017	1302_243_MW03_170424	Primary	<0.05	<0.05	0.33	0.59	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.91	1.20	<0.02	0.05	<0.02	0.41	2.90	3.60	0.66	<0.05	0.82	2.10	<0.02	<0.02	<0.05	40.07	23.30	18.00	3.20	5.30
MW241	12/01/2018	1302_243_MW03_180112	Primary	<0.05	<0.05	0.25	0.82	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.74	1.00	<0.02	0.05	<0.02	0.56	2.50	3.00	0.66	<0.05	0.91	1.80	<0.02	<0.02	<0.05	43.69	28.50	23.00	2.90	5.50
MW241	8/03/2018	1302_243_MW03_180308	Primary	<0.05	<0.05	0.30	0.82	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.99	1.30	<0.02	0.04	<0.02	0.78	2.80	3.80	0.68	<0.05	0.61	3.20	<0.02	<0.02	<0.05	42.62	23.70	17.00	3.60	6.70
MW241	20/03/2019	1302_243_MW03_190320	Primary	<0.05	<0.05	0.13	0.39	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.64	1.20	<0.02	0.04	<0.02	0.39	2.50	2.50	0.57	<0.05	0.72	2.10	<0.02	<0.02	<0.05	26.21	12.30	8.90	2.50	3.40
MW241	16/04/2020	1302_MW241_200414	Primary	<0.05	<0.05	0.12	0.31	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.43	0.50	<0.02	0.03	<0.02	0.23	1.24	1.90	0.34	<0.05	0.28	0.92	<0.02	<0.02	<0.05	19.00	11.10	8.44	1.55	2.68
MW241	3/11/2020	1302_MW241_201103	Primary	<0.05	<0.05	0.11	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.55	1.10	<0.02	0.04	<0.02	0.62	2.28	2.81	0.62	<0.05	0.72	1.99	<0.02	<0.02	<0.05	35.50	22.00	15.70	2.63	6.30
MW241	29/04/2021	1302_MW241_210429	Primary	<0.05	<0.05	0.09	0.31	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.38	0.70	<0.02	0.04	<0.02	0.23	2.31	2.34	0.45	<0.05	0.20	3.79	<0.02	<0.02	<0.05	21.80	9.20	6.26	1.62	3.44
MW241	9/03/2022	1302_MW241_220309	Primary	<0.05	<0.05	0.37	1.32	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.21	1.20	<0.02	0.09	<0.02	0.69	2.30	5.59	0.80	<0.05	0.80	2.47	<0.02	<0.02	<0.05	45.20	25.30	19.00	3.10	6.30
MW241	9/03/2022	1302_QC102_220309	Intralab Dup	<0.05	<0.05	0.36	1.26	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.24	1.20	<0.02	0.08	<0.02	0.66	2.36	5.53	0.77	<0.05	0.80	2.47	<0.02	<0.02	<0.05	44.40	24.60	18.30	3.07	6.26
MW241	9/03/2022	1302_QC201_220309	Interlab Dup	<0.05	<0.05	0.35	0.75	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.65	0.90	<0.02	0.10	<0.02	0.49	1.80	2.40	0.77	<0.05	0.94	1.30	<0.02	<0.02	<0.05	28.05	15.90	12.00	1.70	3.90
MW241	23/03/2023	1302_MW241_230323	Primary	<0.05	<0.05	0.25	1.41	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.81	1.20	<0.02	0.10	<0.02	0.43	3.46	3.52	0.86	<0.02	0.60	2.32	<0.05	<0.02	<0.02	44.70	27.00	21.60	2.70	5.40
MW292	27/04/2017	1302_206_MW04_170427	Primary	<0.05	<0.05	0.43	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.00	<0.1	<0.02	<0.02	<0.02	0.60	0.62	4.70	<0.02	<0.05	0.96	0.76	<0.05	<0.02	<0.05	108.18	97.00	85.00	1.30	12.00
MW292	27/04/2017	1302 DUP02 GW_170427	Intralab Dup	<0.05	<0.05	0.33	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.98	<0.1	<0.02	<0.02	<0.02	1.40	0.40	4.40	<0.02	<0.05	0.94	0.70	<0.02	<0.02	<0.05	98.35	88.00	76.00	1.20	12.00
MW292	27/04/2017	1302_DUP02A_170427	Interlab Dup	<0.05	<0.05	0.15	0.07	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.93	<0.1	<0.02	<0.02	<0.02	1.66	0.28	5.88	0.02	0.18	1.16	0.57	<0.02	<0.02	<0.05	87.80	75.80	67.00	1.12	8.76
MW292	16/04/2020	1302_MW292_200414	Primary	<0.05	<0.05	0.16	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.81	0.10	0.02	<0.02	<0.02	1.78	0.33	3.67	<0.02	0.04	0.78	0.59	<0.02	<0.02	<0.05	67.20	58.00	47.60	0.89	10.40
MW292	4/11/2020	1302_MW292_201104	Primary	<0.05	<0.05	0.26	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.84	<0.1	0.10	<0.02	<0.02	1.09	0.33	3.50	<0.02	0.05	1.12	0.35	<0.02	<0.02	<0.05	67.40	58.90	49.00	0.87	9.87
MW297	1/09/2017	1302_206_MW05_170901	Primary	<0.05	<0.05	<0.05	0.03	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.79	0.18	0.03	<0.02	<0.02	0.51	0.22	1.60	<0.02	<0.05	0.65	0.25	<0.02	<0.02	<0.05	32.79	28.00	23.00	0.53	5.00
MW297	1/09/2017	1302 QC25MW_170901	Interlab Dup	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.59	<0.1	<0.02	<0.02	<0.02	0.34	0.13	0.90	<0.02	<0.05	0.45	0.14	<0.02	<0.02	<0.05	19.20	16.40	12.90	0.34	3.46
MW297	20/03/2019	1302_206_MW05_190320	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	0.06	0.01	<0.02	<0.02	0.09	0.05	0.32	<0.02	<0.05	0.12	0.07	<0.02	<0.02	<0.05	6.88	5.80	4.70	0.11	1.10
MW297	17/12/2019	1302_MW297_191216	Primary	<0.05	<0.05	0.06	0.08	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.08	0.40	0.05	<0.02	<0.02	2.23	0.67	4.29	<0.02	0.03	2.75	0.74	<0.02	<0.02	<0.05	91.00	76.30	58.20	1.31	18.10
MW297	16/04/2020	1302_MW297_200414	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	<0.1	<0.02	<0.02	<0.02	0.18	0.07	0.51	<0.02	<0.05	0.17	0.07	<0.02	<0.02	<0.05	11.20	9.78	7.98	0.15	1.80
MW297	4/11/2020	1302_MW297_201104	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.48	0.10	0.06	<0.02	<0.02	0.50	0.20	1.16	<0.02	<0.05	0.68	0.14	<0.02	<0.02	<0.05	34.40	30.60	25.60	0.49	5.03
MW297	29/04/2021	1302_MW297_210429	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	0.03	<0.02	<0.02	0.05	0.03	0.22	<0.02	<0.05	0.09	0.04	<0.02	<0.02	<0.05	4.19	3.60	2.80	0.05	0.80
MW297	11/11/2021	1302_MW297_211111	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.18	<0.1	0.06	<0.02	<0.02	1.18	0.45	3.71	<0.02	0.02	0.90	0.52	<0.02	<0.02	<0.05	47.10	38.10	28.30	1.04	9.76
MW297	8/03/2022	1302_MW297_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.10	<0.02	<0.05	0.04	<0.02	<0.02	<0.02	<0.05	1.63	1.44	1.07	0.02	0.37
MW297	29/09/2022	1302_MW297_220929	Primary	<0.05	<0.05	<0.05	0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.92	0.2	0.07	<0.02	<0.02	0.82	0.34	2.16	<0.02	<0.02	1.08	0.29	<0.05	<0.02	<0.02	48.5	41.8	35.2	0.75	6.62
MW297	14/03/2023	1302_MW297_230314	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.05	<0.1	<0.02	<0.02	<0.02	1.03	0.62	4.70	<0.02	<0.05	2.07	0.03	<0.05	<0.02	<0.02	2.43	2.02	1.32	0.05	0.70
MW303	5/09/2017	1302 207 MW04 170905	Primary	<0.05	<0.05	0.11	0.03	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	6.10	1.40	<0.02	<0.02	<0.02	2.70	1.60	11.00	0.03	<0.05	4.20	2.30	<0.02	<0.02	<0.05	141.17	108.00	57.00	3.70	51.00
MW303	5/09/2017	1302_QC36MW_170905	Intralab Dup	<0.05	<0.05	0.11	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	6.40	1.50	<0.02	<0.02	<0.02	2.70	1.80	11.00	0.03	<0.05	4.20	2.40	<0.02	<0.02	<0.05	140.96	107.00	56.00	3.80	51.00
MW303	25/01/2018	1302_207_MW04A_180125	Primary	<0.05	<0.05	0.09	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.90	0.54	<0.02	<0.02	<0.02	1.10	0.52	4.20	0.01	<0.05	2.40	0.88	<0.02	<0.02	<0.05	61.86	49.00	30.00	1.20	19.00
MW303	25/01/2018	1302_207_MW04B_180125	Primary	<0.05	<0.05	0.09	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.00	0.57	<0.02	<0.02	<0.02	1.20	0.57	4.30	0.01	<0.05	2.50	0.97	<0.02	<0.02	<0.05	67.63	54.00	35.00	1.40	19.00
MW303	25/01/2018	1302_207_MW04C_180125	Primary	<0.05	<0.05	0.10	0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.70	0.74	<0.02	<0.02	<0.02	1.60	0.79	5.90	0.02	<0.05	3.70	1.20	<0.02	<0.02	<0.05	88.67	70.00	43.00	1.90	27.00
MW303	13/12/2018	1302 207 MW04 181213	Primary	<0.05	<0.05	0.14	0.03	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	6.40	1.20	0.07	<0.02	<0.02	2.50	1.60	10.00	0.02	0.09	6.40	2.00	<0.02	<0.02	<0.05	162.75	129.00	81.00	3.30	48.00
MW303	20/03/2019	1302_207_MW04_190320	Primary	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.90	0.53	<0.02	<0.02	<0.02	0.87	0.43	3.50	<0.02	<0.05	1.80	0.67	<0.02	<0.02	<0.05	43.56	32.00	19.00	0.87	13.00
MW303	16/04/2020	1302_MW303_200414	Primary	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.67	0.60	<0.02	<0.02	<0.02	1.55	0.56	4.99	<0.02	0.02	2.46	0.84	<0.02	<0.02	<0.05	61.70	46.70	27.70	1.22	19.00
MW303	3/11/2020	1302_MW303_201103	Primary	<0.05	<0.05	0.11	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	5.84	1.00	<0.02	<0.02	<0.02	3.48	1.52	12.20	0.02	0.05	7.24	1.86	<0.02	<0.02	<0.05	167.00	131.00	84.80	3.12	46.10
MW303	29/04/2021	1302_MW303_210429	Primary	<0.05	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.95	1.00	<0.02	<0.02	<0.02	2.13	0.78	8.00	<0.02	<0.05	4.54	1.24	<0.02	<0.02	<0.05	73.90	51.80	21.80	1.39	30.00
MW303	9/11/2021	1302_MW303_211109	Primary	<0.05	<0.05	0.11	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	6.58	1.10	0.02	<0.02	<0.02	2.04	1.55	14.50	<0.02	0.05	7.08	1.98	<0.02	<0.02	<0.05	134.00	95.60	54.30	3.34	41.30
MW303	8/03/2022	1302_MW303_220308	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.62	0.30	<0.02	<0.02	<0.02	1.05	0.35	3.54	<0.02	0.02	2.10	0.53	<0.02	<0.02	<0.05	42.10	31.80	18.80	0.77	13.00
MW303	8/03/2022	1302_QC101_220308	Intralab Dup	<0.05	<0.05	0.06	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.99	0.40	<0.02	<0.02	<0.02	1.24	0.39	4.11	<0.02	<0.05	2.54	0.63	<0.02	<0.02	<0.05	45.10	32.90	19.10	0.84	13.80
MW303	29/09/2022	1302_MW303_220929	Primary	<0.05	<0.05	0.1	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	5.45	1.1	<0.02	<0.02	<0.02	2.64	1.39	11.4	<0.02	0.04	7.69	1.63	<0.05	<0.02	<0.02	116	81.3	49.9	3	31.4
MW303	22/03/2023	1302_MW303_230322	Primary	<0.05	<0.05	0.07	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.01	0.70	<0.02	<0.02	<0.02	2.05	0.85	8.26	<0.02	0.02	4.16	1.32	<0.05	<0.02	<0.02	77.10	54.90	26.80	1.80	28.10

Table T2
Current and Historical Groundwater Analytical Results
Department of Defence
PFAS OMP - RAAF Base Darwin

AECOM

				PFAS (Full Suite)																												
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTrDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																	
PFAS NEMP (2020) FW 99% Species Protection																															0.00023	19	
Human Health Receptors																																	
PFAS NEMP (2020) Human Health Drinking Water																															0.07		0.56	
Location Code	**Sample Date**	**Field ID**	**Sample Type**																														
MW405	24/08/2017	1031MWBLD33-SOUTH_170824	Primary	<0.05	<0.05	0.36	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	0.07	<0.02	<0.02	<0.02	0.15	0.09	0.42	<0.02	<0.05	0.22	0.23	<0.02	<0.02	<0.05	11.16	9.30	6.60	0.11	2.70
MW405	13/11/2017	1302_BLD33-STH_171113	Primary	<0.05	<0.05	0.30	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	0.07	<0.02	<0.02	<0.02	0.09	0.12	0.31	<0.02	<0.05	0.16	0.23	<0.02	<0.02	<0.05	7.67	6.20	4.50	0.08	1.70
MW405	12/01/2018	1302_BLD33-STH_180112	Primary	<0.05	<0.05	0.21	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.45	0.14	<0.02	<0.02	<0.02	0.53	0.22	0.99	0.01	<0.05	0.59	0.34	<0.02	<0.02	<0.05	46.03	42.20	36.00	0.35	6.20
MW405	2/02/2018	1301_BLD33_SOUTGB_180202	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.34	0.08	<0.02	<0.02	<0.02	0.69	0.11	0.75	<0.02	<0.05	0.41	0.14	<0.02	<0.02	<0.05	20.70	17.90	13.00	0.28	4.90
MW405	2/02/2018	1301_BLD33_SOUTGA_180202	Primary	<0.05	<0.05	0.07	0.03	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.38	0.09	<0.02	<0.02	<0.02	0.75	0.13	0.80	<0.02	<0.05	0.44	0.16	<0.02	<0.02	<0.05	20.24	17.10	12.00	0.29	5.10
MW405	2/02/2018	1301_BLD33_SOUTGC_180202	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.25	0.09	<0.02	<0.02	<0.02	0.32	0.09	0.50	<0.02	<0.05	0.36	0.15	<0.02	<0.02	<0.05	15.86	13.90	9.90	0.20	4.00
MW405	6/03/2018	1302_BLD33_STH_180306	Primary	<0.05	<0.05	<0.05	0.01	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	0.01	<0.02	<0.02	0.05	0.01	0.10	<0.02	<0.05	0.07	0.02	<0.02	<0.02	<0.05	2.40	2.03	1.40	0.04	0.63
MW405	15/12/2018	1302_BLD33_STH_181215	Primary	<0.05	<0.05	0.30	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	0.10	<0.02	<0.02	<0.02	0.40	0.13	0.54	<0.02	<0.05	0.26	0.26	<0.02	<0.02	<0.05	13.15	10.80	8.10	0.14	2.70
MW405	20/03/2019	1302_BLD33_SOUTH_190320	Primary	<0.05	<0.05	0.15	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.84	0.20	<0.02	<0.02	<0.02	0.62	0.21	1.20	<0.02	<0.05	1.30	0.28	<0.02	<0.02	<0.05	40.32	34.70	28.00	0.36	6.70
MW405	17/12/2019	1302_MW405_191217	Primary	<0.05	<0.05	0.28	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.11	0.08	0.29	<0.02	<0.05	0.10	0.20	<0.02	<0.02	<0.05	5.95	4.72	3.48	0.06	1.24
MW405	16/04/2020	1302_MW405_200414	Primary	<0.05	<0.05	0.13	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.76	0.10	<0.02	<0.02	<0.02	0.56	0.17	1.11	<0.02	<0.05	0.66	0.25	<0.02	<0.02	<0.05	26.80	22.80	16.70	0.33	6.07
MW422	17/12/2019	1302_MW422_191217	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.73	1.00	<0.02	<0.02	<0.02	2.11	0.65	5.42	0.02	<0.05	4.26	1.68	<0.02	<0.02	<0.05	79.10	59.20	41.00	1.04	18.20
MW422	16/04/2020	1302_MW422_200414	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	4.34	0.90	0.03	<0.02	<0.02	1.92	0.88	7.68	0.03	0.02	4.08	1.65	<0.02	<0.02	<0.05	105.00	81.60	51.60	1.51	30.00
MW422	2/11/2020	1302_MW422_201102	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.35	0.90	<0.02	<0.02	<0.02	2.16	0.83	7.16	<0.02	<0.05	4.79	1.38	<0.02	<0.02	<0.05	96.20	74.30	51.10	1.31	23.20
MW422	6/05/2021	1302_MW422_210506	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	3.48	0.90	0.07	<0.02	<0.02	1.99	1.00	8.01	0.04	0.05	3.71	1.92	<0.02	<0.02	<0.05	97.00	73.80	47.30	2.01	26.50
MW422	10/11/2021	1302_MW422_211110	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	4.44	1.00	0.11	<0.02	<0.02	3.43	0.88	11.00	0.04	0.05	3.22	1.80	<0.02	<0.02	<0.05	100.00	73.00	45.60	1.56	27.40
MW422	9/03/2022	1302_MW422_220309	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	39.40	6.30	0.20	<0.02	<0.02	9.88	5.65	71.20	0.10	0.09	33.20	14.00	<0.02	<0.02	<0.05	521.00	328.00	93.30	12.50	235.00
MW451	28/09/2022	1302_MW451_220928	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.02	0.02	0.02	<0.01	<0.01
MW451	23/03/2023	1302_MW451_230323	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.05	<0.02	0.09	<0.02	<0.02	0.08	0.03	<0.05	<0.02	<0.02	2.73	2.38	1.54	0.04	0.84
MW452	28/09/2022	1302_MW452_220928	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.08	0.02	0.14	<0.02	<0.02	0.12	0.03	<0.05	<0.02	<0.02	4.84	4.33	2.72	0.04	1.61
MW452	23/03/2023	1302_MW452_230323	Primary	<0.05	<0.05	0.63	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.11	0.08	0.39	<0.02	<0.02	0.19	0.23	<0.05	<0.02	<0.02	6.59	4.74	2.91	0.09	1.83
MW453	23/03/2023	1302_MW453_230323	Primary	<0.05	<0.05	0.53	0.18	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.35	1.70	<0.02	<0.02	<0.02	0.37	4.07	6.07	0.35	<0.02	1.37	2.75	<0.05	<0.02	<0.02	34.80	12.60	5.26	3.42	7.35
MW454	29/09/2022	1302_MW454_220929	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	2.43	0.4	<0.02	<0.02	<0.02	1.13	0.42	3.86	<0.02	<0.02	2.75	0.66	<0.05	<0.02	<0.02	55.7	43.2	28	0.81	15.2
MW454	22/03/2023	1302_MW454_230322	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.31	0.30	<0.02	<0.02	<0.02	1.18	0.23	2.15	<0.02	<0.02	1.84	0.50	<0.05	<0.02	<0.02	48.90	40.80	28.20	0.57	12.60
MW454	22/03/2023	1302_QC102_230322	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	1.35	0.30	<0.02	<0.02	<0.02	1.28	0.25	2.23	<0.02	<0.02	1.84	0.53	<0.05	<0.02	<0.02	49.30	40.90	28.00	0.59	12.90
MW454	22/03/2023	1302_QC202_230322	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	1.00	0.23	<0.01	<0.01	<0.01	0.48	0.18	1.60	<0.01	<0.01	1.10	0.36	<0.02	<0.02	<0.01	27.15	22.20	14.00	0.36	8.20

Notes:
* = MW209 and MW211 have historically been incorrectly labelled. Location ID's have been corrected in this table.
ND: non detect
µg/L: micrograms per litre

Table T3
Current and Historical Surface Water Field Results
PFAS OMP - RAAF Base Darwin
Department of Defence

Site	Location	Date	DO	Temperature	Redox Potential	Corrected Redox	Electrical Conductivity	pH
			mg/L	°C	mV	mV	µS/cm	pH Units
1302	SW104	21/01/2020	3.60	29.8	207.3	412.3	40.2	6.45
1302	SW106	21/01/2020	3.95	29.5	198.7	403.7	59.6	6.26
1302	SW108	21/01/2020	3.50	28.6	183.3	388.3	63.2	6.14
1302	SW109	21/01/2020	3.80	28.2	161.2	366.2	65.3	6.09
1302	SW112	21/01/2020	4.20	27.5	168.2	373.2	1012.0	6.55
1302	SW113	21/01/2020	5.60	28.7	166.2	371.2	23899.0	7.44
1302	SW114	21/01/2020	4.60	28.8	188.8	393.8	32.9	6.5
1302	SW115	21/01/2020	2.21	30.6	202.6	407.6	55.0	5.94
1302	SW120	21/01/2020	3.95	28	163.1	368.1	6178.0	7.11
1302	SW124	21/01/2020	3.45	28.9	176	381.0	50147.0	7.68
1302	SW125	21/01/2020	4.60	30.2	156.3	361.3	273.1	7.13
1302	SW168	21/01/2020	3.46	30.8	182.3	387.3	41.9	5.56
1302	SW113	22/01/2020	5.19	26.1	169.6	374.6	1372.0	7.39
1302	SW124	22/01/2020	4.50	26.1	163.3	368.3	4051.0	7.88
1302	SW160	22/01/2020	5.10	25.1	188.9	393.9	15.6	7.4
1302	SW132	23/01/2020	3.31	29.9	191.7	396.7	74.3	6.4
1302	SW133	23/01/2020	2.36	31.3	84.6	289.6	142.3	6.34
1302	SW104	16/12/2020	3.59	29.3	150.5	355.5	23.3	8
1302	SW106	16/12/2020	3.41	28.6	164.6	369.6	52.7	7.18
1302	SW108	16/12/2020	4.65	28	178.1	383.1	42.4	6.97
1302	SW109	16/12/2020	4.01	28.6	187.7	392.7	39.4	6.52
1302	SW112	16/12/2020	2.51	27.7	159.2	364.2	2877.0	7.76
1302	SW113	16/12/2020	2.99	28.7	190.1	395.1	23991.0	7.05
1302	SW114	16/12/2020	4.00	29.9	130.8	335.8	75.2	8.14
1302	SW115	16/12/2020	4.88	28.8	146.1	351.1	19.5	7.68
1302	SW120	16/12/2020	3.08	28.4	151.2	356.2	20304.0	7.25
1302	SW124	16/12/2020	5.71	29.7	147.2	352.2	44573.0	7.39
1302	SW125	16/12/2020	4.22	30.8	127	332.0	1120.0	8.2
1302	SW168	16/12/2020	3.99	30.2	189.2	394.2	29.0	6.37
1302	SW132	17/12/2020	2.93	27.2	164.9	369.9	53.1	7.54
1302	SW133	17/12/2020	2.90	28.8	93.4	298.4	465.0	9.55
1302	SW143	17/12/2020	3.92	30.4	147.7	352.7	19006.0	8.13
1302	SW285	17/12/2020	4.51	31.5	112.1	317.1	245.9	8.77
1302	SW274	17/12/2020	4.32	28	179.6	384.6	49.6	6.56
1302	SW286	17/12/2020	4.21	28.5	188.5	393.5	39.0	6.58
1302	SW181	18/12/2020	4.98	31.7	-	-	97.8	8.46
1302	SW170	19/01/2021	2.80	29	286	491.0	170.6	7.4
1302	SW270	19/01/2021	3.62	27.6	106.2	311.2	49.6	7.66
1302	SW162	20/01/2021	3.73	28.5	-	-	26.9	7.7
1302	SW170	20/01/2021	2.80	29	-	-	170.6	7.4
1302	SW178	20/01/2021	3.13	27.5	124.4	329.4	45.8	7.9
1302	SW181	20/01/2021	3.77	7.93	-	-	170.6	7.44
1302	SW273	20/01/2021	2.83	29	65.1	270.1	116.4	8.16
1302	SW275	20/01/2021	1.36	28.8	-	-	74.0	6.64
1302	SW125	26/02/2021	6.97	30.3	174.9	379.9	197.6	5.69
1302	SW170	26/02/2021	6.68	29.3	185.9	390.9	64.9	5.35
1302	SW109	26/02/2021	6.00	27.9	199.8	404.8	43.8	4.81
1302	SW125	18/03/2021	0.00	33.8	-8.2	196.8	180.7	6.89
1302	SW104	6/04/2021	2.22	29	259.4	464.4	69.5	6.81
1302	SW106	28/04/2021	3.30	29.5	167.3	372.3	63.2	6.37
1302	SW108	28/04/2021	3.99	27.8	217.8	422.8	61.2	5.78
1302	SW109	28/04/2021	3.33	29.2	154.2	359.2	235.7	7.31
1302	SW112	28/04/2021	1.59	27.9	47.8	252.8	49282.0	8.02
1302	SW113	28/04/2021	3.21	28.7	160.7	365.7	71125.0	7.64
1302	SW114	28/04/2021	5.36	31.2	190.9	395.9	86.2	6.3
1302	SW115	28/04/2021	1.13	32	153	358.0	113.3	6
1302	SW120	28/04/2021	2.68	27.7	102.6	307.6	71652.0	8.09
1302	SW124	28/04/2021	3.09	28.3	97	302.0	71584.0	7.84
1302	SW132	28/04/2021	4.26	27.9	129.5	334.5	71.7	5.63
1302	SW133	28/04/2021	4.59	29.4	128.2	333.2	28.4	5.91
1302	SW143	28/04/2021	3.65	29.1	145.6	350.6	97.1	5.98
1302	SW168	28/04/2021	3.65	32.2	203.2	408.2	67.6	5.83
1302	SW180	28/04/2021	3.51	31.9	244	449.0	77.0	5.19
1302	SW270	28/04/2021	3.76	28.6	125.9	330.9	61.2	5.06
1302	SW273	28/04/2021	2.83	29	65.1	270.1	116.4	8.16
1302	SW274	28/04/2021	3.30	29.5	162.3	367.3	63.2	6.37
1302	SW275	28/04/2021	1.36	28.8	226.6	431.6	74.0	6.64
1302	SW285	28/04/2021	4.44	27.6	70.8	275.8	1638.0	9.42
1302	SW286	28/04/2021	3.33	29.2	154.2	359.2	235.7	7.31
1302	SW101	29/04/2021	1.31	31.9	178.1	383.1	50.6	5.27
1302	SW162	29/04/2021	2.58	32.8	127.4	332.4	48.6	5.62
1302	SW170	29/04/2021	3.02	32.2	171.3	376.3	68.8	5.57
1302	SW170	13/01/2022	3.56	31.6	94.9	296.4	90.9	6.67
1302	SW104	14/01/2022	3.29	30.6	177.9	380.1	90.2	6.81
1302	SW106	14/01/2022	3.34	29.1	112.1	315.4	285.1	8
1302	SW108	13/01/2022	3.50	29.2	162.3	365.5	59.9	5.99
1302	SW109	13/01/2022	3.15	29.5	153.1	356.1	65.8	6.07
1302	SW112	14/01/2022	3.58	29.7	133.1	336.0	558.0	6.56
1302	SW113	14/01/2022	3.35	30.2	156.3	358.8	7296	6.29
1302	SW114	14/01/2022	2.34	31.1	153.9	355.7	180.1	7.08
1302	SW115	14/01/2022	2.40	29.4	104.8	307.9	52.1	8.25
1302	SW120	14/01/2022	3.14	28.8	140.2	343.7	6132	6.79
1302	SW124	14/01/2022	3.14	31.3	156.8	358.5	24913	6.71
1302	SW125	14/01/2022	3.79	31.3	88.5	290.2	671	8.13
1302	SW132	14/01/2022	3.12	31.2	53.7	255.5	301	7.97
1302	SW133	14/01/2022	4.31	32.3	102.1	303.0	461.1	7.69
1302	SW143	14/01/2022	3.66	32.1	114.4	315.5	2329	7.43
1302	SW152	17/01/2022	3.27	28.2	118.9	322.9	87.4	7.3

Table T3
Current and Historical Surface Water Field Results
PFAS OMP - RAAF Base Darwin
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1302	SW156	17/01/2022	3.99	27.5	106.5	311.0	58	7.83
1302	SW160	17/01/2022	4.50	28.6	105.1	308.8	42	7.93
1302	SW162	13/01/2022	3.69	31.4	118.6	320.2	50.7	6.77
1302	SW168	13/01/2022	4.25	31.7	205.1	406.5	51.3	5.61
1302	SW178	17/01/2022	3.59	27.7	108.8	313.2	52.3	7.96
1302	SW181	17/01/2022	4.28	27.9	105.5	309.7	95	7.82
1302	SW106	15/03/2022	5.28	31.2	83.6	285.4	48.2	5.9
1302	SW108	15/03/2022	4.61	30.6	88.5	290.7	47.2	5.5
1302	SW109	14/03/2022	3.77	30.7	60.3	262.4	55.1	6.22
1302	SW112	16/03/2022	7.50	28.9	57.4	260.9	760	7.28
1302	SW113	16/03/2022	4.71	30	119.4	322.1	18244	7.43
1302	SW114	14/03/2022	4.09	32	91	292.2	45	4.98
1302	SW115	14/03/2022	3.89	32.4	79.6	280.5	48.5	5.66
1302	SW120	15/03/2022	3.01	29.8	103.3	306.1	3098	7.1
1302	SW124	16/03/2022	3.98	30.5	105.5	307.8	38563	7.91
1302	SW125	15/03/2022	5.56	31.6	98.3	299.8	174.6	6.79
1302	SW132	15/03/2022	4.13	31.8	86.2	287.5	50.8	5.73
1302	SW133	15/03/2022	5.00	32.4	81	281.9	173.6	6.55
1302	SW143	16/03/2022	6.27	29.8	57.1	259.9	3019	8.25
1302	SW152	14/03/2022	6.17	33.1	84.7	285.0	69.6	5.56
1302	SW162	14/03/2022	3.34	31.7	79.3	280.7	48.7	6.36
1302	SW168	15/03/2022	4.11	33.8	90.5	290.3	120.2	5.17
1302	SW170	14/03/2022	5.03	31.5	98.7	300.2	154.4	5.53
1302	SW178	14/03/2022	5.38	29.9	84.5	287.2	55.1	6.75
1302	SW181	14/03/2022	5.61	29.3	74.5	277.7	57.4	6.71
1302	SW109	30/06/2022	3.65	22.7	-215.4	-7.3	180.2	5.86
1302	SW109	26/08/2022	2.78	22.9	64.3	272.2	431	5.12
1302	SW104	23/11/2022	1.04	27.8	48.1	248.1	38.4	5.53
1302	SW106	23/11/2022	-	29.3	72.4	272.4	76.7	5.43
1302	SW108	23/11/2022	-	29.2	23.9	223.9	68.4	5.22
1302	SW109	23/11/2022	-	29.6	49.3	249.3	75.9	5.71
1302	SW112	23/11/2022	-	31.1	19.8	219.8	13292	7.2
1302	SW113	23/11/2022	0.45	31.1	-56.4	143.6	49197	7.88
1302	SW114	23/11/2022	-	31.6	72.9	272.9	15.9	5.7
1302	SW115	23/11/2022	-	31.2	84.1	284.1	67.4	6.71
1302	SW120	23/11/2022	-	29.2	-0.6	199.4	29354	7.48
1302	SW124	23/11/2022	0.10	30.2	36.6	236.6	58105	7.78
1302	SW125	23/11/2022	1.21	30.3	100.6	300.6	84.4	8.72
1302	SW132	24/11/2022	-	28.4	60.6	260.6	69.2	5.47
1302	SW133	24/11/2022	-	28.5	49.2	249.2	138	6.47
1302	SW143	24/11/2022	0.93	31.1	62.1	262.1	45286	7.43
1302	SW156	23/11/2022	-	34.3	38.4	238.4	78.5	5.72
1302	SW160	25/11/2022	1.20	30.1	-75	125.0	40.9	5.3
1302	SW162	25/11/2022	0.94	30.4	29.1	229.1	19.8	6.31
1302	SW168	23/11/2022	0.62	32	81	281.0	43.7	5.47
1302	SW170	24/11/2022	0.96	29.6	17.6	217.6	53.1	7
1302	SW178	25/11/2022	-	29	7.2	207.2	67.9	6.79
1302	SW181	25/11/2022	1.87	31	-70	130.0	13.1	5.22
1302	SW300	25/11/2022	0.83	29	-97.6	102.4	20	5.82
1302	SW109	22/12/2022	4.83	26.5	167.8	367.8	37.8	5.8
1302	SW170	22/12/2022	5.30	26	163.3	363.3	37.8	6.37
1302	SW312	22/12/2022	6.81	26.3	104.3	304.3	38.2	8.01
1302	SW109	25/01/2023	3.89	28.3	156.3	356.3	156.2	5.44
1302	SW170	25/01/2023	3.50	29.8	161.3	361.3	95.3	5.72
1302	SW300	25/01/2023	4.04	27.7	170	370.0	157.9	5.01
1302	SW312	25/01/2023	4.55	28.8	148.6	348.6	82.7	7.18
1302	SW109	23/02/2023	6.45	29.4	53.9	253.9	41.9	6.17
1302	SW170	21/02/2023	6.59	27.8	68.2	268.2	29.3	6.67
1302	SW312	21/02/2023	6.59	28.3	63.5	263.5	24.9	6.4
1302	SW300	21/02/2023	6.57	28.6	76.7	276.7	37	6.13
1302	SW104	27/03/2023	2.30	31.6	67.2	267.2	29.9	5.37
1302	SW106	27/03/2023	3.95	30.4	53.3	253.3	46.2	6.26
1302	SW108	27/03/2023	4.08	29.9	74.8	274.8	47.6	5.69
1302	SW109	27/03/2023	3.91	30.1	83.6	283.6	49.4	5.67
1302	SW112	28/03/2023	3.79	27.9	100.7	300.7	453.9	6.81
1302	SW113	28/03/2023	4.03	28.5	127.1	327.1	8889	6.79
1302	SW114	27/03/2023	3.60	31.4	84.7	284.7	52.2	5.56
1302	SW115	27/03/2023	3.34	30.3	67.4	267.4	37.9	6.23
1302	SW120	28/03/2023	3.04	28.7	115.3	315.3	3520.8	7.01
1302	SW124	28/03/2023	3.63	30.2	108.3	308.3	3129	7.71
1302	SW125	28/03/2023	4.76	30.3	68.2	268.2	344.7	7.27
1302	SW132	27/03/2023	3.42	28.2	33.1	233.1	52.3	6.18
1302	SW133	27/03/2023	3.35	29.6	48.1	248.1	22.4	6.85
1302	SW143	28/03/2023	4.06	31.6	103.6	303.6	5779	7.35
1302	SW152	28/03/2023	3.91	27.2	98.1	298.1	51.8	5.73
1302	SW156	28/03/2023	4.55	28.9	85.6	285.6	31.3	6.56
1302	SW160	28/03/2023	3.07	29.5	99.6	299.6	44.8	6.26
1302	SW162	28/03/2023	3.94	25.6	102.6	302.6	24.9	6.29
1302	SW168	27/03/2023	3.53	33.9	86.2	286.2	49.5	5.15
1302	SW170	28/03/2023	3.93	24.9	100.7	300.7	24	6.21
1302	SW178	28/03/2023	4.41	25.5	106.6	306.6	31.2	6.65
1302	SW181	28/03/2023	4.58	25.4	103.6	303.6	27.1	6.46
1302	SW300	27/03/2023	3.38	32.4	78	278.0	53.9	5.63
1302	SW312	28/03/2023	4.79	26.3	99	299.0	22.9	6.43
1302	SW109	27/03/2023	3.91	30.1	83.6	283.6	49.4	5.67
1302	SW170	28/03/2023	3.93	24.9	100.7	300.7	24	6.21
1302	SW300	27/03/2023	3.38	32.4	78	278.0	53.9	5.63
1302	SW312	28/03/2023	4.79	26.3	99	299.0	22.9	6.43
1302	SW109	14/04/2023	4.72	28.4	83.2	283.2	45.3	5.69
1302	SW170	14/04/2023	0.48	27.8	83.9	283.9	49.9	6.8
1302	SW300	14/04/2023	5.12	30.4	82.9	282.9	57.4	5.64
1302	SW312	14/04/2023	0.61	27.8	48.3	248.3	29	6.89

Table T4
Current and Historical Surface Water Analytical Results
PFAS OMP - RAAF Base Darwin
Department of Defence

AECOM

	PFAS (Full Suite)																												
	10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTeDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
	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
LOR	0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																														
PFAS NEMP (2020) FW 99% Species Protection																												0.00023	19	
Human Health Receptors																														
NHMRC (2019) PFAS Recreational Water																											2		10	

Location Code	Field ID	Sample Date	Sample Type																											
SW101	1302_SW101_171207	7/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	0.05	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.22	0.16	0.11	<0.01	0.05
SW101	1302_SW101_180108	8/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.18	0.18	0.14	<0.01	0.04
SW101	1302_SW101_180307	7/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	0.16	0.12	0.09	<0.01	0.03
SW101	1302_SW101_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	0.23	0.23	0.18	<0.01	0.05
SW101	1302_SW101_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	0.11	0.11	0.08	<0.01	0.03
SW101	1302_SW101_210429	29/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	0.2	0.18	0.13	<0.01	0.05
SW104	1302_SW104_180109	9/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.06	<0.02	<0.05	0.06	<0.02	<0.02	<0.02	<0.05	1.83	1.61	1.1	0.02	0.51
SW104	1302_SW104_180309	9/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.05	0.04	0.01	<0.02	<0.02	<0.05	0.85	0.7	0.47	0.01	0.23
SW104	1302_SW104_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.03	<0.02	<0.05	0.09	<0.02	<0.02	<0.02	<0.05	2.08	1.84	1.1	<0.01	0.74
SW104	1302_SW104_190318	18/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.12	0.12	0.07	<0.01	0.05
SW104	1302_SW104_200122	21/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.11	<0.02	<0.05	0.07	0.02	<0.02	<0.02	<0.05	2.13	1.82	1.26	0.02	0.56
SW104	1302_SW104_200415	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.2	<0.1	<0.02	<0.02	<0.02	0.1	0.02	0.29	<0.02	<0.05	0.19	0.06	<0.02	<0.02	<0.05	4.5	3.57	2.08	0.07	1.49
SW104	1302_SW104_201216	16/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.02	0.02	0.02	<0.01	<0.01
SW104	1302_SW104_210506	6/05/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.12	<0.02	<0.05	0.05	0.02	<0.02	<0.02	<0.05	1.98	1.67	1.2	0.03	0.47
SW104	1302_SW104_220114	14/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.08	<0.02	0.12	<0.02	<0.05	0.05	<0.02	<0.02	<0.02	<0.05	2.07	1.74	1.24	0.02	0.5
SW104	1302_SW104_221123	23/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.07	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	1.16	0.94	0.63	0.02	0.31
SW104	1302_SW104_230327	27/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.29	<0.02	<0.02	0.15	0.06	<0.05	<0.02	<0.02	4.48	3.7	2.46	0.05	1.24
SW106	RC2_SW002_170404	4/04/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.08	0.01	<0.05	0.03	0.02	<0.02	<0.02	<0.05	1.19	0.98	0.65	0.02	0.33
SW106	1302_SWRC07_170426	26/04/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	0.01	0.08	0.02	<0.05	0.04	0.02	<0.02	<0.02	<0.05	1.27	1.01	0.65	0.03	0.36
SW106	1302_SWRC07_20170629	29/06/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.06	0.02	<0.05	0.04	0.02	<0.02	<0.02	<0.05	1.01	0.8	0.52	0.01	0.28
SW106	1302_QC1SW_20170629	29/06/2017	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.06	0.02	<0.05	0.03	0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.54	0.01	0.28
SW106	1302_SW106_170726	26/07/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	0.01	<0.05	0.03	0.01	<0.02	<0.02	<0.05	0.7	0.56	0.35	0.01	0.21
SW106	1302_SW106_171024	24/10/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.18	0.18	0.14	<0.01	0.04
SW106	1302_SW106_171118	18/11/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	0.01	<0.02	<0.02	<0.02	<0.05	0.25	0.2	0.08	<0.01	0.12
SW106	1302_SW106_171205	5/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.7	0.61	0.37	<0.01	0.24
SW106	1302_SW106_180109	9/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.03	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.7	0.62	0.4	<0.01	0.22
SW106	1302_SW106_180216	16/02/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.04	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.92	0.82	0.61	0.01	0.21
SW106	1302_SW106_180222	22/02/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.05	0.02	0.01	<0.02	<0.02	<0.05	1.1	0.99	0.74	0.01	0.25
SW106	1302_SW106_180301	1/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.05	0.03	0.01	<0.02	<0.02	<0.05	0.87	0.74	0.54	0.01	0.2
SW106	1302_SW106_180308	8/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.05	0.03	0.01	<0.02	<0.02	<0.05	1.02	0.87	0.62	0.01	0.25
SW106	1302_SW106_180321	21/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.02	0.02	0.1	<0.02	<0.05	0.08	0.04	<0.02	<0.02	<0.05	1.61	1.25	0.86	0.04	0.39
SW106	1302_SW106_180329	29/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.06	0.01	<0.05	0.03	0.01	<0.02	<0.02	<0.05	1.08	0.9	0.61	0.02	0.29
SW106	1302_SW106_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.5	0.43	0.27	<0.01	0.16
SW106	1302_SW106_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.05	0.01	<0.05	0.02	0.02	<0.02	<0.02	<0.05	0.79	0.64	0.42	0.01	0.22
SW106	1302_QCSW04_190319	19/03/2019	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.08	0.01	<0.05	0.02	0.03	<0.02	<0.02	<0.05	0.77	0.58	0.37	0.02	0.21
SW106	1302_SW106_191115	15/11/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.47	0.41	0.23	<0.01	0.18
SW106	1302_SW106_200121	21/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.69	0.62	0.43	<0.01	0.19
SW106	1302_SW106_200415	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.76	0.65	0.41	0.01	0.24
SW106	1302_SW106_201216	16/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.94	0.8	0.52	0.01	0.28
SW106	1302_SW106_210428	28/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.05	0.03	0.02	<0.02	<0.02	<0.05	0.88	0.71	0.41	0.02	0.3
SW106	1302_SW106_220114	14/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.04	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.95	0.81	0.54	<0.01	0.27
SW106	1302_SW106_220315	15/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.66	0.54	0.34	0.01	0.2
SW106	1302_QC201_221123	23/11/2022	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.018	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.019	<0.01	<0.01	0.015	<0.02	<0.02	<0.02	<0.01	0.422	0.37	0.2	<0.01	0.17
SW106	1302_SW106_221123	23/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.03	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.59	0.47	0.28	<0.01	0.19
SW106	1302_QC101_221123	23/11/2022	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.03	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.64	0.52	0.32	<0.01	0.2
SW106	1302_SW106_230327	27/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	1.01	0.86	0.59	0.02	0.27
SW108	1302_SWRC08_170426	26/04/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	0.01	0.07	0.02	<0.05	0.03	0.02	<0.02	<0.02	<0.05	1.26	1.03	0.66	0.02	0.37
SW108	1302_SWRC08_20170629	29/06/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.06	0.01	<0.05	0.04	0.02	<0.02	<0.02	<0.05	1.12	0.91	0.58	0.02	0.33
SW108	1302_SW108_170726	26/07/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.06	<0.02	<0.05	0.04	0.02	<0.02	<0.02	<0.05	1.08	0.88	0.57	0.02	0.31
SW108	1302_SW108_171024	24/10/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.02	0.01	0.09	<0.02	<0.05	0.05	0.02	<0.02	<0.02	<0.05	1.54	1.27	0.89	0.03	0.38
SW108	1302_SW108_171114	14/11/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.03	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.63	0.51	0.25	0.02	0.26
SW108	1302_SW108_171205	5/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.77	0.68	0.42	<0.01	0.26
SW108	1302_SW108_180109	9/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.03	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.84	0.74	0.49	<0.01	0.25
SW108	1302_SW108_180308	8/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.05	0.03	0.01	<0.02	<0.02	<0.05	0.99	0.84	0.59	0.01	0.25
SW108	1302_SW108_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.04	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.75	0.64	0.42	<0.01	0.22
SW108	1302_SW108_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.05	0.01	<0.05	0.03	0.01	<0.02	<0.02	<0.05	0.83	0.68	0.43	0.01	0.25
SW108	1302_SW108_200121	21/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.61	0.54	0.37	<0.01	0.17
SW108	1302_SW108_200415	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.83	0.72	0.46	0.01	0.26
SW108	1302_SW108_201216	16/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.63	0.55	0.35	<0.01	0.2
SW108	1302_SW108_210428	28/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.8	0.67	0.4	0.01	0.27

Table T4
Current and Historical Surface Water Analytical Results
PFAS OMP - RAAF Base Darwin
Department of Defence

AECOM

				PFAS (Full Suite)																											
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTeDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																	
PFAS NEMP (2020) FW 99% Species Protection																															0.00023	19	
Human Health Receptors																																	
NHMRC (2019) PFAS Recreational Water																													2		10		
SW108	1302_SW108_220113	13/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.05	<0.02	0.05	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	1.04	0.87	0.57	0.01	0.3
SW108	1302_SW108_220315	15/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.64	0.54	0.35	0.01	0.19
SW108	1302_SW108_221123	23/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.71	0.57	0.36	0.01	0.21
SW108	1302_SW108_230327	27/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.97	0.83	0.57	0.02	0.26
SW109	1302_SWRC09_170426	26/04/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	0.01	0.08	0.01	<0.05	0.04	0.02	<0.02	<0.02	<0.05	1.41	1.16	0.78	0.03	0.38
SW109	1302_SWRC09_20170629	29/06/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.03	0.01	0.11	0.02	<0.05	0.06	0.03	<0.02	<0.02	<0.05	2.02	1.66	1.1	0.03	0.56
SW109	1302_SW109_170726	26/07/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.02	0.01	0.08	<0.02	<0.05	0.06	0.02	<0.02	<0.02	<0.05	1.57	1.3	0.84	0.02	0.46
SW109	1302_SW109_171024	24/10/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.1	<0.1	<0.02	<0.02	<0.02	0.04	0.03	0.2	<0.02	<0.05	0.1	0.06	<0.02	<0.02	<0.05	3.07	2.48	1.6	0.06	0.88
SW109	1302_SW109_171207	7/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.05	0.06	0.01	<0.02	<0.02	<0.05	1.18	0.98	0.63	0.02	0.35
SW109	1302_SW109_180109	9/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.04	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	1	0.88	0.59	0.01	0.29
SW109	1302_SW109_180215	15/02/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.7	0.62	0.47	0.01	0.15
SW109	1302_SW109_180222	22/02/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.05	0.02	0.01	<0.02	<0.02	<0.05	1.14	1.03	0.78	0.01	0.25
SW109	1302_SW109_180301	1/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.05	0.03	0.01	<0.02	<0.02	<0.05	0.86	0.73	0.54	0.01	0.19
SW109	1302_SW109_180308	8/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.05	0.03	0.01	<0.02	<0.02	<0.05	1.02	0.87	0.61	0.01	0.26
SW109	1302_SW109_180321	21/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.02	0.02	0.1	<0.02	<0.05	0.08	0.03	<0.02	<0.02	<0.05	1.51	1.17	0.82	0.04	0.35
SW109	1302_SW109_180329	29/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.06	0.01	<0.05	0.03	0.01	<0.02	<0.02	<0.05	1.01	0.83	0.55	0.02	0.28
SW109	1302_SW109_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.07	<0.02	<0.05	0.05	0.02	<0.02	<0.02	<0.05	1.5	1.27	0.81	0.02	0.46
SW109	1302_SW109_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.06	<0.02	<0.05	0.03	0.01	<0.02	<0.02	<0.05	0.96	0.8	0.51	0.01	0.29
SW109	1302_SW109_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.1	0.01	<0.05	0.03	0.03	<0.02	<0.02	<0.05	0.9	0.68	0.43	0.02	0.25
SW109	1302_SW109_191115	15/11/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.16	<0.02	<0.05	0.07	0.02	<0.02	<0.02	<0.05	1.74	1.37	0.71	0.03	0.66
SW109	1302_SW109_200121	21/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.61	0.54	0.35	<0.01	0.19
SW109	1302_SW109_200415	16/04/2020	Primary	0.32	0.25	0.26	0.24	0.68	0.28	0.68	0.57	0.31	0.74	0.3	1.2	0.26	0.27	0.27	0.29	0.27	0.34	0.26	0.27	0.28	0.26	0.76	0.24	0.26	11.3	1.16	0.64	0.25	0.52
SW109	1302_SW109_201216	16/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.53	0.49	0.31	<0.01	0.18
SW109	1302_SW109_210428	28/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.05	0.04	<0.02	<0.02	<0.02	<0.05	0.93	0.75	0.43	0.02	0.32
SW109	1302_SW109_220113	13/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.99	0.84	0.56	0.01	0.28
SW109	1302_SW109_220314	14/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.79	0.64	0.41	0.02	0.23
SW109	1302_SW109_220630	30/06/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.09	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	1.2	0.99	0.64	0.02	0.35
SW109	1302_SW109_220826	26/08/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.11	<0.02	<0.02	0.1	0.03	<0.05	<0.02	<0.02	2.15	1.77	1.03	0.04	0.74
SW109	1302_SW109_221123	23/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.08	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	1.12	0.91	0.58	0.02	0.33
SW109	1302_QC200_221222	22/12/2022	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.019	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.027	<0.01	<0.05	<0.01	<0.02	0.021	<0.02	<0.02	<0.02	<0.01	0.38	<0.01	0.21
SW109	1302_SW109_221222	22/12/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.05	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.83	0.71	0.46	0.01	0.25
SW109	1302_QC100_221222	22/12/2022	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.93	0.8	0.53	0.01	0.27
SW109	1302_SW109_230125	25/01/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	1.06	0.91	0.57	0.02	0.34
SW109	1302_SW109 _230221	23/02/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.41	0.36	0.26	0.02	0.1
SW109	1302_SW109_230327	27/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.98	0.84	0.58	0.02	0.26
SW109	1302_SW109_230414	14/04/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	0.93	0.78	0.52	0.02	0.26
SW112	1302_SWRC12_170426	26/04/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.03	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.52	0.43	0.26	0.01	0.17
SW112	1302_SW112_170726	26/07/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.09	0.09	0.04	<0.01	0.05
SW112	1302_SW112_171024	24/10/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.06	0.06	0.03	<0.01	0.03
SW112	1302_QC03SW_171024	24/10/2017	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.05	0.02	<0.01	0.03
SW112	1302_SW112_171116	16/11/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.03	0.01	<0.02	<0.02	<0.05	0.51	0.4	0.18	0.01	0.22
SW112	1302_SW112_171205	5/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.15	0.14	0.07	<0.01	0.07
SW112	1302_SW112_180109	9/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.13	0.13	0.08	<0.01	0.05
SW112	1302_SW112_180307	7/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.05	0.03	0.01	<0.02	<0.02	<0.05	1.07	0.91	0.66	0.02	0.25
SW112	1302_SW112_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.08	0.08	0.03	<0.01	0.05
SW112	1302_SW112_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.05	0.03	0.01	<0.02	<0.02	<0.05	0.92	0.78	0.5	0.01	0.28
SW112	1302_SW112_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	0.01	0.1	0.01	<0.05	0.03	0.03	<0.02	<0.02	<0.05	0.93	0.7	0.45	0.02	0.25
SW112	1302_SW112_200121	21/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.36	0.34	0.22	<0.01	0.12
SW112	1302_SW112_200415	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.82	0.7	0.43	0.01	0.27
SW112	1302_SW112_201216	16/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	1.15	0.96	0.63	0.02	0.33
SW112	1302_SW112_210428	28/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.09	0.09	0.04	<0.01	0.05
SW112	1302_SW112_220114	14/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.04	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.93	0.79	0.52	0.01	0.27
SW112	1302_SW112_220316	16/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.7	0.58	0.37	0.01	0.21
SW112	1302_SW112_221123	23/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.44	0.41	0.27	<0.01	0.14
SW112	1302_QC202_230328	28/03/2023	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.012	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.028	<0.01	<0.01	0.014	<0.02	<0.02	<0.02	<0.01	0.434	0.38	0.25	<0.01	0.13
SW112	1302_QC102_230328	28/03/2023	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	0.62	0.55	0.38	0.01	0.17
SW112	1302_SW112_230328	28/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	0.59	0.52	0.36	0.01	0.16
SW113	1302_SWRC13_170426	26/04/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW113	1302_SW113_170726	26/07/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01

Table T4
Current and Historical Surface Water Analytical Results
PFAS OMP - RAAF Base Darwin
Department of Defence

AECOM

				PFAS (Full Suite)																												
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTeDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																	
PFAS NEMP (2020) FW 99% Species Protection																															0.00023	19	
Human Health Receptors																																	
NHMRC (2019) PFAS Recreational Water																													2		10		
SW113	1302_SW113_171024	24/10/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW113	1302_SW113_171120	20/11/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.05	0.05	0.03	<0.01	0.02
SW113	1302_QC4SW_171120	20/11/2017	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.05	0.05	0.03	<0.01	0.02
SW113	1302_SW113_171205	5/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.08	0.08	0.05	<0.01	0.03
SW113	1302_SW113_180109	9/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.12	0.12	0.08	<0.01	0.04
SW113	1302_QCSW11_180109	9/01/2018	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.12	0.12	0.08	<0.01	0.04
SW113	1302_SW113_180307	7/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.61	0.54	0.38	<0.01	0.16
SW113	1302_SW113_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW113	1302_SW113_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	0.01	<0.02	<0.02	<0.02	<0.05	0.28	0.24	0.14	<0.01	0.1
SW113	1302_SW113_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.05	0.01	0.01	<0.02	<0.02	<0.05	0.31	0.24	0.14	<0.01	0.1
SW113	1302_SW113_191113	13/11/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.04	0.04	0.02	<0.01	0.02
SW113	1302_SW113_200122	22/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.13	0.13	0.08	<0.01	0.05
SW113	1302_SW113_200415	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.29	0.29	0.18	<0.01	0.11
SW113	1302_SW113_201216	16/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.24	0.22	0.13	<0.01	0.09
SW113	1302_SW113_210428	28/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW113	1302_SW113_220114	14/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.68	0.59	0.39	<0.01	0.2
SW113	1302_SW113_220316	16/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.37	0.34	0.22	<0.01	0.12
SW113	1302_SW113_221123	23/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.06	0.06	0.04	<0.01	0.02
SW113	1302_SW113_230328	28/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.27	0.27	0.19	<0.01	0.08
SW114	1302_SW114_171024	24/10/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.05	0.05	0.04	<0.01	0.01
SW114	1302_SW114_171205	5/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.03	0.01	0.09	<0.02	<0.05	0.05	0.02	<0.02	<0.02	<0.05	1.78	1.51	0.99	0.02	0.52
SW114	1302_SW114_180109	9/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.05	0.04	<0.02	<0.02	<0.02	<0.05	1.29	1.13	0.77	0.01	0.36
SW114	1302_QCSW08_180109	9/01/2018	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.05	0.04	<0.02	<0.02	<0.02	<0.05	1.26	1.11	0.77	0.01	0.34
SW114	1302_SW114_180308	8/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	<0.1	<0.02	<0.02	<0.02	0.11	0.04	0.39	<0.02	<0.05	0.21	0.08	<0.02	<0.02	<0.05	7.1	6	4.3	0.09	1.7
SW114	1302_SW114_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.05	0.03	0.01	<0.02	<0.02	<0.05	1.15	0.99	0.66	0.01	0.33
SW114	1302_SW114_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.04	0.02	0.17	<0.02	<0.05	0.06	0.04	<0.02	<0.02	<0.05	2.83	2.38	1.7	0.04	0.68
SW114	1302_SW114_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	0.07	<0.02	<0.02	<0.02	0.04	0.02	0.3	<0.02	<0.05	0.06	0.08	<0.02	<0.02	<0.05	2.69	2	1.4	0.05	0.6
SW114	1302_SW114_200121	21/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.17	0.17	0.09	<0.01	0.08
SW114	1302_SW114_200415	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.27	<0.02	<0.05	0.11	0.05	<0.02	<0.02	<0.05	3.74	3.03	2.08	0.06	0.95
SW114	1302_SW114_201216	16/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW114	1302_SW114_210428	28/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.2	<0.02	<0.05	0.04	0.03	<0.02	<0.02	<0.05	2.12	1.71	1.26	0.03	0.45
SW114	1302_SW114_220114	14/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.17	<0.1	<0.02	<0.02	<0.02	0.15	0.04	0.39	<0.02	<0.05	0.16	0.07	<0.02	<0.02	<0.05	5.83	4.79	3.24	0.06	1.55
SW114	1302_SW114_220314	14/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	<0.1	<0.02	<0.02	<0.02	0.1	0.04	0.48	<0.02	<0.05	0.2	0.1	<0.02	<0.02	<0.05	5.57	4.36	2.8	0.08	1.56
SW114	1302_SW114_221123	23/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
SW114	1302_SW114_230327	27/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.13	0.05	0.41	<0.02	<0.02	0.21	0.09	<0.05	<0.02	<0.02	6.51	5.37	3.79	0.09	1.58
SW115	1302_SW001_20170629	29/06/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.1	0.1	0.07	<0.01	0.03
SW115	1302_SW115_170726	26/07/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW115	1302_SW115_171205	5/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.1	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.21	<0.02	<0.05	0.11	0.05	<0.02	<0.02	<0.05	3.82	3.2	2.2	0.06	1
SW115	1302_QCSW06_171205	5/12/2017	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.21	<0.02	<0.05	0.11	0.06	<0.02	<0.02	<0.05	3.95	3.3	2.2	0.07	1.1
SW115	1302_SW115_180109	9/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.25	<0.02	<0.05	0.17	0.05	<0.02	<0.02	<0.05	5.49	4.7	3.3	0.06	1.4
SW115	1302_SW115_180308	8/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	<0.1	<0.02	<0.02	<0.02	0.07	0.02	0.16	<0.02	<0.05	0.14	0.04	<0.02	<0.02	<0.05	4.4	3.8	2.7	0.05	1.1
SW115	1302_SW115_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW115	1302_SW115_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.1	<0.1	<0.02	<0.02	<0.02	0.06	0.02	0.17	<0.02	<0.05	0.12	0.03	<0.02	<0.02	<0.05	3.24	2.67	1.7	0.04	0.97
SW115	1302_SW115_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	0.11	<0.02	<0.02	<0.02	0.05	0.02	0.42	<0.02	<0.05	0.1	0.09	<0.02	<0.02	<0.05	3.2	2.24	1.4	0.05	0.84
SW115	1302_SW115_200415	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.08	<0.02	<0.05	0.06	<0.02	<0.02	<0.02	<0.05	1.67	1.42	0.89	0.02	0.53
SW115	1302_SW115_201216	16/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW115	1302_SW115_210428	28/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.02	0.02	0.02	<0.01	<0.01
SW115	1302_SW115_220114	14/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.83	0.69	0.43	<0.01	0.26
SW115	1302_SW115_220314	14/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.1	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.14	<0.02	<0.05	0.09	<0.02	<0.02	<0.02	<0.05	2.05	1.65	0.94	0.03	0.71
SW115	1302_SW115_221123	23/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
SW115	1302_SW115_230327	27/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01*	<0.01	<0.01
SW120	1302_SWLC02_20170629	29/06/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.02	0.02	0.02	<0.01	<0.01
SW120	1302_SW120_170726	26/07/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.38	0.33	0.22	<0.01	0.11
SW120	1302_SW120_171024	24/10/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.02	0.01	<0.02	<0.02	<0.05	0.4	0.33	0.21	<0.01	0.12
SW120	1302_SW120_171206	6/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.05	0.01	<0.02	<0.02	<0.02	<0.05	0.3	0.28	0.2	<0.01	0.08
SW120	1302_SW120_180110	10/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.02	0.02	0.09	<0.02	<0.05	0.06	0.04	<0.02	<0.02	<0.05	1.77	1.46	0.97	0.03	0.49
SW120	1302_SW120_180130	30/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.03	0.01	0.1	<0.02	<0.05	0.09	0.03	<0.02	<0.02	<0.05	2.39	2.02	1.3	0.03	0.72
SW120	1302_SW120_180306	6/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.04	0.02	0.15	<0.02	<0.05	0.08	0.04	<0.02	<0.02	<0.05	2.69	2.25	1.5	0.04	0.75
SW120	1302_SW120_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	0.01	<0.02	<0.02	<0.02	<0.05	0.26	0.22	0.13	<0.01	0.09
SW120	1302_SW120_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.04	0.02	0.16	<0.02	<0.05	0.1	0.04	<0.02	<0.02	<0.05	2.32	1.83	0.99	0.03	0.84
SW120	1302_SW120_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	0.1	<0.02	<0.02	<0.02	0.04	0.03	0.67	<0.02	<0.05	0.08	0.12	<0.02	<0.02	<0.05	2.99	1.8	1	0.05	0.8
SW120	1302_SW120_191114	14/11/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.86	0.72	0.38	0.01	0.34

Table T4
Current and Historical Surface Water Analytical Results
PFAS OMP - RAAF Base Darwin
Department of Defence

AECOM

				PFAS (Full Suite)																											
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTeDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																	
PFAS NEMP (2020) FW 99% Species Protection																															0.00023	19	
Human Health Receptors																																	
NHMRC (2019) PFAS Recreational Water																													2		10		
SW120	1302_SW120_200121	21/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	0.69	0.58	0.34	0.01	0.24
SW120	1302_SW120_200415	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.04	<0.02	0.13	<0.02	<0.05	0.07	<0.02	<0.02	<0.02	<0.05	2.09	1.76	1.11	0.03	0.65
SW120	1302_SW120_201216	16/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.66	0.58	0.35	<0.01	0.23
SW120	1302_SW120_210428	28/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.04	0.04	0.02	<0.01	0.02
SW120	1302_SW120_220114	14/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.06	<0.02	0.09	<0.02	<0.05	0.05	<0.02	<0.02	<0.02	<0.05	1.7	1.43	0.91	0.02	0.52
SW120	1302_SW120_220315	15/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.04	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.08	<0.02	<0.05	0.03	<0.02	<0.02	<0.02	<0.05	1.05	0.88	0.54	0.02	0.34
SW120	1302_SW120_221123	23/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.06	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	1.03	0.86	0.58	0.02	0.28
SW120	1302_SW120_230328	28/03/2023	Primary	<0.05	<0.05	0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	0.02	<0.05	<0.02	<0.02	0.65	0.53	0.39	0.01	0.14
SW124	1302_SWLC05_170425	25/04/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW124	1302_SWLC05_20170629	29/06/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.02	0.02	0.02	<0.01	<0.01
SW124	1302_SW124_170726	26/07/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW124	1302_SW124_171024	24/10/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW124	1302_SW124_171208	8/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.05	0.05	0.04	<0.01	0.01
SW124	1302_SW124_180130	30/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.04	0.04	0.04	<0.01	<0.01
SW124	1302_SW124_180306	6/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW124	1302_SW124_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW124	1302_SW124_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.06	0.06	0.03	<0.01	0.03
SW124	1302_SW124_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.09	0.07	0.04	<0.01	0.03
SW124	1302_SW124_191112	12/11/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.03	0.03	0.03	<0.01	<0.01
SW124	1302_SW124_200122	22/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.09	0.09	0.06	<0.01	0.03
SW124	1302_SW124_200415	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.02	0.02	0.02	<0.01	<0.01
SW124	1302_SW124_201216	16/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.09	0.09	0.06	<0.01	0.03
SW124	1302_SW124_210428	28/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW124	1302_SW124_220114	14/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	0.05	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.83	0.76	0.59	<0.01	0.17
SW124	1302_SW124_220316	16/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.09	0.09	0.06	<0.01	0.03
SW124	1302_SW124_221123	23/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.06	0.06	0.05	<0.01	0.01
SW124	1302_SW124_230328	28/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.1	0.1	0.08	<0.01	0.02
SW125	1302_SW125_171206	6/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	<0.1	<0.02	<0.02	<0.02	0.08	0.03	0.21	<0.02	<0.05	0.17	0.05	<0.02	<0.02	<0.05	4.82	4.1	2.7	0.06	1.4
SW125	1302_SW125_180110	10/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	<0.1	<0.02	<0.02	<0.02	0.09	0.04	0.26	<0.02	<0.05	0.2	0.07	<0.02	<0.02	<0.05	6.28	5.4	3.8	0.07	1.6
SW125	1302_SW125_180216	16/02/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	<0.1	<0.02	<0.02	<0.02	0.09	0.05	0.33	<0.02	<0.05	0.16	0.09	<0.02	<0.02	<0.05	6.89	5.9	4.3	0.09	1.6
SW125	1302_SW125_180222	22/02/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.7	0.63	0.43	<0.01	0.2
SW125	1302_SW125_180301	1/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.29	0.06	<0.02	<0.02	<0.02	0.13	0.07	0.55	<0.02	<0.05	0.32	0.12	<0.02	<0.02	<0.05	9.06	7.4	5.1	0.12	2.3
SW125	1302_SW125_180307	7/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.38	0.09	<0.02	<0.02	<0.02	0.23	0.11	0.82	<0.02	<0.05	0.45	0.19	<0.02	<0.02	<0.05	12.66	10.2	6.6	0.19	3.6
SW125	1302_SW125_180321	21/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.24	0.06	<0.02	<0.02	<0.02	0.13	0.07	0.49	<0.02	<0.05	0.39	0.14	<0.02	<0.02	<0.05	9.04	7.4	5.2	0.12	2.2
SW125	1302_SW125_180329	29/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.2	<0.1	<0.02	<0.02	<0.02	0.12	0.06	0.47	<0.02	<0.05	0.23	0.12	<0.02	<0.02	<0.05	7.52	6.2	3.9	0.12	2.3
SW125	1302_SW125_180412	12/04/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.2	0.06	<0.02	<0.02	<0.02	0.19	0.07	0.45	<0.02	<0.05	0.28	0.1	<0.02	<0.02	<0.05	8.36	6.9	4	0.11	2.9
SW125	1302_SW125_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.11	0.05	0.29	<0.02	<0.05	0.22	0.08	<0.02	<0.02	<0.05	7	6	4.1	0.09	1.9
SW125	1302_SW125_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.08	0.04	0.31	<0.02	<0.05	0.25	0.05	<0.02	<0.02	<0.05	5.93	4.9	3.2	0.1	1.7
SW125	1302_SW125_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	0.24	<0.02	<0.02	<0.02	0.12	0.06	1.6	<0.02	<0.05	0.16	0.27	<0.02	<0.02	<0.05	7.47	4.7	3	0.12	1.7
SW125	1302_SW125_200121	21/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.12	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.22	<0.02	<0.05	0.14	0.06	<0.02	<0.02	<0.05	3.51	2.83	1.68	0.05	1.15
SW125	1302_SW125_200415	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.14	<0.1	<0.02	<0.02	<0.02	0.1	0.03	0.26	<0.02	<0.05	0.16	0.06	<0.02	<0.02	<0.05	5.07	4.25	2.76	0.07	1.49
SW125	1302_SW125_201216	16/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	0.03	<0.02	<0.02	0.08	0.03	0.22	<0.02	<0.05	0.15	0.06	<0.02	<0.02	<0.05	4.95	4.21	2.82	0.06	1.39
SW125	1302_SW125_220114	14/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	<0.1	<0.02	<0.02	<0.02	0.09	0.04	0.26	<0.02	<0.05	0.15	0.05	<0.02	<0.02	<0.05	4.67	3.87	2.41	0.06	1.46
SW125	1302_SW125_220315	15/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.16	<0.1	<0.02	<0.02	<0.02	0.09	0.04	0.31	<0.02	<0.05	0.14	0.07	<0.02	<0.02	<0.05	5.25	4.36	2.88	0.08	1.48
SW125	1302_QC200_221123	23/11/2022	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.064	<0.05	<0.01	<0.01	<0.01	0.037	0.019	0.13	<0.01	<0.01	0.074	0.035	<0.02	<0.02	<0.01	2.516	2.12	1.2	0.037	0.92
SW125	1302_SW125_221123	23/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.17	<0.02	<0.02	0.11	0.05	<0.05	<0.02	<0.02	3.58	3.02	1.95	0.06	1.07
SW125	1302_QC100_221123	23/11/2022	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.1	<0.1	<0.02	<0.02	<0.02	0.07	0.03	0.2	<0.02	<0.02	0.12	0.06	<0.05	<0.02	<0.02	4.09	3.45	2.27	0.06	1.18
SW125	1302_SW125_230328	28/03/2023	Primary	<0.05	<0.05	1.04	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.13	<0.1	<0.02	<0.02	<0.02	0.1	0.09	0.47	<0.02	<0.02	0.18	0.3	<0.05	<0.02	<0.02	7.03	4.6	2.98	0.12	1.62
SW132	1302_SWRCC02_170426	26/04/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	0.01	<0.02	<0.02	<0.02	<0.05	0.39	0.39	0.25	<0.01	0.14
SW132	1302_SWRCC02_20170629	29/06/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.09	0.09	0.06	<0.01	0.03
SW132	1302_SW132_170726	26/07/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.08	0.08	0.05	<0.01	0.03
SW132	1302_SW132_171024	24/10/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.04	<0.02	<0.02	<0.05	0.07	0.03	0.03	<0.01	<0.01
SW132	1302_SW132_171116	16/11/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.04	0.04	0.02	<0.01	0.02
SW132	1302_SW132_171208	8/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.08	0.08	0.06	<0.01	0.02
SW132	1302_SW132_180110	10/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.09	0.09	0.06	<0.01	0.03
SW132	1302_SW132_180307	7/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.29	0.28	0.2	<0.01	0.08
SW132	1302_SW132_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.1	0.1	0.06	<0.01	0.04
SW132	1302_SW132_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.13	0.13	0.08	<0.01	0.05
SW132	1302_QCSW01_190319	19/03/2019	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.11	0.11	0.07	<0.01	0.04
SW132	1302_SW132_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.14	0.12	0.07	<0.01	0.05

Table T4
Current and Historical Surface Water Analytical Results
PFAS OMP - RAAF Base Darwin
Department of Defence

AECOM

				PFAS (Full Suite)																												
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTeDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																
PFAS NEMP (2020) FW 99% Species Protection																															0.00023	19	
Human Health Receptors																																
NHMRC (2019) PFAS Recreational Water																													2		10	
SW132	1302_SW132_200416	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.21	0.21	0.13	<0.01	0.08
SW132	1302_SW132_201217	17/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.11	0.11	0.07	<0.01	0.04
SW132	1302_SW132_210428	28/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.16	0.16	0.09	<0.01	0.07
SW132	1302_SW132_220114	14/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.18	0.18	0.12	<0.01	0.06
SW132	1302_SW132_220315	15/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.2	0.2	0.13	<0.01	0.07
SW132	1302_QC200_221124	24/11/2022	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	0.075	0.075	0.049	<0.01	0.026
SW132	1302_SW132_221124	24/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.1	0.1	0.07	<0.01	0.03
SW132	1302_QC100_221124	24/11/2022	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.1	0.1	0.07	<0.01	0.03
SW132	1302_QC200_230327	27/03/2023	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	0.216	0.22	0.14	<0.01	0.076
SW132	1302_SW132_230327	27/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.3	0.3	0.2	<0.01	0.1
SW132	1302_QC100_230327	27/03/2023	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.32	0.32	0.23	<0.01	0.09
SW133	1302_SWRCC01_170426	26/04/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	0.03	0.05	<0.02	<0.05	<0.02	0.08	<0.02	<0.02	<0.05	0.33	0.15	0.08	0.02	0.07
SW133	1302_SWRCC01_20170629	29/06/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.02	0.03	<0.02	<0.02	<0.05	0.44	0.34	0.22	0.01	0.12
SW133	1302_SW133_170726	26/07/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	0.01	0.04	0.02	<0.05	0.02	0.03	<0.02	<0.02	<0.05	0.4	0.26	0.13	0.01	0.13
SW133	1302_SW133_171024	24/10/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.01	0.05	<0.02	<0.02	<0.05	0.21	0.12	0.07	<0.01	0.05
SW133	1302_SW133_171208	8/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	0.03	0.05	<0.02	<0.05	0.03	0.08	<0.02	<0.02	<0.05	0.45	0.24	0.13	0.01	0.11
SW133	1302_SW133_180111	11/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	0.04	0.07	<0.02	<0.05	0.01	0.13	<0.02	<0.02	<0.05	0.47	0.21	0.11	0.01	0.1
SW133	1302_SW133_180307	7/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	0.03	0.04	<0.02	<0.05	<0.02	0.07	<0.02	<0.02	<0.05	0.3	0.15	0.09	0.01	0.06
SW133	1302_SW133_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	0.02	0.04	<0.02	<0.05	0.02	0.06	<0.02	<0.02	<0.05	0.42	0.26	0.13	0.01	0.13
SW133	1302_SW133_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.15	<0.1	<0.02	<0.02	<0.02	0.1	0.04	0.33	<0.02	<0.05	0.27	0.06	<0.02	<0.02	<0.05	6.51	5.4	3.5	0.1	1.9
SW133	1302_SW133_200123	23/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	0.04	<0.02	<0.02	<0.05	0.15	0.09	0.04	<0.01	0.05
SW133	1302_SW133_200416	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	0.04	<0.02	<0.02	<0.05	0.2	0.13	0.06	<0.01	0.07
SW133	1302_SW133_201217	17/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	0.02	0.04	<0.02	<0.05	<0.02	0.05	<0.02	<0.02	<0.05	0.22	0.1	0.05	0.01	0.05
SW133	1302_SW133_210428	28/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW133	1302_SW133_220114	14/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	0.04	<0.02	<0.02	<0.05	0.21	0.13	0.06	<0.01	0.07
SW133	1302_SW133_220315	15/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	0.04	<0.02	<0.02	<0.05	0.19	0.11	0.05	0.01	0.06
SW133	1302_SW133_221124	24/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	0.03	<0.05	<0.02	<0.02	0.14	0.09	0.04	<0.01	0.05
SW133	1302_SW133_230327	27/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	0.02	0.03	<0.02	<0.02	<0.02	0.05	<0.05	<0.02	<0.02	0.25	0.14	0.08	0.01	0.06
SW143	1302_SW143_170726	26/07/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.02	<0.02	<0.02	<0.05	0.09	0.07	0.05	<0.01	0.02
SW143	1302_SW143_170907	8/09/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW143	1302_SW143_171024	24/10/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.02	0.02	0.02	<0.01	<0.01
SW143	1302_SW143_171117	17/11/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.05	<0.02	0.02	<0.02	<0.02	<0.05	0.07	0.04	0.02	<0.01	0.02
SW143	1302_QC5SW_171117	17/11/2017	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.05	<0.02	0.02	<0.02	<0.02	<0.05	<0.02	0.04	0.02	<0.01	0.02
SW143	1302_SW143_171208	8/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.01	<0.05	<0.02	0.04	<0.02	<0.02	<0.05	0.22	0.14	0.11	0.01	0.03
SW143	1302_SW143_180111	11/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	0.02	0.03	0.01	<0.05	<0.02	0.05	<0.02	<0.02	<0.05	0.28	0.16	0.11	0.01	0.05
SW143	1302_SW143_180216	16/02/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.15	0.15	0.1	<0.01	0.05
SW143	1302_SW143_180222	22/02/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW143	1302_SW143_180301	1/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	0.01	<0.05	<0.02	0.02	<0.02	<0.02	<0.05	0.15	0.11	0.08	<0.01	0.03
SW143	1302_SW143_180307	7/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.11	0.11	0.07	<0.01	0.04
SW143	1302_SW143_180321	21/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.05	<0.02	0.02	<0.02	<0.02	<0.05	0.14	0.11	0.07	<0.01	0.04
SW143	1302_SW143_180329	29/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	0.06	<0.02	<0.02	<0.02	0.13	0.07	0.52	<0.02	<0.05	0.25	0.14	<0.02	<0.02	<0.05	8.22	6.7	4.1	0.13	2.6
SW143	1302_SW143_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.05	<0.02	0.02	<0.02	<0.02	<0.05	0.09	0.06	0.04	<0.01	0.02
SW143	1302_SW143_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.01	<0.05	<0.02	0.02	<0.02	<0.02	<0.05	0.2	0.15	0.11	<0.01	0.04
SW143	1302_SW143_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	0.08	<0.02	<0.02	<0.02	<0.02	0.05	0.08	0.02	<0.05	<0.02	0.18	<0.02	<0.02	<0.05	0.61	0.17	0.13	0.03	0.04
SW143	1302_SW143_200416	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	0.03	<0.05	<0.02	0.04	<0.02	<0.02	<0.05	0.25	0.12	0.07	0.02	0.05
SW143	1302_SW143_201217	17/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.4	0.37	0.23	<0.01	0.14
SW143	1302_SW143_210428	28/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW143	1302_SW143_220114	14/01/2022	Primary	<0.05	<0.05	0.12	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	0.02	0.06	<0.02	<0.05	<0.02	0.06	<0.02	<0.02	<0.05	0.52	0.25	0.16	0.01	0.09
SW143	1302_SW143_220316	16/03/2022	Primary	<0.05	<0.05	0.08	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	0.02	<0.05	<0.02	0.04	<0.02	<0.02	<0.05	0.4	0.2	0.14	0.02	0.06
SW143	1302_SW143_221124	24/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.05	0.05	0.03	<0.01	0.02
SW143	1302_SW143_230328	28/03/2023	Primary	<0.05	<0.05	0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	0.03	<0.05	<0.02	<0.02	0.33	0.2	0.14	0.02	0.06
SW152	1302_SW152_230328	28/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.29	0.29	0.23	<0.01	0.06
SW152*	1302_SW152_220117	17/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.22	0.22	0.18	<0.01	0.04
SW152*	1302_SW152_220314	14/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.22	0.22	0.16	<0.01	0.06
SW156	1302_SW156_180129	29/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.01	0.01	0.01	<0.01	<0.01
SW156	1302_SW156_180314	14/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.05	<0.02	<0.05	0.04	0.01	<0.02	<0.02	<0.05	0.86	0.72	0.38	<0.01	0.34
SW156	1302_SW156_181213	13/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.08	0.08	0.08	<0.01	<0.01
SW156	1302_SW156_200123	21/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.04	0.04	0.04	<0.01	<0.01
SW156	1302_SW156_220117	17/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.17	0.13	0.1	0.02	0.03
SW156	1302_SW156_221123	23/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.05	0.05	0.05	<0.01	<0.01
SW156	1302_SW156_230328	28/03/2023	Primary	<0.05	<0.05	<0.05	0.08	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.21	0.1	<0.02	0.03	<0.02	0.04	0.44	0.02	<0.02	0.05	0.24	<0.05	<0.02	<0.02	<0.05	1.91	0.66	0.56	0.04	0.1
SW160	1302_SW160_180129	29/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.12	0.12	0.07	<0.01	0.05
SW160	1302_SW160_180305	5/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.06	0.03	0.21	<0.02	<0.05	0.1	0.05	<0.02	<0.02	<0.05	3.92	3.33	2.6	0.05	0.73
SW160	1302_SW160_190325	25/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.33	0.32	0.26	<0.01	0.06

Table T4
Current and Historical Surface Water Analytical Results
PFAS OMP - RAAF Base Darwin
Department of Defence

AECOM

				PFAS (Full Suite)																												
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTeDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																
PFAS NEMP (2020) FW 99% Species Protection																															0.00023	19	
Human Health Receptors																																
NHMRC (2019) PFAS Recreational Water																													2		10	
SW160	1302_SW160_200122	22/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.02	0.02	0.02	<0.01	<0.01
SW160	1302_SW160_220117	17/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.14	0.12	0.09	<0.01	0.03
SW160	1302_SW160_221125	25/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.31	0.31	0.26	<0.01	0.05
SW160	1302_SW160_230328	28/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.1	0.1	0.09	<0.01	0.01
SW162	1302_QCSW8_171025	24/10/2017	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.02	<0.02	<0.02	<0.05	0.04	0.04	0.04	<0.01	<0.01
SW162	1302_SW162_171025	25/10/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.03	0.03	0.03	<0.01	<0.01
SW162	1302_SW162_180108	8/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.05	0.05	0.05	<0.01	<0.01
SW162	1302_QCSW05_180108	8/01/2018	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.05	0.05	<0.01	<0.01
SW162	1302_SW162_180215	15/02/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW162	1302_SW162_180222	22/02/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	0.02	<0.02	<0.02	<0.02	<0.05	0.74	0.67	0.47	<0.01	0.2
SW162	1302_SW162_180301	1/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW162	1302_SW162_180305	5/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW162	1302_SW162_190322	22/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.01	0.01	0.01	<0.01	<0.01
SW162	1302_QCSW08_190322	22/03/2019	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.01	0.01	<0.01	<0.01
SW162	QCSW09_190322	22/03/2019	Interlab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW162	1302_SW162_200121	21/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.03	0.03	0.03	<0.01	<0.01
SW162	1302_SW162_200414	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.11	0.11	0.08	<0.01	0.03
SW162	1302_SW162_201218	18/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.05	0.05	0.05	<0.01	<0.01
SW162	1302_SW162_210121	20/01/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.04	0.04	0.04	<0.01	<0.01
SW162	1302_SW162_210429	29/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.02	0.02	0.02	<0.01	<0.01
SW162	1302_SW162_220113	13/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.02	0.02	0.02	<0.01	<0.01
SW162	1302_SW162_220314	14/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.01	0.01	0.01	<0.01	<0.01
SW162	1302_SW162_221125	25/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.06	0.06	0.05	<0.01	0.01
SW162	1302_SW162_230328	28/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.02	<0.02	0.01	0.01	0.01	<0.01	<0.01
SW168	1302_SW002_20170629	29/06/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.1	<0.1	<0.02	<0.02	<0.02	0.04	0.02	0.14	<0.02	<0.05	0.09	0.03	<0.02	<0.02	<0.05	3.07	2.6	1.6	0.05	1
SW168	1302_SW168_170726	26/07/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.1	<0.1	<0.02	<0.02	<0.02	0.05	0.03	0.18	<0.02	<0.05	0.12	0.06	<0.02	<0.02	<0.05	2.95	2.36	1.5	0.05	0.86
SW168	1302_SW168_171024	24/10/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	0.06	<0.02	<0.02	<0.02	0.03	0.04	0.22	<0.02	<0.05	0.07	0.09	<0.02	<0.02	<0.05	2.82	2.16	1.5	0.08	0.66
SW168	1302_SW168_171207	7/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.05	0.02	0.12	<0.02	<0.05	0.13	0.03	<0.02	<0.02	<0.05	3.01	2.53	1.7	0.04	0.83
SW168	1302_SW168_180109	9/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.03	0.02	0.13	<0.02	<0.05	0.07	0.03	<0.02	<0.02	<0.05	2.29	1.9	1.3	0.05	0.6
SW168	1302_SW168_180215	15/02/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.03	0.03	0.16	<0.02	<0.05	0.08	0.05	<0.02	<0.02	<0.05	2.63	2.12	1.5	0.07	0.62
SW168	1302_SW168_180222	22/02/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.04	<0.02	<0.05	0.02	0.01	<0.02	<0.02	<0.05	1.34	1.24	1	0.01	0.24
SW168	1302_SW168_180301	1/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.03	0.03	0.15	<0.02	<0.05	0.09	0.04	<0.02	<0.02	<0.05	2.33	1.85	1.3	0.06	0.55
SW168	1302_SW168_180308	8/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.03	0.03	0.12	<0.02	<0.05	0.07	0.03	<0.02	<0.02	<0.05	1.76	1.36	0.93	0.05	0.43
SW168	1302_SW168_180321	21/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.02	0.02	0.1	<0.02	<0.05	0.08	0.03	<0.02	<0.02	<0.05	1.51	1.17	0.82	0.04	0.35
SW168	1302_SW168_180329	29/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.02	0.02	0.09	<0.02	<0.05	0.05	0.02	<0.02	<0.02	<0.05	1.4	1.11	0.7	0.04	0.41
SW168	1302_SW168_181211	11/12/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.1	<0.1	<0.02	<0.02	<0.02	0.05	0.02	0.15	<0.02	<0.05	0.12	0.03	<0.02	<0.02	<0.05	3.62	3.1	2.1	0.05	1
SW168	1302_SW168_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.02	0.02	0.08	<0.02	<0.05	0.05	0.02	<0.02	<0.02	<0.05	1.43	1.15	0.7	0.03	0.45
SW168	1302_SW168_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	0.06	<0.02	<0.02	<0.02	0.02	0.03	0.17	<0.02	<0.05	0.05	0.06	<0.02	0.01	<0.05	1.56	1.05	0.66	0.05	0.39
SW168	1302_SW168_200121	21/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.09	<0.02	<0.05	0.06	0.02	<0.02	<0.02	<0.05	1.41	1.14	0.69	0.02	0.45
SW168	1302_SW168_200415	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.12	<0.02	<0.05	0.08	0.02	<0.02	<0.02	<0.05	1.65	1.28	0.71	0.04	0.57
SW168	1302_SW168_201216	16/12/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.34	0.34	0.27	<0.01	0.07
SW168	1302_SW168_210428	28/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.07	<0.1	<0.02	<0.02	<0.02	0.03	0.03	0.23	<0.02	<0.05	0.08	0.05	<0.02	<0.02	<0.05	1.87	1.33	0.72	0.05	0.61
SW168	1302_SW168_220113	13/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.05	<0.02	0.11	<0.02	<0.05	0.06	<0.02	<0.02	<0.02	<0.05	1.63	1.32	0.9	0.03	0.42
SW168	1302_SW168_220315	15/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	<0.02	0.02	0.12	<0.02	<0.05	0.04	0.03	<0.02	<0.02	<0.05	1.07	0.77	0.47	0.04	0.3
SW168	1302_QC101_220315	15/03/2022	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.11	<0.02	<0.05	0.05	0.03	<0.02	<0.02	<0.05	1.04	0.76	0.46	0.04	0.3
SW168	1302_SW168_221123	23/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.08	<0.1	<0.02	<0.02	<0.02	0.09	0.02	0.17	<0.02	<0.02	0.08	<0.02	<0.05	<0.02	<0.05	2.3	1.82	1.2	0.04	0.62
SW168	1302_SW168_230327	27/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.05	<0.1	<0.02	<0.02	<0.02	0.02	0.03	0.1	<0.02	<0.02	0.06	0.03	<0.05	<0.02	<0.02	1.36	1.03	0.67	0.04	0.36
SW170	1302_SW170_171025	25/10/2017	Primary	<0.05	<0.05	0.07	0.01	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.6	0.52	0.48	<0.01	0.04
SW170	1302_QCSW02_171204	4/12/2017	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.18	0.18	0.16	<0.01	0.02
SW170	1302_SW170_171204	4/12/2017	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.18	0.18	0.16	<0.01	0.02
SW170	1302_SW170_180108	8/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.25	0.25	0.23	<0.01	0.02
SW170	1302_SW170_180215	15/02/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.11	<0.1	<0.02	<0.02	<0.02	0.07	0.02	0.21	<0.02	<0.05	0.1	0.05	<0.02	<0.02	<0.05	5.31	4.7	3.6	0.05	1.1
SW170	1302_SW170_180222	22/02/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.04	<0.02	<0.05	0.02	0.01	<0.02	<0.02	<0.05	1.63	1.52	1.3	0.01	0.22
SW170	1302_SW170_180301	1/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.01	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	0.01	0.01	<0.02	<0.02	<0.05	0.54	0.49	0.4	<0.01	0.09
SW170	1302_SW170_180305	5/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	0.01	0.07	<0.02	<0.05	0.03	0.02	<0.02	<0.02	<0.05	2.19	1.98	1.6	0.03	0.38
SW170	1302_SW170_180321	21/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.05	0.04	0.02	<0.02	<0.02	<0.05	1.75	1.58	1.3	0.02	0.28
SW170	1302_SW170_180329	29/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	0.01	<0.02	0.03	<0.02	<0.05	0.01	<0.02	<0.02	<0.02	<0.05	1.13	1.07	0.9	0.01	0.17
SW170	1302_SW170_190319	19/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.37	0.36	0.3	<0.01	0.06
SW170	1302_SW170_200121	21/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.12	0.12	0.12	<0.01	<0.01
SW170	1302_SW170_200414	16/04/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.26	0.26	0.19	<0.01	0.07
SW170	1302_SW170_210120	20/01/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.33	0.33	0.24	<0.01	0.09
SW170	1302_SW170_210429	29/04/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.26	0.23	0.17	<0.01	0.06
SW170	1302_SW170_220113	13/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.59	0.57	0.42	<0.01	0.15
SW170	1302_SW170_220314	14/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.52	0.48	0.33	<0.01	0.15
SW170	1302_QC100_220314	14/03/2022	Intralab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.53	0.49	0.34	<0.01	0.15
SW170	1302_QC200_220314	14/03/2022	Interlab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.52	0.48	0.34	<0.01	0.14
SW170	1302_SW170_221124	24/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.02	<0.02	0.9	0.9	0.85	<0.01	0.05

Table T4
Current and Historical Surface Water Analytical Results
PFAS OMP - RAAF Base Darwin
Department of Defence

AECOM

				PFAS (Full Suite)																												
				10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MeFOSAA	MeFOSE	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTeDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFHxS and PFOS	PFOS	PFOA	PFHxS
				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
LOR				0.05	0.05	0.05	0.05	0.05	0.02	0.05	0.05	0.02	0.05	0.02	0.1	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.01	0.01	0.01
Ecological Receptors																																	
PFAS NEMP (2020) FW 99% Species Protection																															0.00023	19	
Human Health Receptors																																	
NHMRC (2019) PFAS Recreational Water																													2		10		
SW170	1302_SW170_221222	22/12/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.34	0.34	0.3	<0.01	0.04
SW170	1302_SW170_230125	25/01/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.5	0.48	0.36	<0.01	0.12
SW170	1302_SW170_ 230221	21/02/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.12	0.12	0.09	<0.01	0.03
SW170	1302_SW170_230328	28/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.35	0.35	0.29	<0.01	0.06
SW170	1302_QC100_230414	14/04/2023	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.2	0.2	0.17	<0.01	0.03
SW170	1302_QC200_230414	14/04/2023	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.18	0.18	0.092	<0.01	0.016
SW170	1302_SW170_230414	14/04/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.19	0.19	0.16	<0.01	0.03
SW178	1302_SW178_180305	5/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW178	1302_SW178_190322	22/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	0.04	0.04	<0.01	<0.01
SW178	1302_SW178_210120	21/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.02	0.02	0.02	<0.01	<0.01
SW178	1302_SW178_210120	20/01/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.01	0.01	0.01	<0.01	<0.01
SW178	1302_SW178_220117	17/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.38	0.38	0.34	<0.01	0.04
SW178	1302_SW178_220314	14/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW178	1302_SW178_221125	25/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.09	0.09	0.09	<0.01	<0.01
SW178	1302_QC201_230328	28/03/2023	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	<0.01	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	0.026	0.026	0.026	<0.01	<0.01
SW178	1302_SW178_230328	28/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.04	0.04	0.04	<0.01	<0.01
SW178	1302_QC101_230328	28/03/2023	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.04	0.04	0.04	<0.01	<0.01
SW181	1302_SW181_180129	29/01/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01
SW181	1302_SW181_180312	12/03/2018	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.67	0.64	0.57	<0.01	0.07
SW181	1302_SW181_190322	22/03/2019	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	0.01	<0.02	<0.02	<0.05	0.37	0.31	0.25	<0.01	0.06
SW181	1302_SW181_200121	21/01/2020	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.15	0.15	0.15	<0.01	<0.01
SW181	1302_SW181_201218	18/12/2020	Primary	<0.05	<0.05	0.09	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.47	0.38	0.35	<0.01	0.03
SW181	1302_SW181_210120	20/01/2021	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.19	0.19	0.19	<0.01	<0.01
SW181	1302_SW181_220117	17/01/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.23	0.23	0.18	<0.01	0.05
SW181	1302_SW181_220314	14/03/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.32	0.29	0.23	<0.01	0.06
SW181	1302_SW181_221125	25/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	0.03	0.03	0.03	<0.01	<0.01
SW181	1302_SW181_230328	28/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	<0.02	0.03	<0.05	<0.02	<0.02	1.16	1.04	0.96	<0.01	0.08
SW300	1302_SW300_221125	25/11/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.01	<0.01	<0.01*	<0.01	<0.01
SW300	1302_QC200_230125	25/01/2023	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.19	0.16	<0.01	<0.01	<0.01	<0.01	0.22	0.36	0.022	<0.01	0.14	0.22	<0.02	<0.02	<0.01	2.152	0.62	0.62	0.22	<0.01
SW300	1302_QC100_230125	25/01/2023	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.2	0.2	<0.02	<0.02	<0.02	0.04	0.25	0.41	0.03	<0.02	0.18	0.3	<0.05	<0.02	<0.02	3.59	1.72	0.77	0.26	0.95
SW300	1302_SW300_230125	25/01/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.22	0.2	<0.02	<0.02	<0.02	0.04	0.25	0.42	0.02	<0.02	0.18	0.29	<0.05	<0.02	<0.02	3.51	1.64	0.71	0.25	0.93
SW300	1302_QC200_230221	21/02/2023	Inter-lab Duplicate	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.05	0.012	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	0.026	<0.01	<0.01	0.014	<0.02	<0.02	<0.02	<0.01	0.376	0.314	0.22	0.01	0.094
SW300	1302_SW300_230221	21/02/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	0.02	0.05	<0.02	<0.02	<0.02	0.03	<0.05	<0.02	<0.02	0.36	0.24	0.15	0.02	0.09
SW300	1302_QC100_230221	21/02/2023	Intra-lab Duplicate	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.42	0.37	0.26	0.02	0.11
SW300	1302_SW300_230327	27/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.23	0.2	<0.02	<0.02	<0.02	0.05	0.35	0.66	0.03	<0.02	0.22	0.34	<0.05	<0.02	<0.02	4.57	2.14	1.11	0.35	1.03
SW300	1302_SW300_230414	14/04/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.18	0.2	<0.02	<0.02	<0.02	0.05	0.36	0.62	0.04	<0.02	0.17	0.35	<0.05	<0.02	<0.02	4.53	2.2	1.24	0.36	0.96
SW312	1302_SW312_221222	22/12/2022	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	0.73	0.73	0.65	<0.01	0.08
SW312	1302_SW312_230125	25/01/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.03	<0.1	<0.02	<0.02	<0.02	0.02	<0.02	0.08	<0.02	<0.02	0.03	<0.02	<0.05	<0.02	<0.02	1.98	1.8	1.58	0.02	0.22
SW312	1302_SW312_ 230221	21/02/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.09	<0.1	<0.02	<0.02	<0.02	0.06	<0.02	0.22	<0.02	<0.02	0.08	0.06	<0.05	<0.02	<0.02	2.78	2.23	1.71	0.04	0.52
SW312	1302_SW312_230328	28/03/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.19	<0.1	<0.02	<0.02	<0.02	0.09	0.03	0.46	<0.02	<0.02	0.17	0.11	<0.05	<0.02	<0.02	3.63	2.52	1.63	0.06	0.89
SW312	1302_SW312_230414	14/04/2023	Primary	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.05	<0.05	<0.02	<0.05	0.06	<0.1	<0.02	<0.02	<0.02	0.03	<0.02	0.13	<0.02	<0.02	0.06	0.02	<0.05	<0.02	<0.02	2.48	2.14	1.63	0.04	0.51

Notes:
µg/L: micrograms per litre
ND: non-detect
*SW152 is compareable location for SW101 that is no longer accessible

Table T5
Current and Historical Biota Analytical Results
PFAS OMP - RAAF Base Darwin
Department of Defence

							PFAS Full Suite																													
							10:2 FTS	**4:2 FTS**	**6:2 FTS**	**8:2 FTS**	**ErFOSA**	**EtFOSAA**	**EdFOSE**	**MeFOSA**	**MFOSA**	**MeFOSA**	**PFBS**	**PFBA**	**PFDS**	**PFDA**	**PFDoDA**	**PFHpS**	**PFHpA**	**PFHxA**	**PFNA**	**FOSA**	**PFPeS**	**PFPeA**	**PFTeDA**	**PFTrDA**	**PFUnDA**	**Sum of PFAS**	**Sum of PFOS and PFHxS**	**PFOS**	**PFOA**	**PFHxS**
							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	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
						PQL	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.005	0.001	0.002	0.001	0.005	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.005	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
FSANZ 2017 2-6 years Crustaceans (invertebrate)																																	**0.065**	**0.065**	**0.52**	**0.065**
FSANZ 2017 2-6 years Finfish (fish)																																	**0.0052**	**0.0052**	**0.041**	**0.0052**
Location	**Field ID**	**Sampled Date**	**Fauna Group**	**Species**	**Sample Type**	**Lab Report**																														
BIOFA007	1302_BIOAFA125_191113	13/11/2019	Fish	Tarpon (Megalops cyprinoides)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA126_191113	13/11/2019	Fish	Tarpon (Megalops cyprinoides)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA127_191113	13/11/2019	Fish	Tarpon (Megalops cyprinoides)	Normal	ES1938881	<0.002	<0.002	0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.012	**0.010**	**0.006**	<0.001	0.004
	1302_BIOAFA128_191113	13/11/2019	Fish	Forktail Catfish 2 (Neoarius sp.2)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA129_191113	13/11/2019	Fish	Forktail Catfish 2 (Neoarius sp.2)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.014	**0.014**	**0.014**	<0.001	<0.001
	1302_BIOAFA130_191113	13/11/2019	Fish	Forktail Catfish 2 (Neoarius sp.2)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.004	0.004	<0.001	<0.001
	1302_BIOAFA131_191113	13/11/2019	Fish	Forktail Catfish 2 (Neoarius sp.2)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.006	**0.006**	**0.006**	<0.001	<0.001
	1302_BIOAFA136_191113	13/11/2019	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.009	**0.009**	0.005	<0.001	0.004
	1302_BIOAFA137_191113	13/11/2019	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES1938881	<0.002	<0.002	0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.005	0.003	0.002	<0.001	0.001
	1302_BIOAFA138_191113	13/11/2019	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.012	**0.012**	**0.008**	<0.001	0.004
	1302_BIOAFA178_201104	4/11/2020	Fish	Blue Salmon (Eleutheronema tetradactylum)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA179_201104	4/11/2020	Fish	Tarpon (Megalops cyprinoides)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA180_201104	4/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA181_201104	4/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.009	0.004	0.002	<0.001	0.002
	1302_BIOAFA182_201104	4/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.003	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA183_201104	4/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.009	0.001	0.001	<0.001	<0.001
	1302_BIOAFA184_201104	4/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.005	0.001	0.001	<0.001	<0.001
	1302_BIOAFA186_201104	4/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA187_201104	4/11/2020	Fish	Milkfish (Chanos chanos)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA189_201104	4/11/2020	Fish	Milkfish (Chanos chanos)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.015	0.001	0.001	<0.001	<0.001
	1302_BIOAFA190_201104	4/11/2020	Fish	Milkfish (Chanos chanos)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.019	0.002	0.002	<0.001	<0.001
	1302_BIOAFA191_201104	4/11/2020	Fish	Trevally (Caranx sp.)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.007	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA192_201104	4/11/2020	Fish	Trevally (Caranx sp.)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA193_201104	4/11/2020	Fish	Trevally (Caranx sp.)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA194_201104	4/11/2020	Fish	Ponyfish (Leiognathus equulus)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA195_201104	4/11/2020	Fish	Sea Mullet (Mugil cephalus)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.008	0.004	0.004	<0.001	<0.001
	1302_BIOAFA218_211125	25/11/2021	Fish	Sea Mullet (Mugil cephalus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA219_211125	25/11/2021	Fish	Sea Mullet (Mugil cephalus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA220_211125	25/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA221_211125	25/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA222_211125	25/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.001	<0.001	0.001
	1302_BIOAFA223_211125	25/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.003	0.003	0.002	<0.001	0.001
	1302_BIOAFA224_211125	25/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.004	0.002	<0.001	0.002
	1302_BIOAFA225_211125	25/11/2021	Fish	Sicklefish (Drepane punctata)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA226_211125	25/11/2021	Fish	Ponyfish (Leiognathus equulus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.005	0.005	0.005	<0.001	<0.001
	1302_BIOAFA227_211125	25/11/2021	Fish	Scat (Scatophagus sp.)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.009	**0.009**	**0.009**	<0.001	<0.001
	1302_BIOAFA228_211125	25/11/2021	Fish	Scat (Scatophagus sp.)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.008	**0.008**	**0.008**	<0.001	<0.001
	1302_BIOAFA229_211125	25/11/2021	Fish	Scat (Scatophagus sp.)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.004	0.004	<0.001	<0.001
	1302_BIOAFA230_211203	3/12/2021	Fish	Sea Mullet (Mugil cephalus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA231_211203	3/12/2021	Fish	Sea Mullet (Mugil cephalus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.004	0.004	<0.001	<0.001
	1302_BIOAFA232_211203	3/12/2021	Fish	Sea Mullet (Mugil cephalus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA233_211203	3/12/2021	Fish	Garfish (Hemiramphidae (family))	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA234_211203	3/12/2021	Fish	Northern Whiting (Sillago sihama)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA235_211203	3/12/2021	Fish	Northern Whiting (Sillago sihama)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA236_211203	3/12/2021	Fish	Northern Whiting (Sillago sihama)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA289_221026	26/10/2022	Fish	Barramundi (Lates calcarifer)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_QC144_221026	26/10/2022	Fish	Barramundi (Lates calcarifer)	Intra-lab Duplic	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA290_221026	26/10/2022	Fish	Barramundi (Lates calcarifer)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_QC145_221026	26/10/2022	Fish	Barramundi (Lates calcarifer)	Intra-lab Duplic	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA291_221026	26/10/2022	Fish	Barramundi (Lates calcarifer)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.004	0.004	<0.001	<0.001
	1302_QC146_221026	26/10/2022	Fish	Barramundi (Lates calcarifer)	Intra-lab Duplic	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.008	**0.008**	**0.008**	<0.001	<0.001
	1302_BIOAFA292_221026	26/10/2022	Fish	Forktail Catfish 1 (Neoarius sp.1)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.011	**0.011**	**0.007**	<0.001	0.004
	1302_QC147_221026	26/10/2022	Fish	Barramundi (Lates calcarifer)	Intra-lab Duplic	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.004	0.002	<0.001	0.002
	1302_BIOAFA293_221026	26/10/2022	Fish	Forktail Catfish 1 (Neoarius sp.1)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.004	0.002	<0.001	0.002
	1302_BIOAFA294_221026	26/10/2022	Fish	Forktail Catfish 1 (Neoarius sp.1)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.005	0.005	0.003	<0.001	0.002
	1302_BIOAFA295_221026	26/10/2022	Fish	Forktail Catfish 2 (Neoarius sp.2)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA296_221026	26/10/2022	Fish	Forktail Catfish 2 (Neoarius sp.2)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.03	**0.030**	**0.03**	<0.001	<0.001
	1302_BIOAFA297_221026	26/10/2022	Fish	Forktail Catfish 2 (Neoarius sp.2)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.036	**0.036**	**0.035**	<0.001	0.001
	1302_BIOAFA298_221026	26/10/2022	Fish	Banded Archerfish (Toxotes jaculatrix)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA299_221026	26/10/2022	Fish	Banded Archerfish (Toxotes jaculatrix)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA300_221026	26/10/2022	Fish	Sicklefish (Drepane punctata)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA301_221026	26/10/2022	Fish	Sea Mullet (Mugil cephalus)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA302_221026	26/10/2022	Fish	Sea Mullet (Mugil cephalus)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.009	**0.009**	**0.009**	<0.001	<0.001
	1302_BIOAFA303_221026	26/10/2022	Fish	Sea Mullet (Mugil cephalus)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA304_221026	26/10/2022	Fish	Sea Mullet (Mugil cephalus)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA305_221026	26/10/2022	Crustacean	Orange Mud Crab (Scylla olivacea)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
BIOFA016	1302_BIOAFA149_191115	15/11/2019	Invertebrate	Long Bum (Telescopium telescopium)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.013	0.010	0.009	0.003	0.001
	1302_BIOAFA150_191115	15/11/2019	Invertebrate	Long Bum (Telescopium telescopium)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.014	0.011	0.011	0.003	<0.001
	1302_BIOAFA151_191115	15/11/2019	Invertebrate	Long Bum (Telescopium telescopium)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.031	0.027	0.025	0.004	0.002
	1302_BIOAFA152_191115	15/11/2019	Invertebrate	Giant Mangrove Whelk (Terebralia palustris)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.01	0.010	0.01	<0.001	<0.001
	1302_BIOAFA153_191115	15/11/2019	Invertebrate	Giant Mangrove Whelk (Terebralia palustris)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.009	0.009	0.009	<0.001	<0.001
	1302_BIOAFA173_201103	3/11/2020	Invertebrate	Long Bum (Telescopium telescopium)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.036	0.004	0.002	0.007	0.002
	1302_BIOAFA174_201103	3/11/2020	Invertebrate	Long Bum (Telescopium telescopium)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.04	0.004	0.002	0.008	0.002
	1302_BIOAFA175_201103	3/11/2020	Invertebrate	Long Bum (Telescopium telescopium)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.021	0.002	0.001	0.006	0.001
	1302_BIOAFA176_201103	3/11/2020	Invertebrate	Giant Mangrove Whelk (Terebralia palustris)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.006	0.001	0.001	<0.001	<0.001
	1302_BIOAFA177_201103	3/11/2020	Invertebrate	Giant Mangrove Whelk (Terebralia palustris)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.006	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA204_211108	8/11/2021	Invertebrate	Long Bum (Telescopium telescopium)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.011	0.007	0.007	0.004	<0.001
	1302_BIOAFA284_221029	29/10/2022	Invertebrate	Long Bum (Telescopium telescopium)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.008	0.007	0.007	0.001	<0.001
	1302_BIOAFA285_221029	29/10/2022	Invertebrate	Long Bum (Telescopium telescopium)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.007	0.006	0.006	0.001	<0.001
	1302_BIOAFA286_221029	29/10/2022	Invertebrate	Long Bum (Telescopium telescopium)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.021	0.018	0.018	0.003	<0.001
	1302_BIOAFA287_221029	29/10/2022	Invertebrate	Giant Mangrove Whelk (Terebralia palustris)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.016	0.016	0.016	<0.001	<0.001
	1302_BIOAFA288_221029	29/10/2022	Invertebrate	Giant Mangrove Whelk (Terebralia palustris)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.004	0.004	<0.001	<0.001
BIOFA017	1302_BIOAFA205_211108	8/11/2021	Invertebrate	Long Bum (Telescopium telescopium)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.011	0.008	0.008	0.003	<0.001
BIOFA018	1302_BIOAFA100_191112	12/11/2019	Fish	Queenfish (Scomberoides commersonnianus)	Normal	ES1938881	<0.002	<0.002	0.004	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.01	**0.006**	**0.006**	<0.001	<0.001
	1302_BIOAFA101_191112	12/11/2019	Fish	Barramundi (Lates calcarifer)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA102_191112	12/11/2019	Fish	Barramundi (Lates calcarifer)	Normal	ES1938881	<0.002	<0.002	0.003	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.005	0.002	0.002	<0.001	<0.001
	1302_BIOAFA103_191112	12/11/2019	Fish	Barramundi (Lates calcarifer)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA104_191112	12/11/2019	Fish	Blue Salmon (Eleutheronema tetradactylum)	Normal	ES1938881	<0.002	<0.002	0.049	0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.071	**0.020**	**0.018**	<0.001	0.002
	1302_BIOAFA105_191112	12/11/2019	Fish	Blue Salmon (Eleutheronema tetradactylum)	Normal	ES1938881	<0.002	<0.002	0.062	0.003	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.095	**0.030**	**0.027**	<0.001	0.003
	1302_BIOAFA106_191112	12/11/2019	Fish	Blue Salmon (Eleutheronema tetradactylum)	Normal	ES1938881	<0.002	<0.002	0.051	0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.077	**0.024**	**0.021**	<0.001	0.003
	1302_BIOAFA107_191112	12/11/2019	Fish	Eel-tailed Catfish (Plotosus canius)	Normal	ES1938881	<0.002	<0.002	0.083	0.005	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.137	**0.048**	**0.043**	<0.001	0.005
	1302_BIOAFA108_191112	12/11/2019	Fish	Ponyfish (Leiognathus equulus)	Normal	ES1938881	<0.002	<0.002	0.087	0.004	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.137	**0.045**	**0.04**	<0.001	0.005
	1302_BIOAFA109_191112	12/11/2019	Crustacean	Sand Crab (Portunus pelagicus)	Normal	ES1938881	<0.002	<0.002	0.072	0.004	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	0.001	<0.001	<0.005	0.001	<0.002	<0.002	<0.002	<0.001	0.114	0.036	0.031	<0.001	0.005
	1302_BIOAFA110_191112	12/11/2019	Crustacean	Sand Crab (Portunus pelagicus)	Normal	ES1938881	<0.002	<0.002	0.051	0.003	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.085	0.031	0.027	<0.001	0.004

Table T5
Current and Historical Biota Analytical Results
PFAS OMP - RAAF Base Darwin
Department of Defence

AECOM

					PFAS Full Suite																												
					10:2 FTS	4:2 FTS	6:2 FTS	8:2 FTS	EtFOSA	EtFOSAA	EtFOSE	MeFOSA	MFOSA	MeFOSA	PFBS	PFBA	PFDS	PFDA	PFDoDA	PFHpS	PFHpA	PFHxA	PFNA	FOSA	PFPeS	PFPeA	PFTeDA	PFTrDA	PFUnDA	Sum of PFAS	Sum of PFOS and PFHxS	PFOS	PFOA	PFHxS
					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	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
				PQL	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.005	0.001	0.002	0.001	0.005	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.005	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
FSANZ 2017 2-6 years Crustaceans (invertebrate)																														**0.065**	**0.065**	**0.52**	**0.065**
FSANZ 2017 2-6 years Finfish (fish)																														**0.0052**	**0.0052**	**0.041**	**0.0052**
Location	**Field ID**	**Sampled Date**	**Fauna Group**	**Species**	**Sample Type**	**Lab Report**																											
	1302_BIOAFA111_191112	12/11/2019	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES1938881	<0.002	<0.002	0.043	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.062	**0.019**	**0.017**	<0.001	0.002
	1302_BIOAFA112_191112	12/11/2019	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES1938881	<0.002	<0.002	0.043	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.112	**0.069**	**0.055**	<0.001	**0.014**
	1302_BIOAFA113_191112	12/11/2019	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES1938881	<0.002	<0.002	0.048	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.077	**0.029**	**0.026**	<0.001	0.003
	1302_BIOAFA114_191112	12/11/2019	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES1938881	<0.002	<0.002	0.033	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.047	**0.014**	**0.012**	<0.001	0.002
	1302_BIOAFA120_191113	13/11/2019	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES1938881	<0.002	<0.002	0.03	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.045	**0.015**	**0.014**	<0.001	0.001
	1302_BIOAFA121_191113	13/11/2019	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES1938881	<0.002	<0.002	0.029	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.041	**0.012**	**0.011**	<0.001	0.001
	1302_BIOAFA122_191113	13/11/2019	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES1938881	<0.002	<0.002	0.028	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.043	**0.015**	**0.014**	<0.001	0.001
	1302_BIOAFA123_191113	13/11/2019	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES1938881	<0.002	<0.002	0.024	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.042	**0.018**	**0.017**	<0.001	0.001
	1302_BIOAFA124_191113	13/11/2019	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES1938881	<0.002	<0.002	0.025	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.036	**0.011**	**0.01**	<0.001	0.001
	1302_BIOAFA154_201103	3/11/2020	Fish	Pikey Bream (Acanthopagrus pacificus)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA155_201103	3/11/2020	Fish	Blue Salmon (Eleutheronema tetradactylum)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA156_201103	3/11/2020	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.001	0.001	<0.001	<0.001
	1302_BIOAFA157_201103	3/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.004	0.001	0.001	<0.001	<0.001
	1302_BIOAFA158_201103	3/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.005	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA159_201103	3/11/2020	Fish	Forktail Catfish 2 (Neoarius sp.2)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA160_201103	3/11/2020	Fish	Hawaiian Giant Herring (Elops hawaiensis)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA161_201103	3/11/2020	Fish	Flathead (Platycephalidae (family))	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA162_201103	3/11/2020	Fish	Archerfish (Toxotes chatareus)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA164_201103	3/11/2020	Fish	Trevally (Caranx sp.)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA165_201103	3/11/2020	Fish	Trevally (Caranx sp.)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.003	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA166_201103	3/11/2020	Fish	Trevally (Caranx sp.)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA167_201103	3/11/2020	Fish	Ponyfish (Leiognathus equulus)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.008	0.001	0.001	<0.001	<0.001
	1302_BIOAFA168_201103	3/11/2020	Fish	Ponyfish (Leiognathus equulus)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA170_201103	3/11/2020	Fish	Sea Mullet (Mugil cephalus)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA171_201103	3/11/2020	Fish	Sea Mullet (Mugil cephalus)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA172_201103	3/11/2020	Fish	Sea Mullet (Mugil cephalus)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA206_211108	8/11/2021	Invertebrate	Long Bum (Telescopium telescopium)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.011	0.008	0.008	0.003	<0.001
	1302_BIOAFA237_211124	24/11/2021	Fish	Barramundi (Lates calcarifer)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA238_211124	24/11/2021	Fish	Barramundi (Lates calcarifer)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA239_211124	24/11/2021	Fish	Barramundi (Lates calcarifer)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA240_211124	24/11/2021	Fish	Barramundi (Lates calcarifer)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.01	**0.010**	**0.007**	<0.001	0.003
	1302_BIOAFA241_211124	24/11/2021	Fish	Brown Sweetlips (Plectorhinchus gibbosus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA242_211124	24/11/2021	Fish	Brown Sweetlips (Plectorhinchus gibbosus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA243_211124	24/11/2021	Fish	Brown Sweetlips (Plectorhinchus gibbosus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA244_211124	24/11/2021	Fish	King Salmon (Polydactylus macrochir)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA245_211124	24/11/2021	Fish	King Salmon (Polydactylus macrochir)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA246_211124	24/11/2021	Fish	King Salmon (Polydactylus macrochir)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA247_211124	24/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.048	**0.048**	**0.039**	<0.001	**0.009**
	1302_BIOAFA248_211124	24/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.009	**0.009**	0.004	<0.001	0.005
	1302_BIOAFA249_211124	24/11/2021	Fish	Forktail Catfish 1 (Neoarius sp.1)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.031	**0.031**	**0.031**	<0.001	<0.001
	1302_BIOAFA250_211124	24/11/2021	Fish	Archerfish (Toxotes chatareus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA251_211124	24/11/2021	Fish	Archerfish (Toxotes chatareus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA252_211124	24/11/2021	Fish	Archerfish (Toxotes chatareus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA253_211124	24/11/2021	Fish	Scat (Scatophagus sp.)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.009	**0.009**	**0.009**	<0.001	<0.001
	1302_BIOAFA254_211124	24/11/2021	Fish	Scat (Scatophagus sp.)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.002	0.002	0.002	<0.001	<0.001
	1302_BIOAFA255_211124	24/11/2021	Fish	Scat (Scatophagus sp.)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA256_211124	24/11/2021	Fish	Barred Javelin (Pomadasys kaakan)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA257_211124	24/11/2021	Fish	Bull Shark (Carcharhinus leucas)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.001	0.001	0.001	<0.001	<0.001
	1302_BIOAFA258_221025	25/10/2022	Fish	Barramundi (Lates calcarifer)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_QC140_221025	25/10/2022	Fish	Barramundi (Lates calcarifer)	Intra-lab Duplic	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA259_221025	25/10/2022	Fish	Barramundi (Lates calcarifer)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_QC141_221025	25/10/2022	Fish	Barramundi (Lates calcarifer)	Intra-lab Duplic	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA260_221025	25/10/2022	Fish	Barramundi (Lates calcarifer)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_QC142_221025	25/10/2022	Fish	Barramundi (Lates calcarifer)	Intra-lab Duplic	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA261_221025	25/10/2022	Fish	Barramundi (Lates calcarifer)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_QC143_221025	25/10/2022	Fish	Barramundi (Lates calcarifer)	Intra-lab Duplic	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA262_221025	25/10/2022	Fish	Barramundi (Lates calcarifer)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA263_221025	25/10/2022	Fish	Barramundi (Lates calcarifer)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA264_221025	25/10/2022	Fish	Barramundi (Lates calcarifer)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA265_221025	25/10/2022	Fish	Barramundi (Lates calcarifer)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA266_221025	25/10/2022	Fish	Forktail Catfish 1 (Neoarius sp.1)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	1302_BIOAFA267_221025	25/10/2022	Fish	Forktail Catfish 1 (Neoarius sp.1)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002

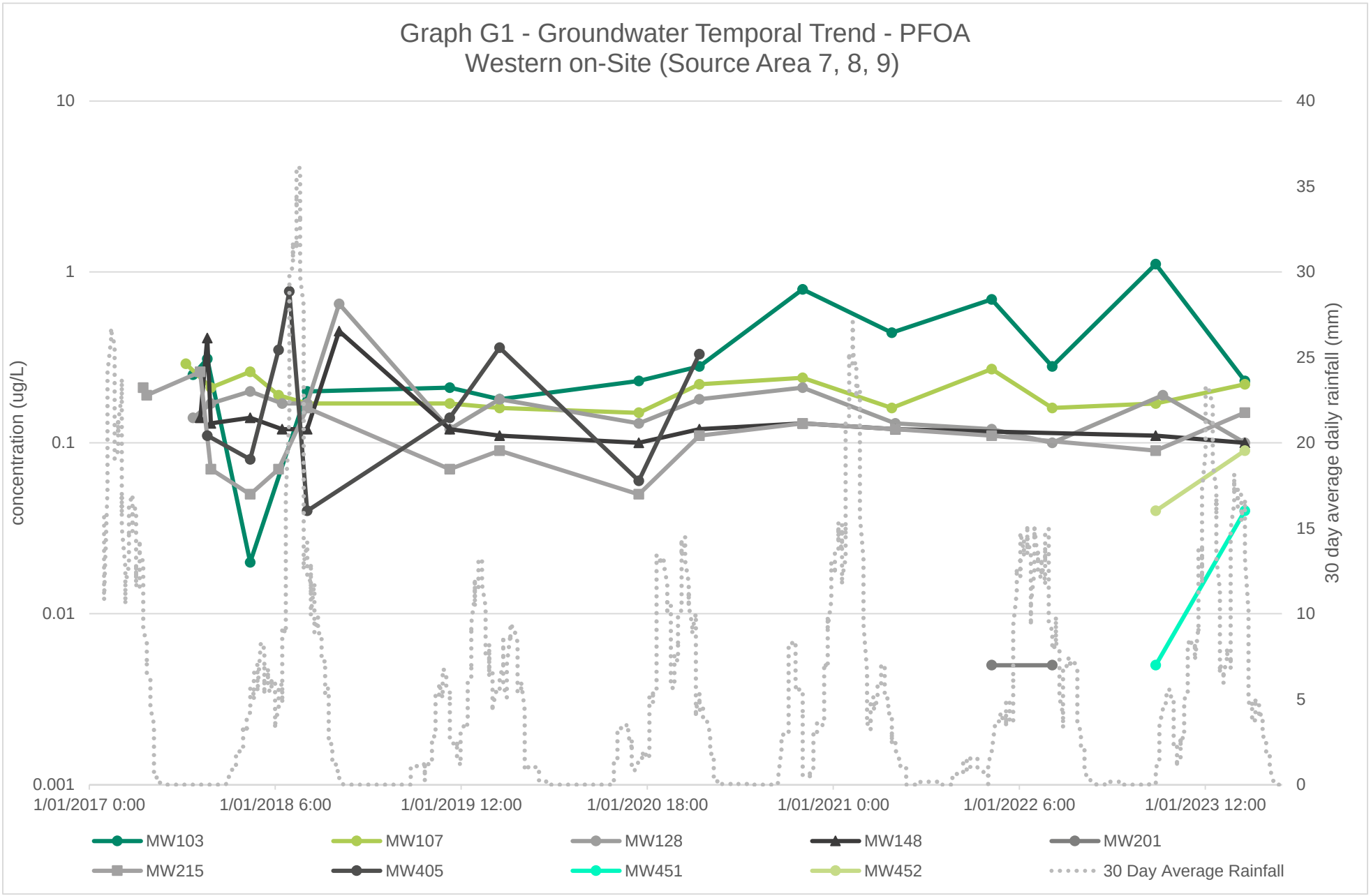
Table T5
Current and Historical Biota Analytical Results
PFAS OMP - RAAF Base Darwin
Department of Defence

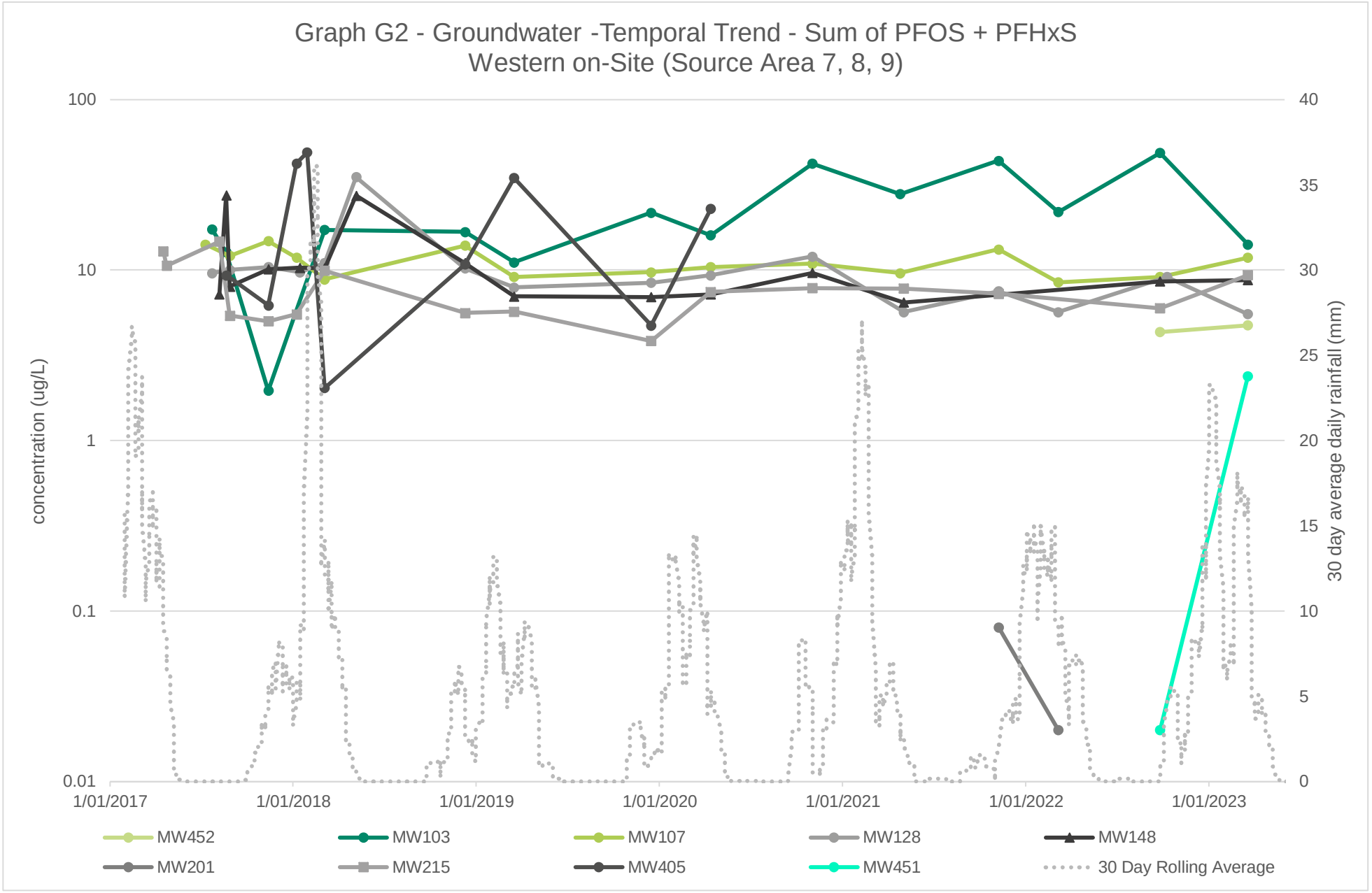
Location	Field ID	Sampled Date	Fauna Group	Species	Sample Type	Lab Report	PFAS Full Suite																													
							10:2 FTS	**4:2 FTS**	**6:2 FTS**	**8:2 FTS**	**ErFOSA**	**EtFOSAA**	**EdFOSE**	**MeFOSA**	**MFOSA**	**MeFOSA**	**PFBS**	**PFBA**	**PFDS**	**PFDA**	**PFDoDA**	**PFHpS**	**PFHpA**	**PFHxA**	**PFNA**	**FOSA**	**PFPeS**	**PFPeA**	**PFTeDA**	**PFTrDA**	**PFUnDA**	**Sum of PFAS**	**Sum of PFOS and PFHxS**	**PFOS**	**PFOA**	**PFHxS**
							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	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
						PQL	0.002	0.002	0.002	0.002	0.002	0.001	0.002	0.005	0.001	0.002	0.001	0.005	0.002	0.001	0.002	0.001	0.001	0.001	0.001	0.005	0.001	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001
FSANZ 2017 2-6 years Crustaceans (invertebrate)																																	**0.065**	**0.065**	**0.52**	**0.065**
FSANZ 2017 2-6 years Finfish (fish)																																	**0.0052**	**0.0052**	**0.041**	**0.0052**
Location	**Field ID**	**Sampled Date**	**Fauna Group**	**Species**	**Sample Type**	**Lab Report**																														
	1302_BIOAFA310_221031	31/10/2022	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.078	**0.078**	**0.066**	<0.001	0.012
	1302_BIOAFA311_221031	31/10/2022	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.05	0.050	0.038	<0.001	0.012
BIOFA028	1302_BIOAFA145_191115	15/11/2019	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	0.003	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	0.002	<0.001	<0.005	0.001	<0.002	<0.002	<0.002	<0.001	0.024	0.018	0.011	<0.001	0.007
	1302_BIOAFA146_191115	15/11/2019	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	0.003	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	0.001	<0.001	<0.005	0.002	<0.002	<0.002	<0.002	<0.001	0.032	0.026	0.016	<0.001	0.010
	1302_BIOAFA147_191115	15/11/2019	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	Normal	ES1938881	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.01	0.010	0.005	<0.001	0.005
	1302_BIOAFA196_201107	7/11/2020	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	0.001	<0.002	<0.002	<0.002	<0.001	0.024	0.011	0.003	<0.001	0.008
	1302_BIOAFA197_201107	7/11/2020	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	Normal	ES2040589	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.012	0.008	0.002	<0.001	0.006
	1302_BIOAFA209_211113	13/11/2021	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	0.002	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	0.002	<0.001	<0.005	0.002	<0.002	<0.002	<0.002	<0.001	0.044	0.038	0.022	<0.001	0.016
	1302_BIOAFA210_211113	13/11/2021	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	0.004	<0.001	<0.001	<0.001	<0.001	<0.005	0.001	<0.002	0.003	0.002	<0.001	0.075	0.065	0.047	<0.001	0.018
	1302_BIOAFA211_211113	13/11/2021	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	Normal	ES2203382	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	0.002	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	0.002	<0.001	<0.005	0.002	<0.002	<0.002	<0.002	<0.001	0.074	**0.068**	0.047	<0.001	0.021
	1302_BIOAFA306_221031	31/10/2022	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	0.001	<0.001	0.002	<0.001	<0.005	0.001	<0.002	<0.002	<0.002	<0.001	0.055	0.049	0.031	0.002	0.018
	1302_BIOAFA307_221031	31/10/2022	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	0.002	<0.001	0.001	<0.001	<0.005	0.001	<0.002	<0.002	<0.002	<0.001	0.145	**0.139**	**0.115**	0.002	0.024
	1302_BIOAFA308_221031	31/10/2022	Crustacean	Redclaw Crayfish (Cherux quadricarinatus)	Primary	ES2240147	<0.002	<0.002	<0.002	<0.002	<0.002	<0.001	<0.002	<0.005	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.002	<0.001	<0.001	<0.001	<0.001	<0.005	<0.001	<0.002	<0.002	<0.002	<0.001	0.019	0.019	0.01	<0.001	0.009

Notes:
PQL: Practical Quantitation Limits
mg/kg: milligrams per kilogram
(mm): millimetres
(g): grams

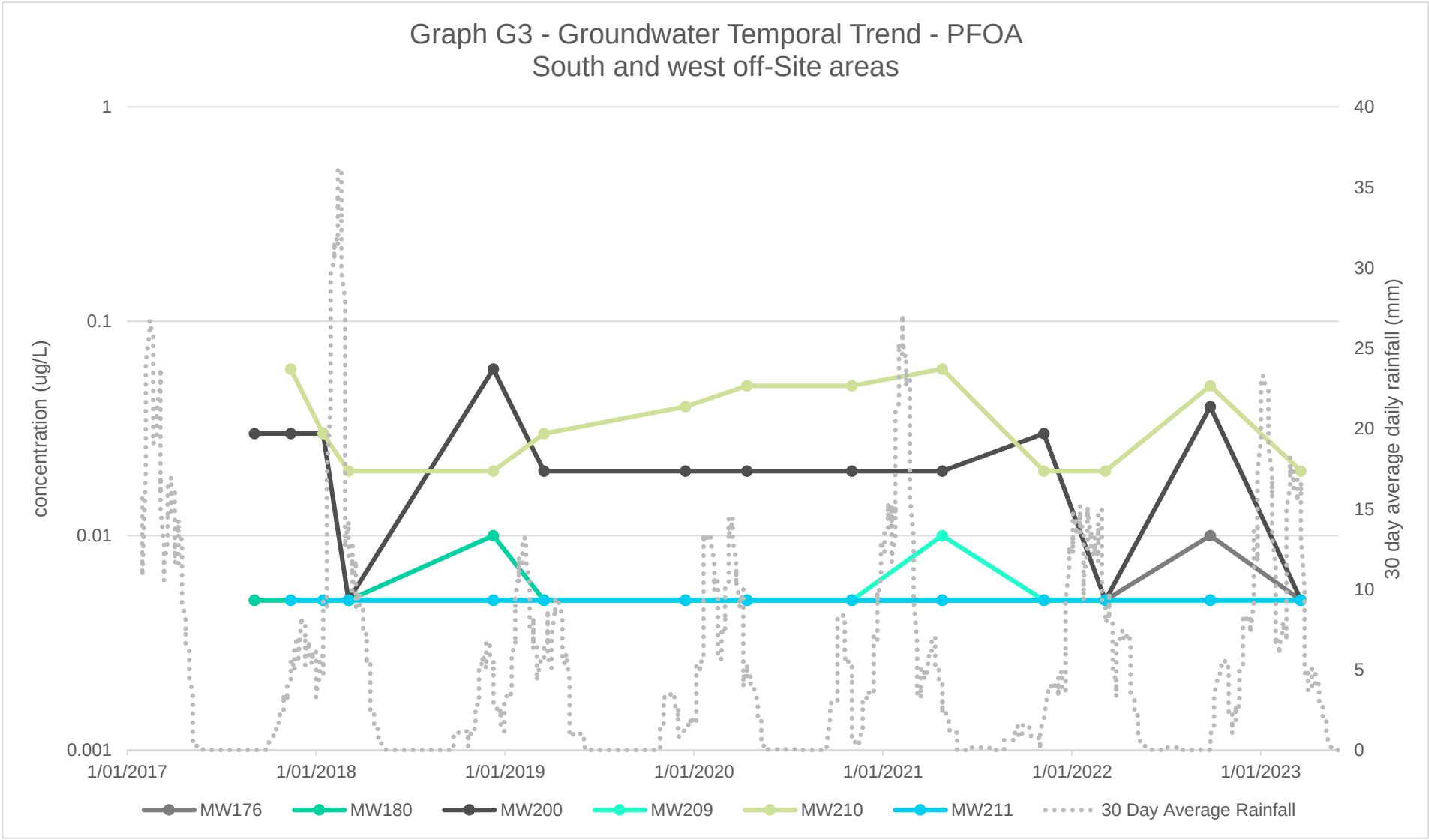
Appendix D

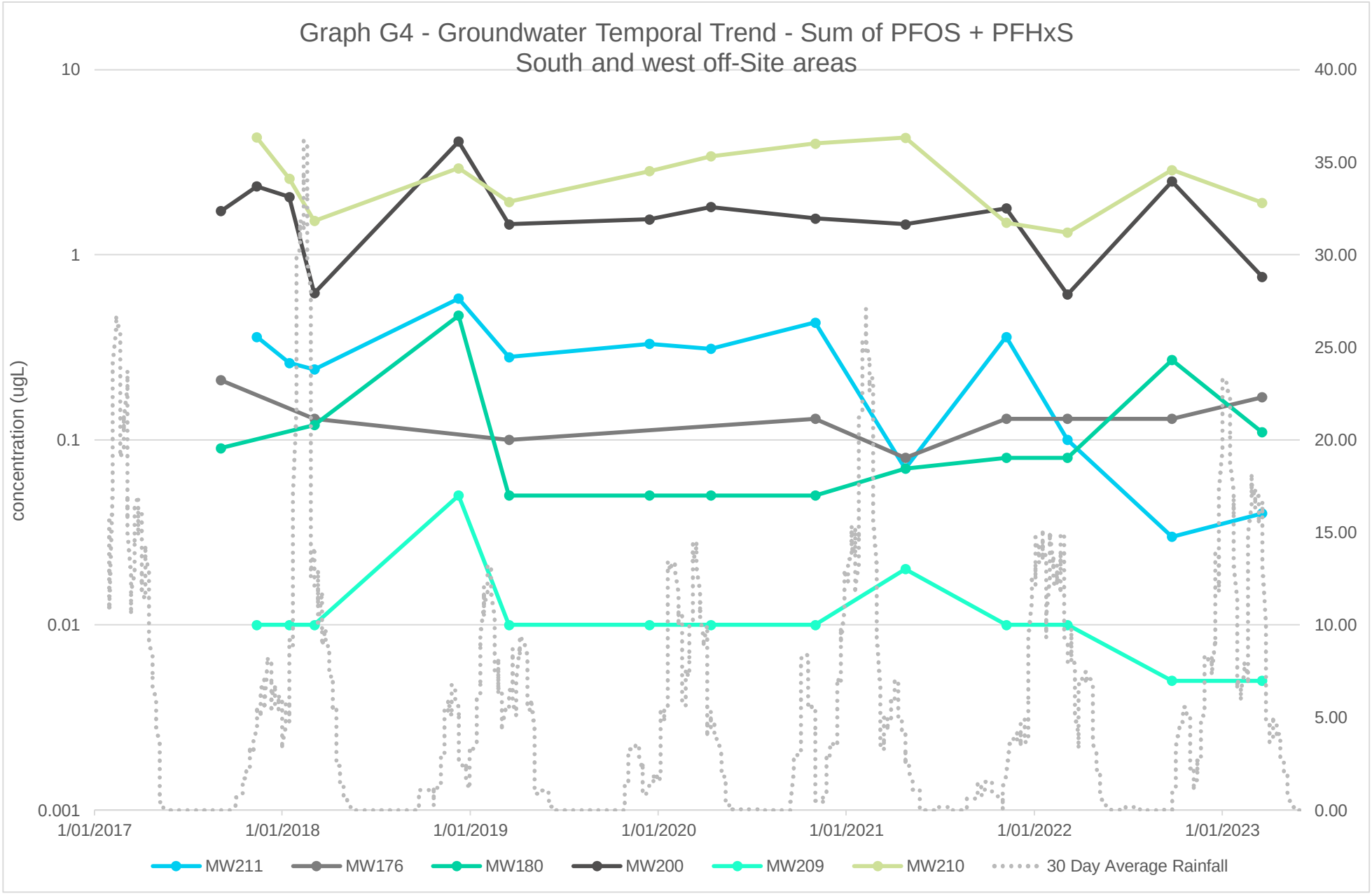
Graphs

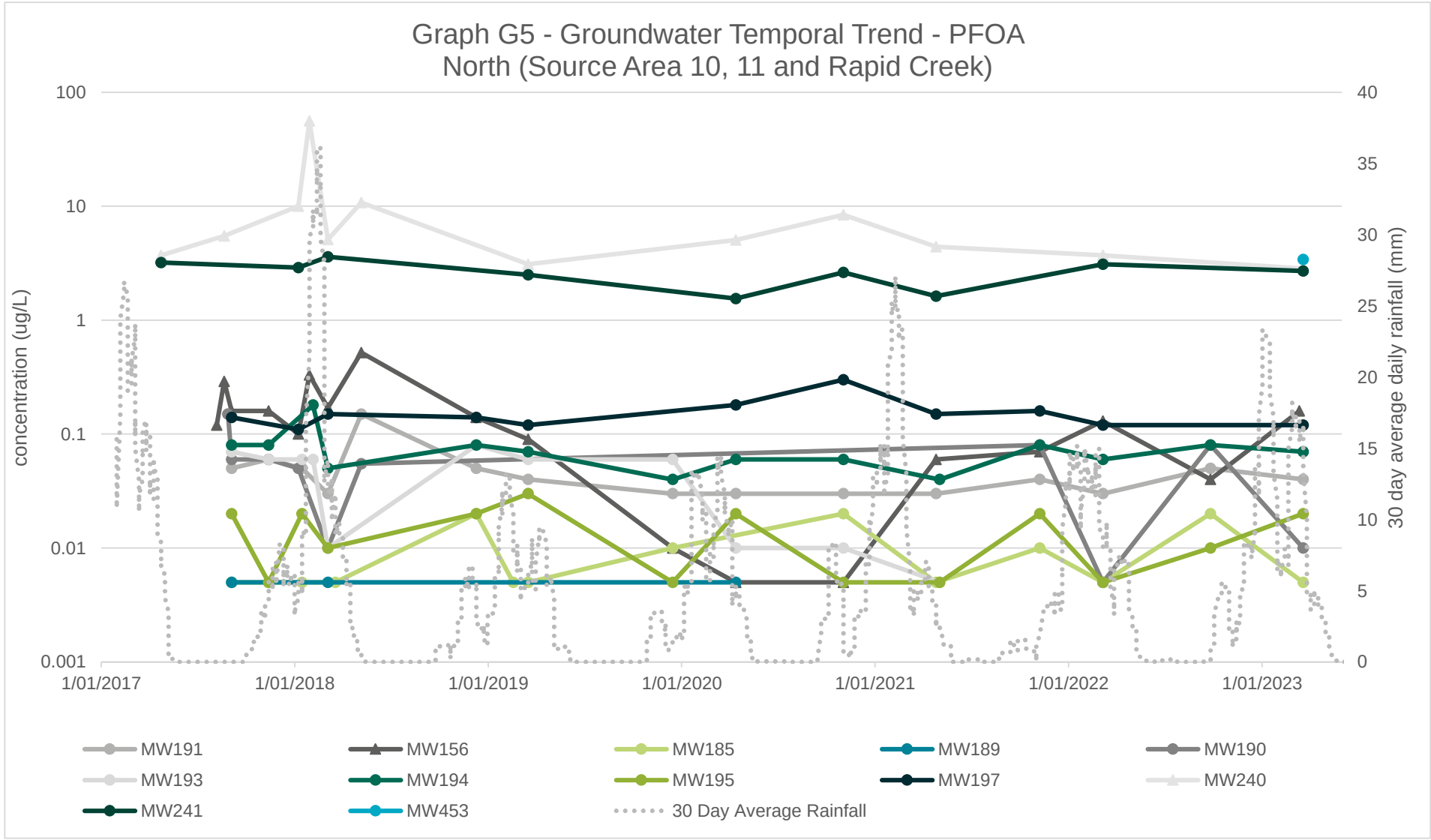

Graph G1 - Groundwater Temporal Trend - PFOA
Western on-Site (Source Area 7, 8, 9)
concentration (ug/L)
10
1
0.1
0.01
0.001
30 day average daily rainfall (mm)
40
35
30
25
20
15
10
5
0
1/01/2017 0:00
1/01/2018 6:00
1/01/2019 12:00
1/01/2020 18:00
1/01/2021 0:00
1/01/2022 6:00
1/01/2023 12:00
MW103
MW107
MW128
MW148
MW201
MW215
MW405
MW451
MW452
30 Day Average Rainfall

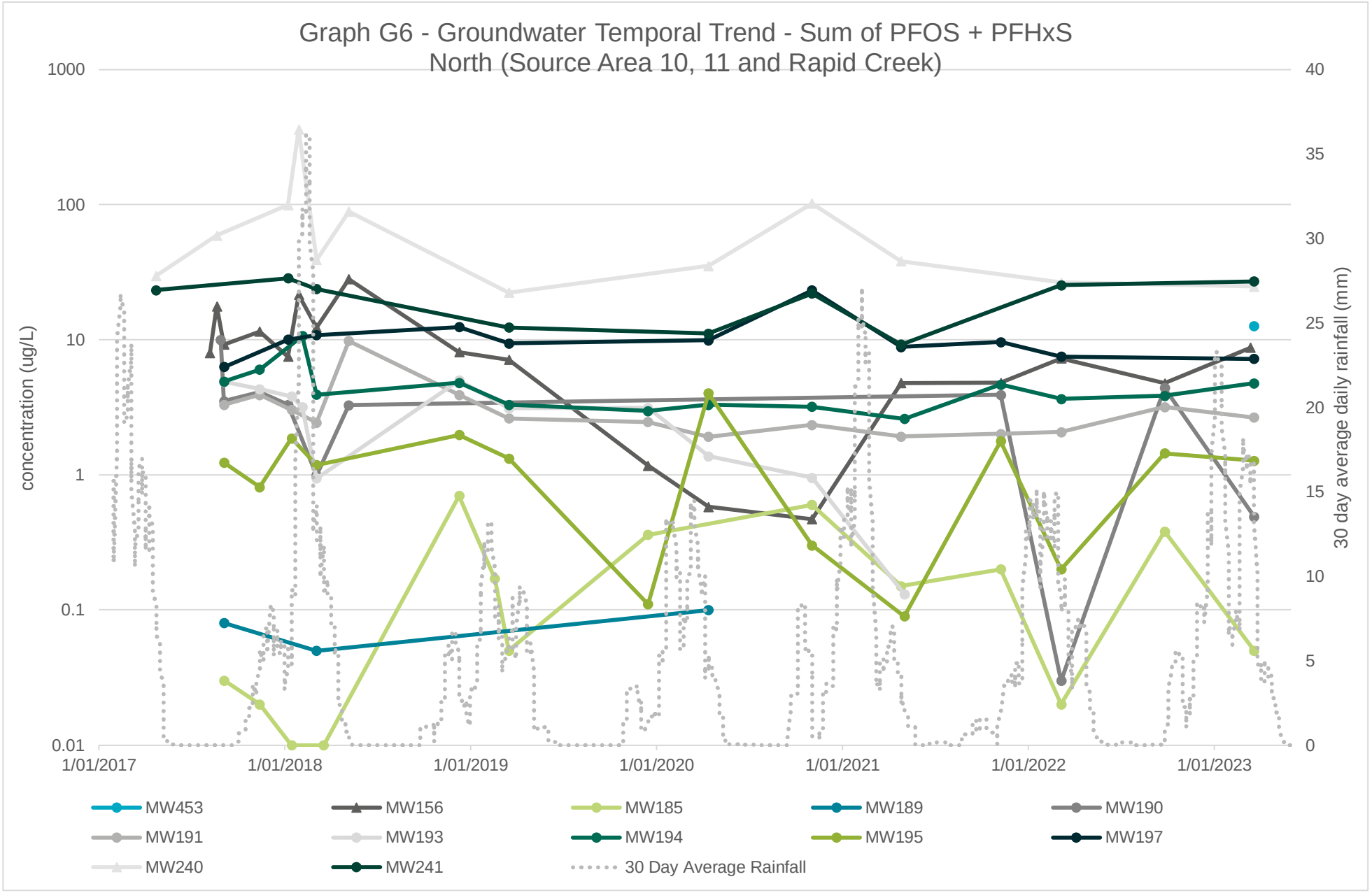

Graph G2 - Groundwater -Temporal Trend - Sum of PFOS + PFHxS
Western on-Site (Source Area 7, 8, 9)
concentration (ug/L)
30 day average daily rainfall (mm)
100
10
1
0.1
0.01
40
35
30
25
20
15
10
5
0
1/01/2017
1/01/2018
1/01/2019
1/01/2020
1/01/2021
1/01/2022
1/01/2023
MW452
MW103
MW107
MW128
MW148
MW201
MW215
MW405
MW451
30 Day Rolling Average

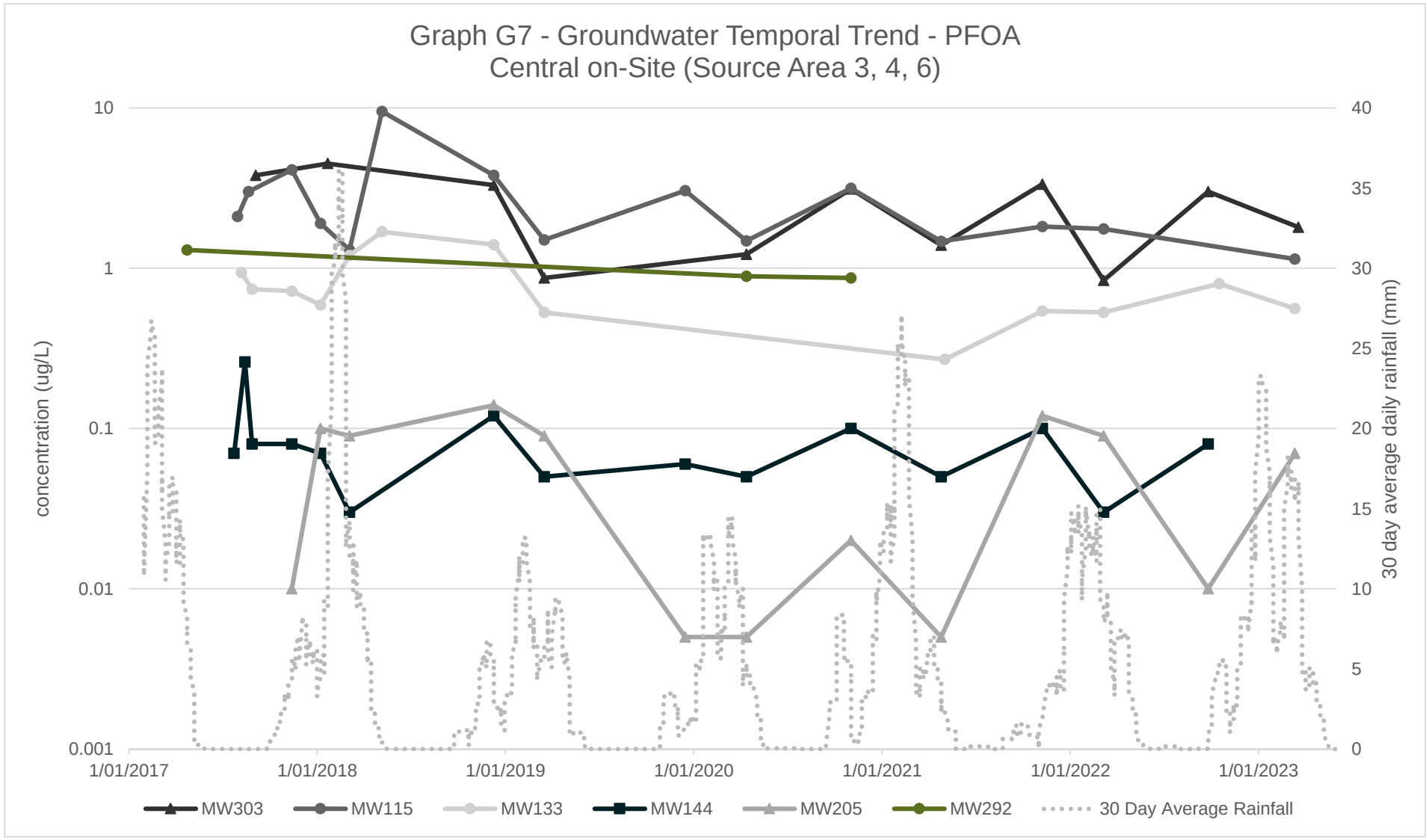
Graph G3 - Groundwater Temporal Trend - PFOA
South and west off-Site areas

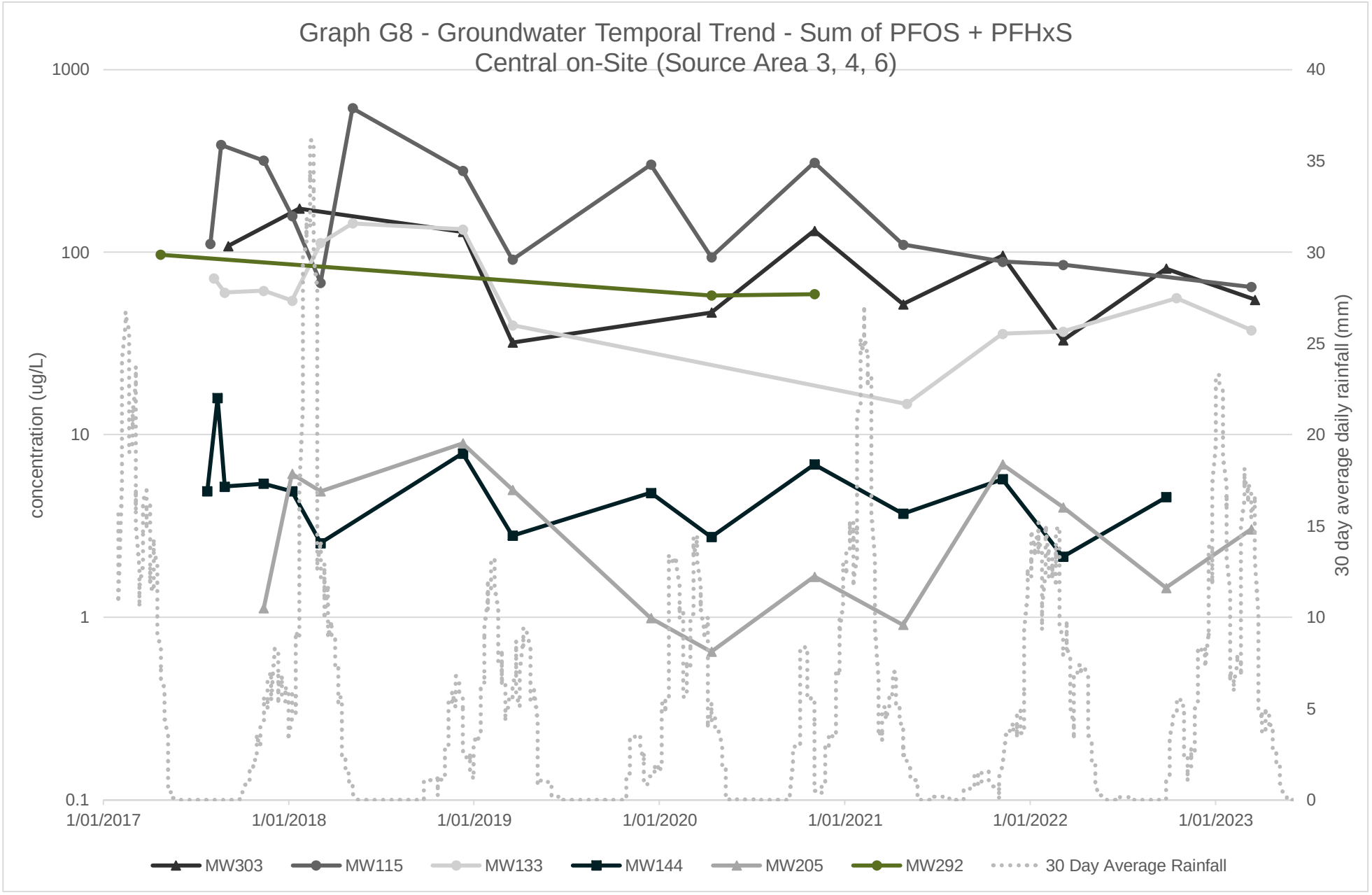


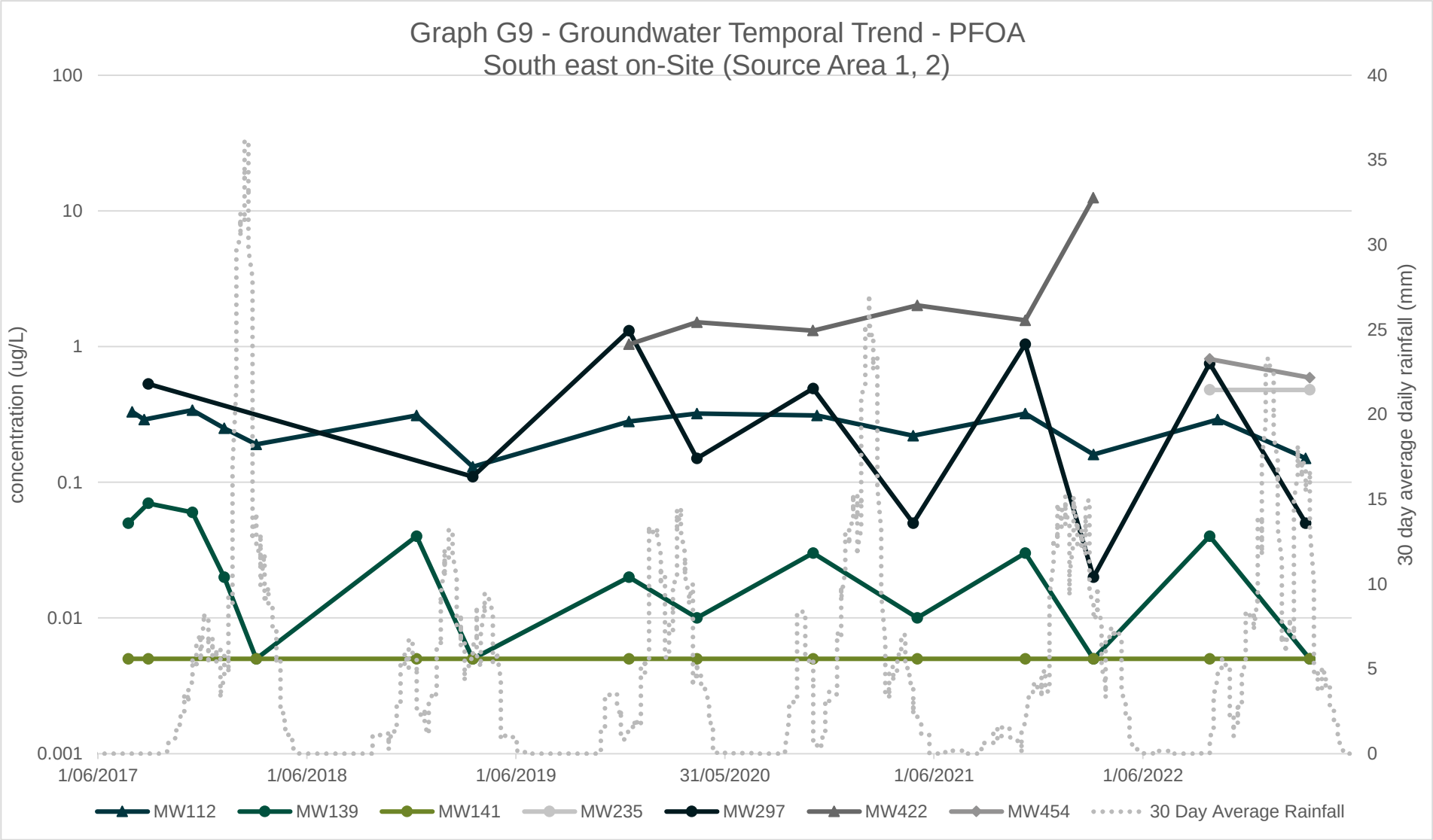

Graph G4 - Groundwater Temporal Trend - Sum of PFOS + PFHxS
South and west off-Site areas
concentration (ugL)
10
1
0.1
0.01
0.001
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
1/01/2017
1/01/2018
1/01/2019
1/01/2020
1/01/2021
1/01/2022
1/01/2023
MW211
MW176
MW180
MW200
MW209
MW210
30 Day Average Rainfall

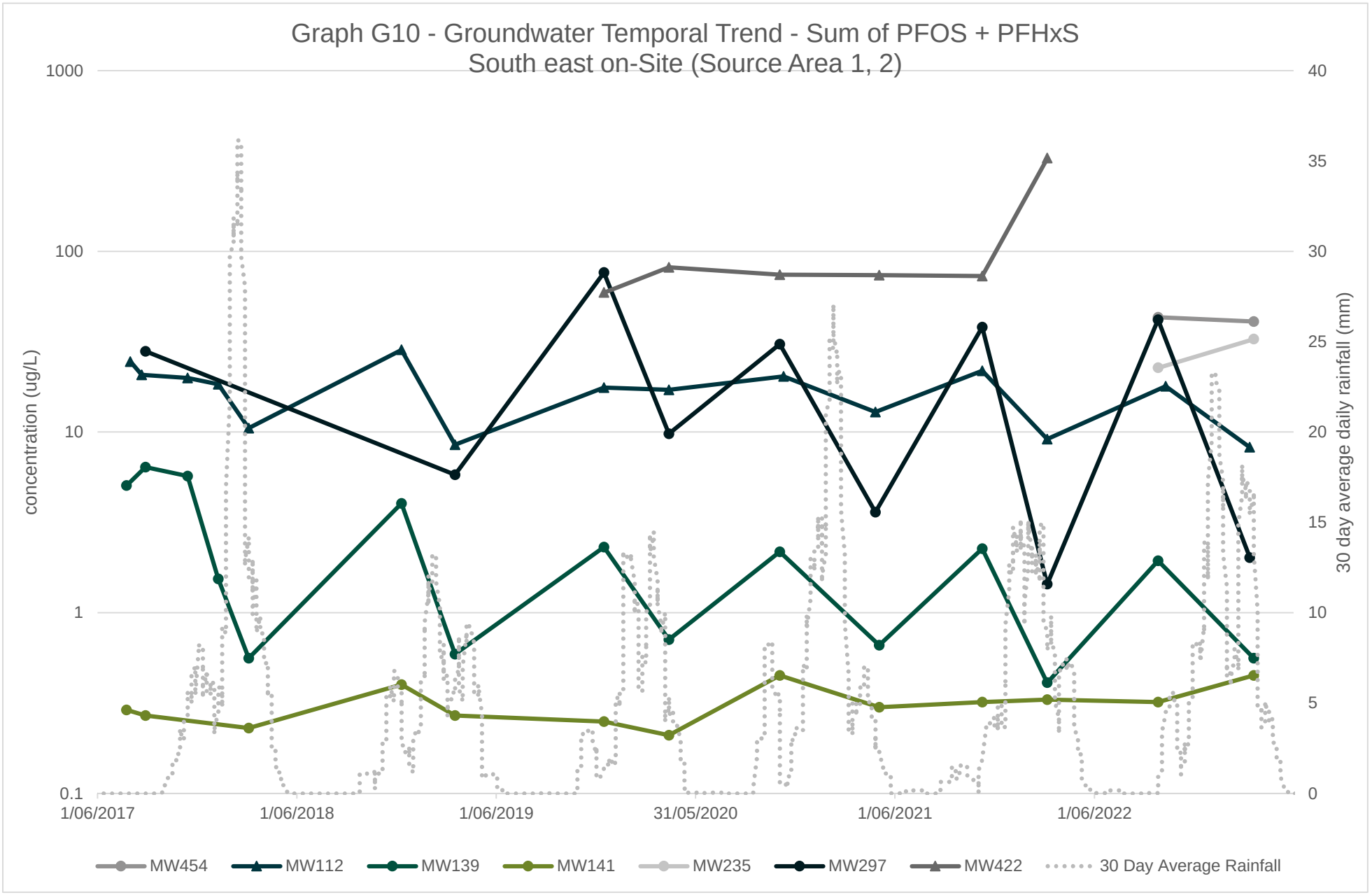

Graph G5 - Groundwater Temporal Trend - PFOA
North (Source Area 10, 11 and Rapid Creek)
concentration (ug/L)
100
10
1
0.1
0.01
0.001
30 day average daily rainfall (mm)
40
35
30
25
20
15
10
5
0
1/01/2017
1/01/2018
1/01/2019
1/01/2020
1/01/2021
1/01/2022
1/01/2023
MW191
MW156
MW185
MW189
MW190
MW193
MW194
MW195
MW197
MW240
MW241
MW453
30 Day Average Rainfall

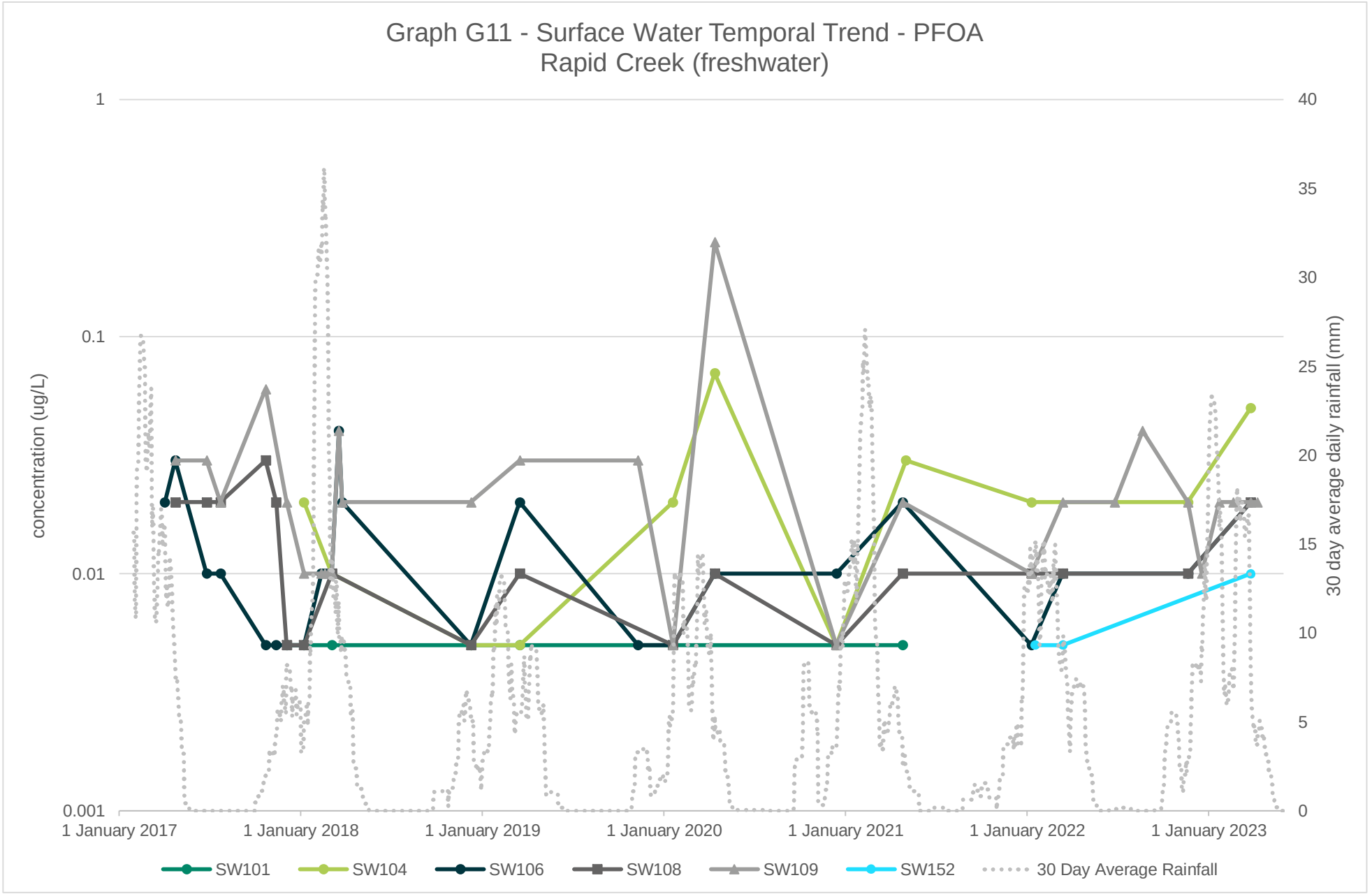

Graph G6 - Groundwater Temporal Trend - Sum of PFOS + PFHxS
North (Source Area 10, 11 and Rapid Creek)
concentration (ug/L)
1000
100
10
1
0.1
0.01
30 day average daily rainfall (mm)
40
35
30
25
20
15
10
5
0
1/01/2017
1/01/2018
1/01/2019
1/01/2020
1/01/2021
1/01/2022
1/01/2023
MW453
MW156
MW185
MW189
MW190
MW191
MW193
MW194
MW195
MW197
MW240
MW241
30 Day Average Rainfall

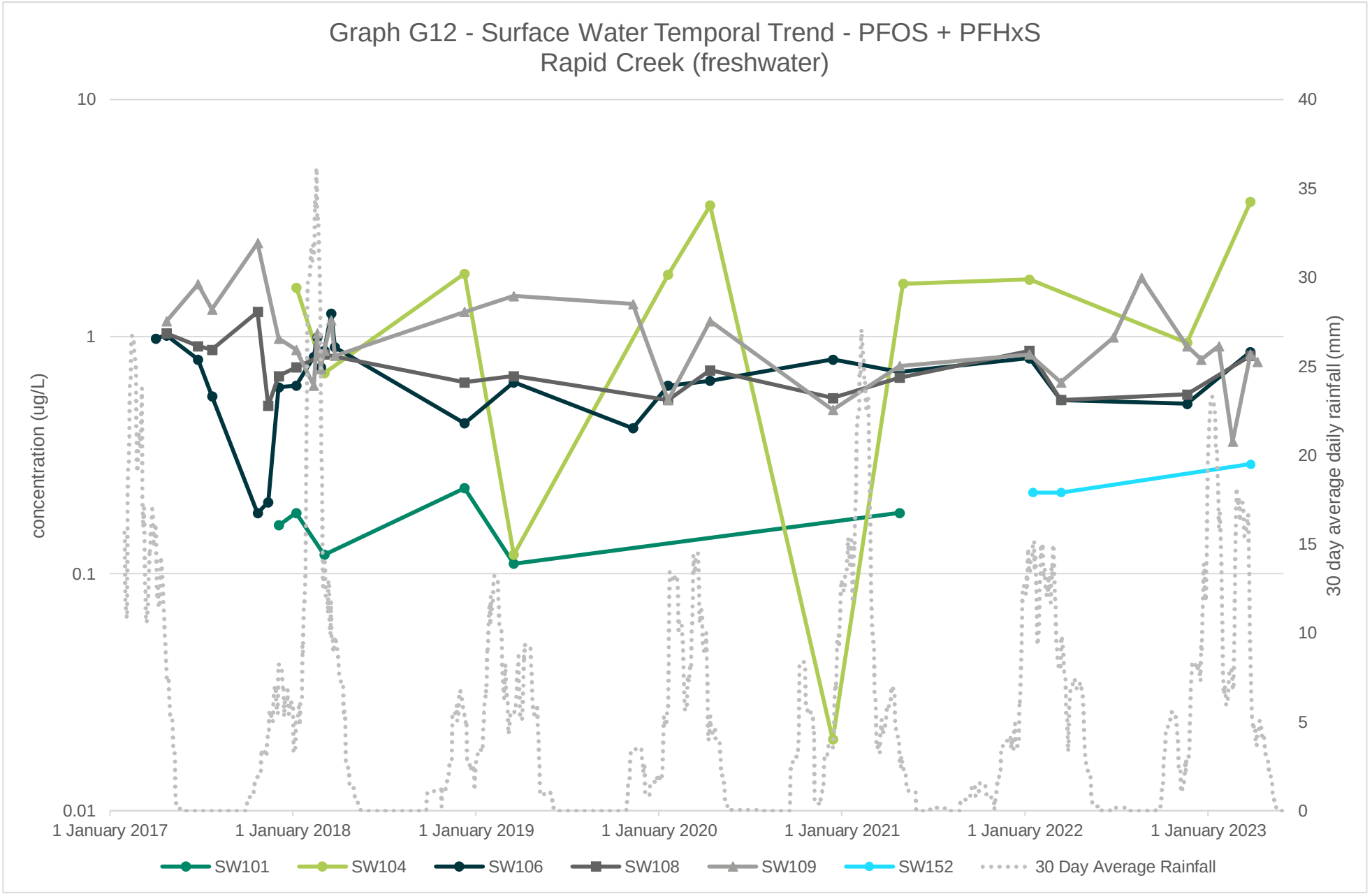

Graph G7 - Groundwater Temporal Trend - PFOA
Central on-Site (Source Area 3, 4, 6)
concentration (ug/L)
30 day average daily rainfall (mm)
10
1
0.1
0.01
0.001
40
35
30
25
20
15
10
5
0
1/01/2017
1/01/2018
1/01/2019
1/01/2020
1/01/2021
1/01/2022
1/01/2023
MW303
MW115
MW133
MW144
MW205
MW292
30 Day Average Rainfall

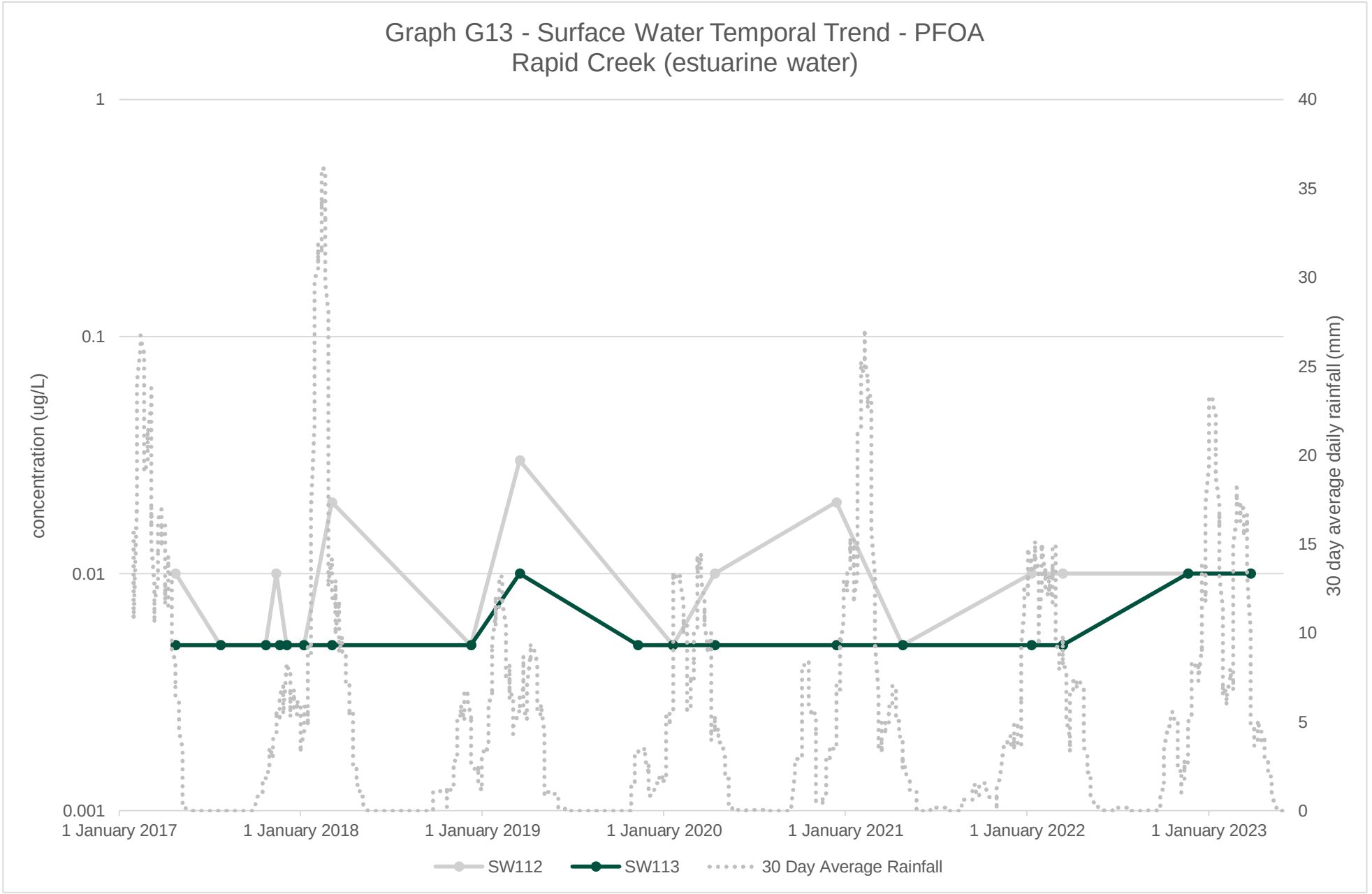

Graph G8 - Groundwater Temporal Trend - Sum of PFOS + PFHxS
Central on-Site (Source Area 3, 4, 6)
concentration (ug/L)
30 day average daily rainfall (mm)
1000
100
10
1
0.1
40
35
30
25
20
15
10
5
0
1/01/2017
1/01/2018
1/01/2019
1/01/2020
1/01/2021
1/01/2022
1/01/2023
MW303
MW115
MW133
MW144
MW205
MW292
30 Day Average Rainfall

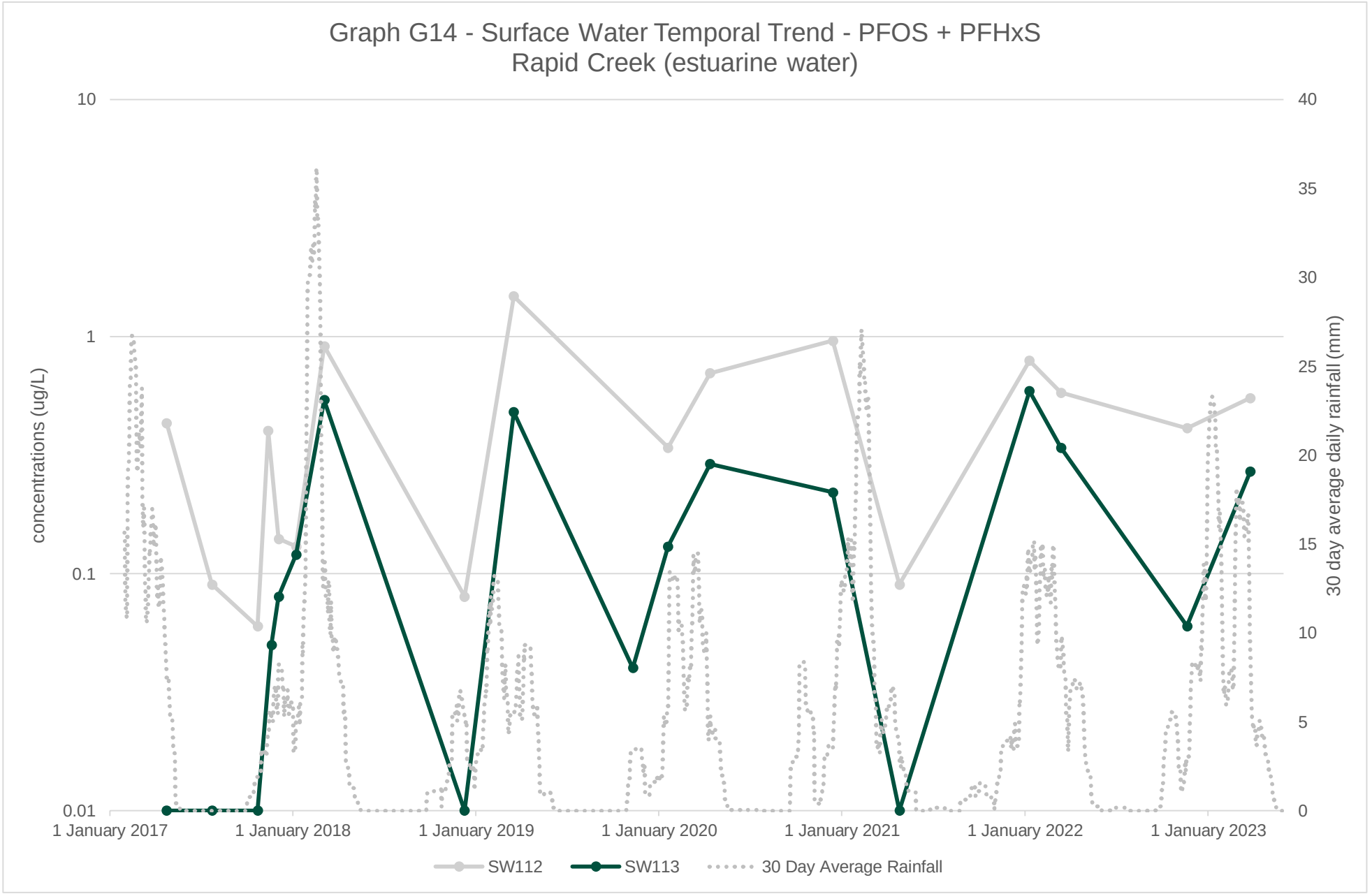

Graph G9 - Groundwater Temporal Trend - PFOA
South east on-Site (Source Area 1, 2)
concentration (ug/L)
100
10
1
0.1
0.01
0.001
40
35
30
25
20
15
10
5
0
30 day average daily rainfall (mm)
1/06/2017
1/06/2018
1/06/2019
31/05/2020
1/06/2021
1/06/2022
MW112
MW139
MW141
MW235
MW297
MW422
MW454
30 Day Average Rainfall

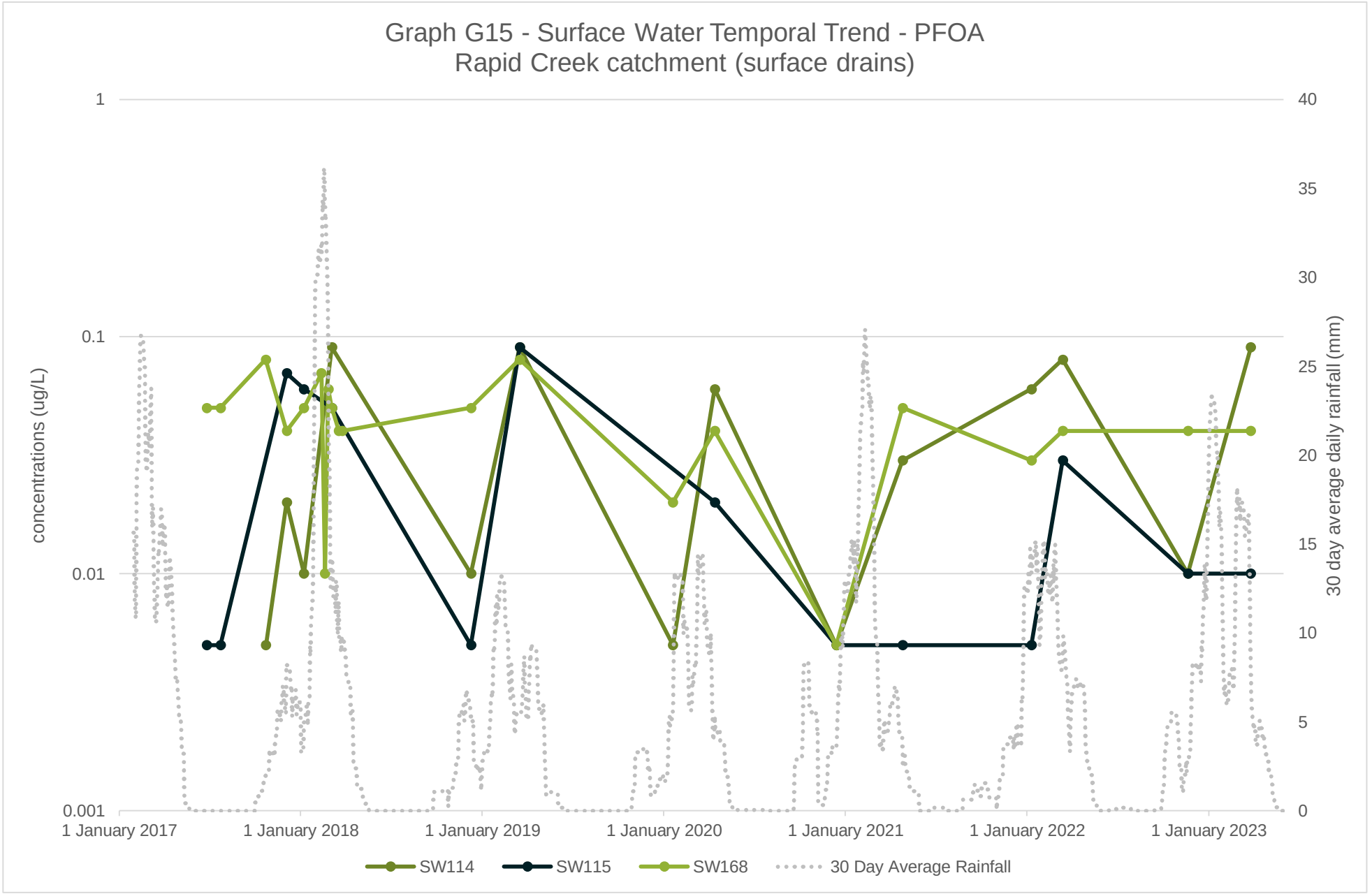

Graph G10 - Groundwater Temporal Trend - Sum of PFOS + PFHxS
South east on-Site (Source Area 1, 2)
concentration (ug/L)
1000
100
10
1
0.1
40
35
30
25
20
15
10
5
0
30 day average daily rainfall (mm)
1/06/2017
1/06/2018
1/06/2019
31/05/2020
1/06/2021
1/06/2022
MW454
MW112
MW139
MW141
MW235
MW297
MW422
30 Day Average Rainfall

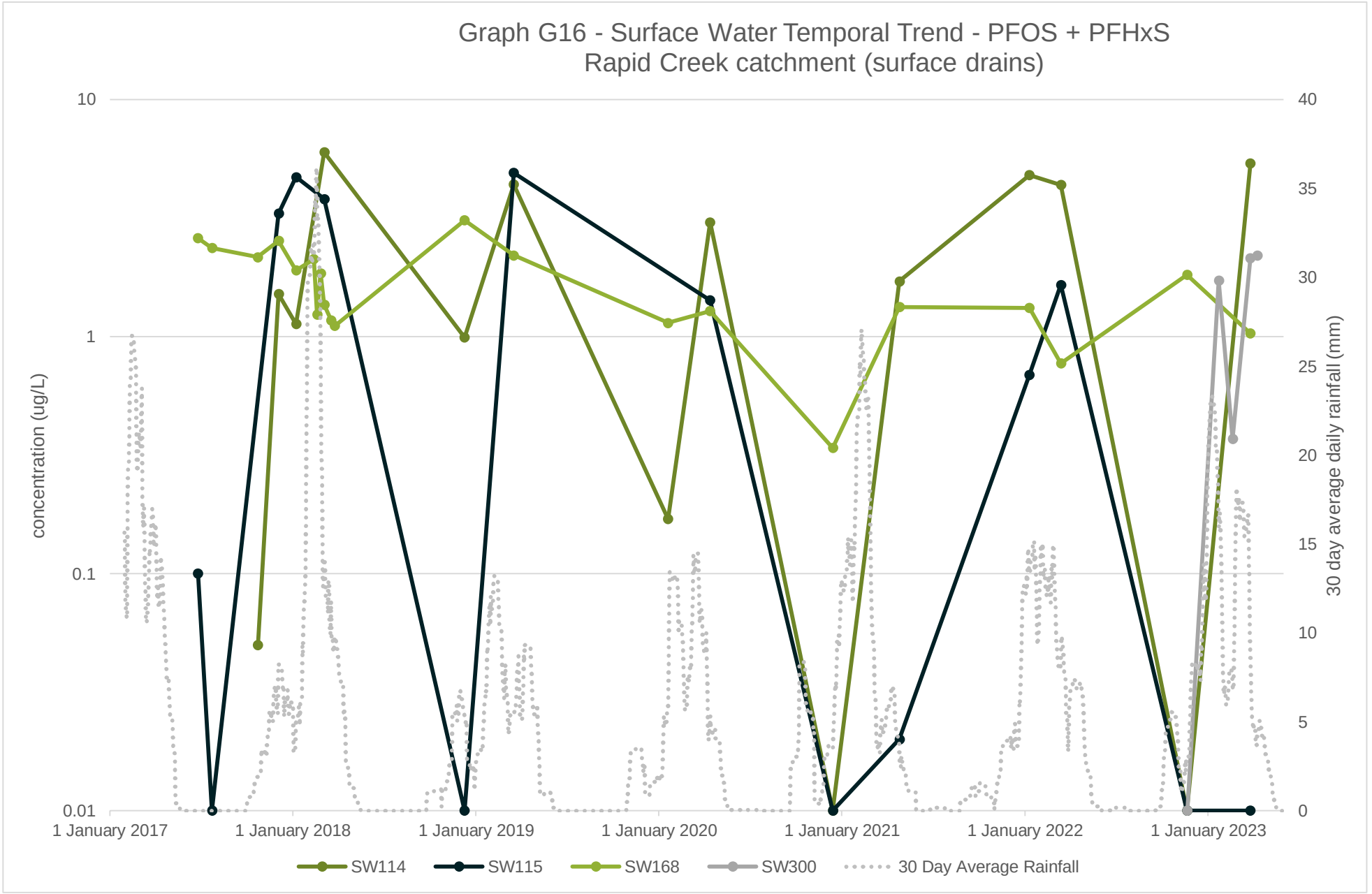

Graph G11 - Surface Water Temporal Trend - PFOA
Rapid Creek (freshwater)
concentration (ug/L)
1
0.1
0.01
0.001
30 day average daily rainfall (mm)
40
35
30
25
20
15
10
5
0
1 January 2017
1 January 2018
1 January 2019
1 January 2020
1 January 2021
1 January 2022
1 January 2023
SW101
SW104
SW106
SW108
SW109
SW152
30 Day Average Rainfall

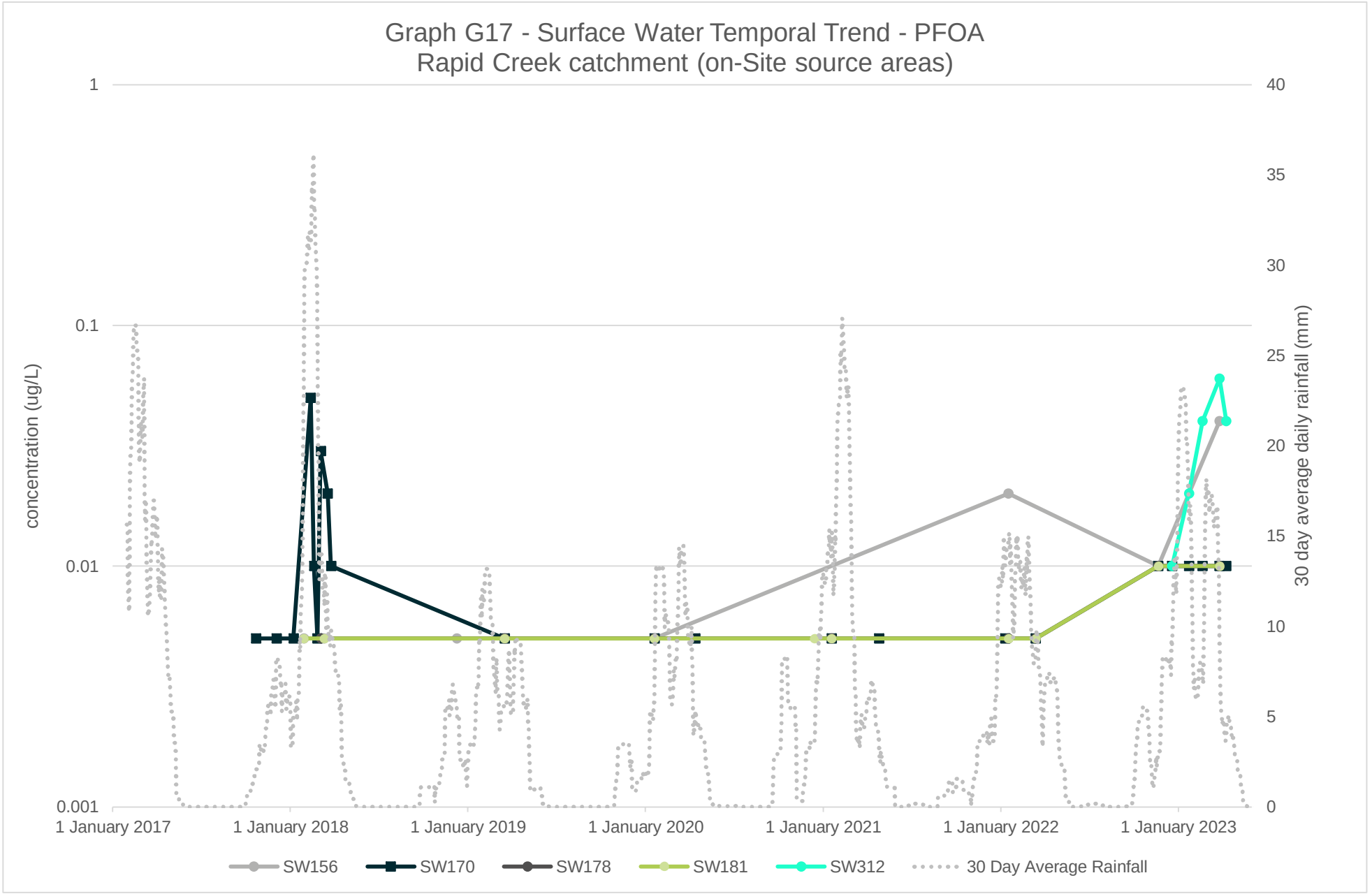

Graph G12 - Surface Water Temporal Trend - PFOS + PFHxS
Rapid Creek (freshwater)
concentration (ug/L)
10
1
0.1
0.01
30 day average daily rainfall (mm)
40
35
30
25
20
15
10
5
0
1 January 2017
1 January 2018
1 January 2019
1 January 2020
1 January 2021
1 January 2022
1 January 2023
SW101
SW104
SW106
SW108
SW109
SW152
30 Day Average Rainfall

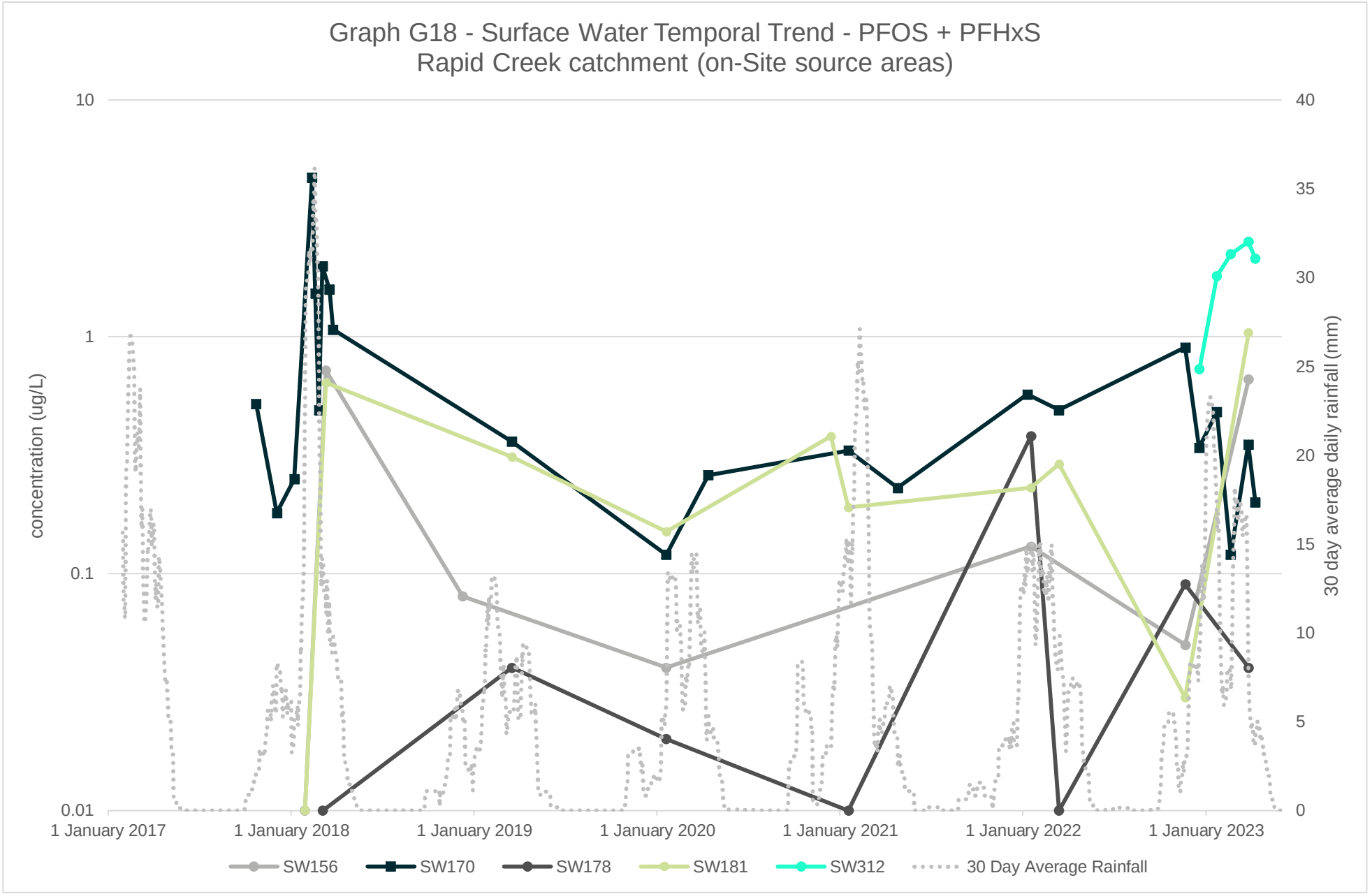

Graph G13 - Surface Water Temporal Trend - PFOA
Rapid Creek (estuarine water)
concentration (ug/L)
1
0.1
0.01
0.001
30 day average daily rainfall (mm)
40
35
30
25
20
15
10
5
0
1 January 2017
1 January 2018
1 January 2019
1 January 2020
1 January 2021
1 January 2022
1 January 2023
SW112
SW113
30 Day Average Rainfall

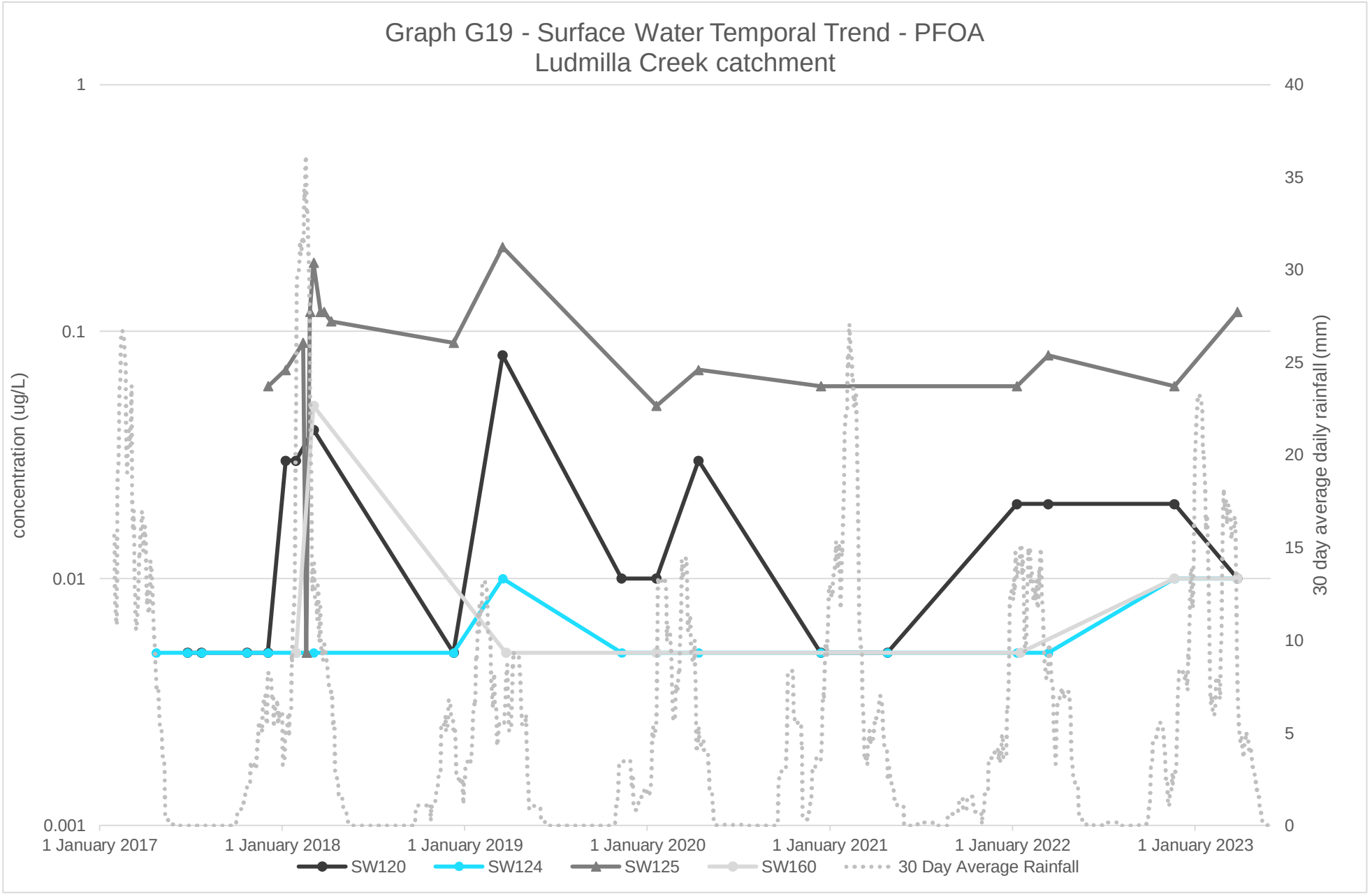

Graph G14 - Surface Water Temporal Trend - PFOS + PFHxS
Rapid Creek (estuarine water)
concentrations (ug/L)
10
1
0.1
0.01
30 day average daily rainfall (mm)
40
35
30
25
20
15
10
5
0
1 January 2017
1 January 2018
1 January 2019
1 January 2020
1 January 2021
1 January 2022
1 January 2023
SW112
SW113
30 Day Average Rainfall

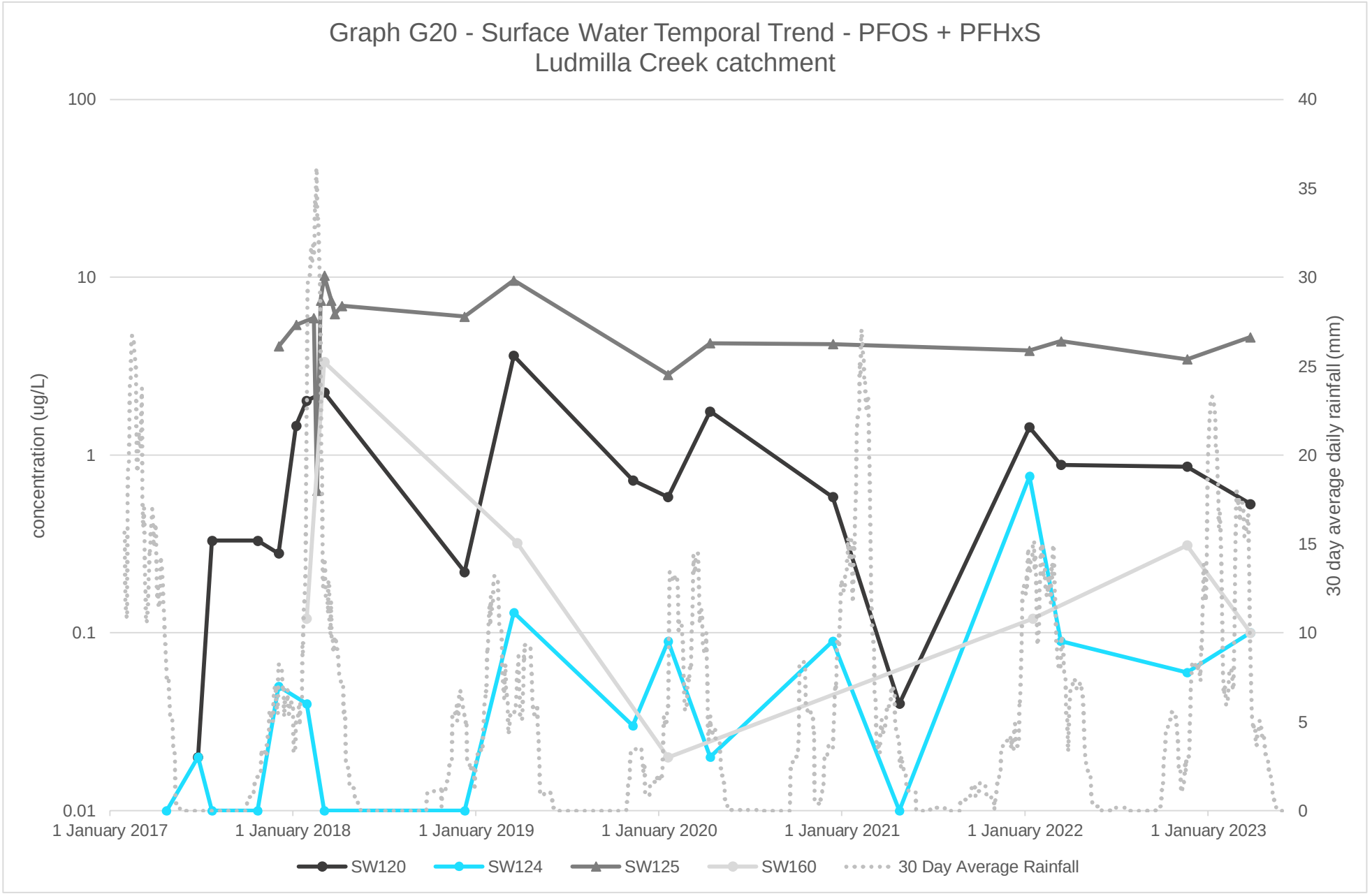

Graph G15 - Surface Water Temporal Trend - PFOA
Rapid Creek catchment (surface drains)
concentrations (ug/L)
30 day average daily rainfall (mm)
1
0.1
0.01
0.001
40
35
30
25
20
15
10
5
0
1 January 2017
1 January 2018
1 January 2019
1 January 2020
1 January 2021
1 January 2022
1 January 2023
SW114
SW115
SW168
30 Day Average Rainfall

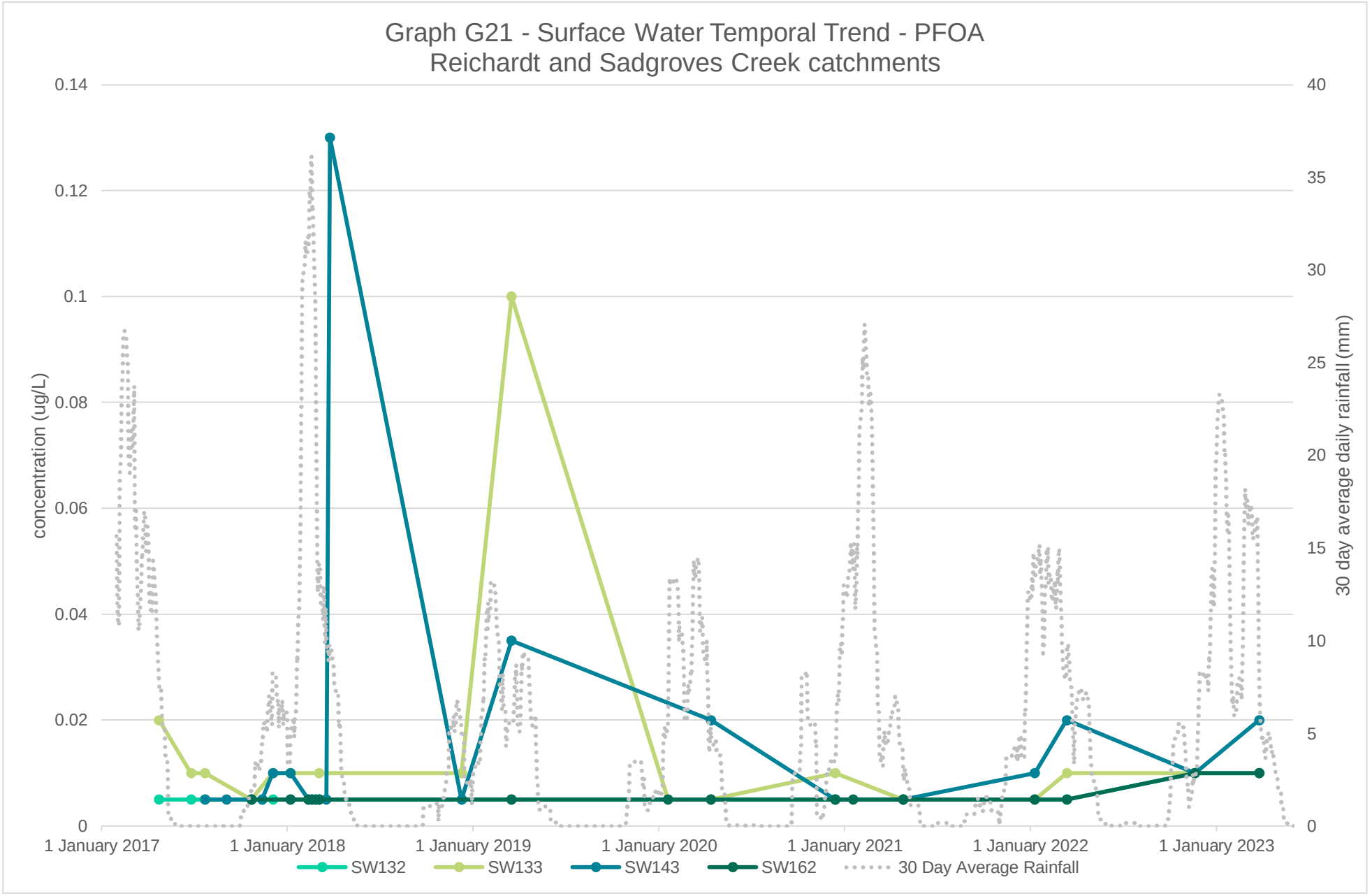

Graph G16 - Surface Water Temporal Trend - PFOS + PFHxS
Rapid Creek catchment (surface drains)
concentration (ug/L)
30 day average daily rainfall (mm)
10
1
0.1
0.01
40
35
30
25
20
15
10
5
0
1 January 2017
1 January 2018
1 January 2019
1 January 2020
1 January 2021
1 January 2022
1 January 2023
SW114
SW115
SW168
SW300
30 Day Average Rainfall

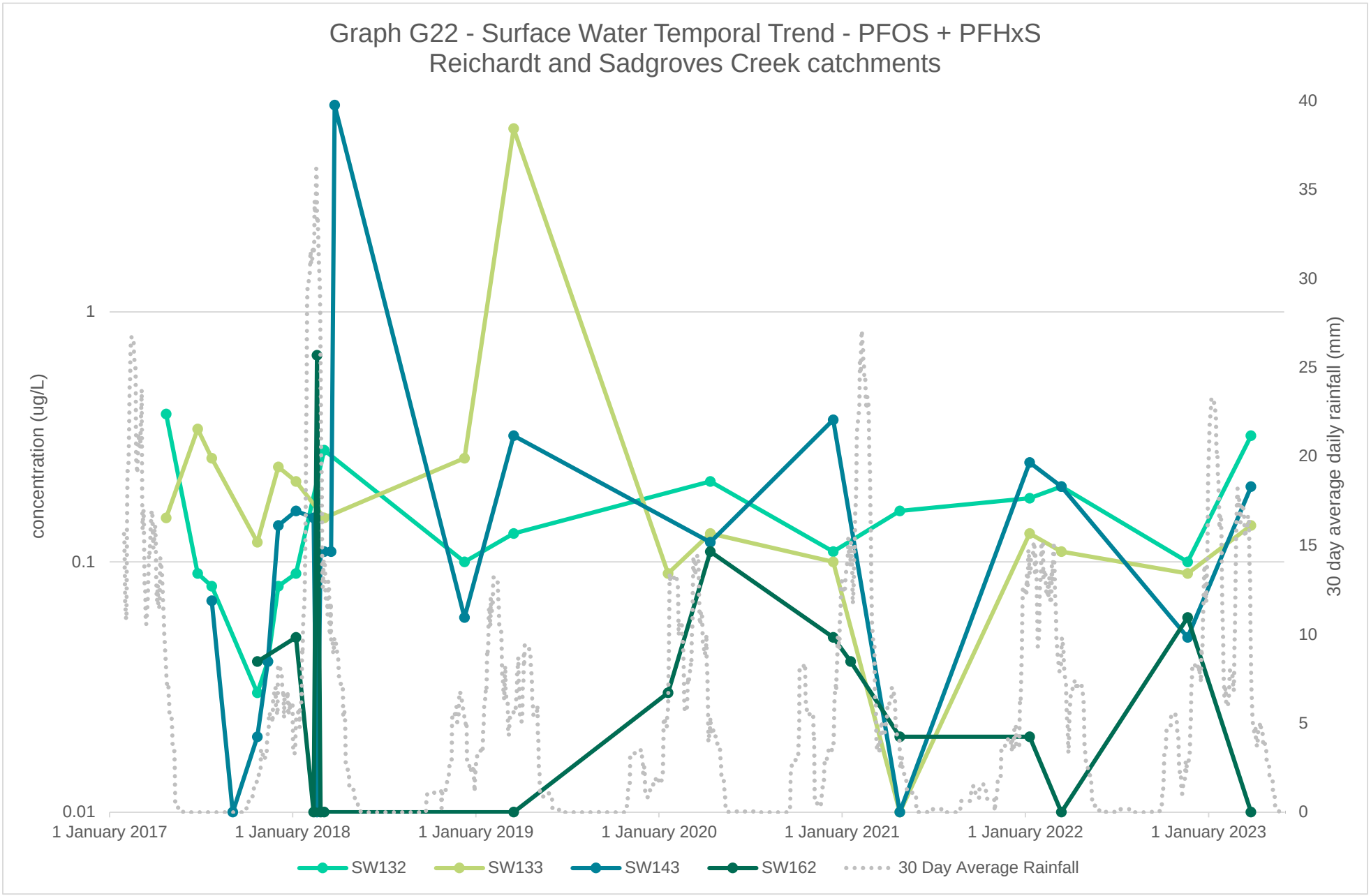

Graph G17 - Surface Water Temporal Trend - PFOA
Rapid Creek catchment (on-Site source areas)
concentration (ug/L)
1
0.1
0.01
0.001
30 day average daily rainfall (mm)
40
35
30
25
20
15
10
5
0
1 January 2017
1 January 2018
1 January 2019
1 January 2020
1 January 2021
1 January 2022
1 January 2023
SW156
SW170
SW178
SW181
SW312
30 Day Average Rainfall


Graph G18 - Surface Water Temporal Trend - PFOS + PFHxS
Rapid Creek catchment (on-Site source areas)
concentration (ug/L)
10
1
0.1
0.01
30 day average daily rainfall (mm)
40
35
30
25
20
15
10
5
0
1 January 2017
1 January 2018
1 January 2019
1 January 2020
1 January 2021
1 January 2022
1 January 2023
SW156
SW170
SW178
SW181
SW312
30 Day Average Rainfall


Graph G19 - Surface Water Temporal Trend - PFOA
Ludmilla Creek catchment
concentration (ug/L)
1
0.1
0.01
0.001
30 day average daily rainfall (mm)
40
35
30
25
20
15
10
5
0
1 January 2017
1 January 2018
1 January 2019
1 January 2020
1 January 2021
1 January 2022
1 January 2023
SW120
SW124
SW125
SW160
30 Day Average Rainfall


Graph G20 - Surface Water Temporal Trend - PFOS + PFHxS
Ludmilla Creek catchment
concentration (ug/L)
100
10
1
0.1
0.01
40
35
30
25
20
15
10
5
0
30 day average daily rainfall (mm)
1 January 2017
1 January 2018
1 January 2019
1 January 2020
1 January 2021
1 January 2022
1 January 2023
SW120
SW124
SW125
SW160
30 Day Average Rainfall


Graph G21 - Surface Water Temporal Trend - PFOA
Reichardt and Sadgroves Creek catchments
concentration (ug/L)
30 day average daily rainfall (mm)
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
40
35
30
25
20
15
10
5
0
1 January 2017
1 January 2018
1 January 2019
1 January 2020
1 January 2021
1 January 2022
1 January 2023
SW132
SW133
SW143
SW162
30 Day Average Rainfall


Graph G22 - Surface Water Temporal Trend - PFOS + PFHxS
Reichardt and Sadgroves Creek catchments
concentration (ug/L)
1
0.1
0.01
30 day average daily rainfall (mm)
40
35
30
25
20
15
10
5
0
1 January 2017
1 January 2018
1 January 2019
1 January 2020
1 January 2021
1 January 2022
1 January 2023
SW132
SW133
SW143
SW162
30 Day Average Rainfall

Appendix E

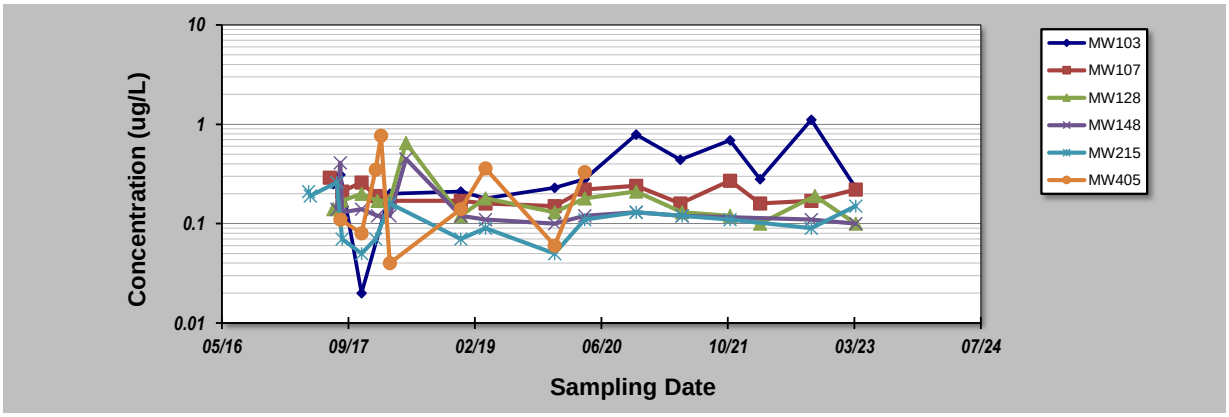
Mann-Kendall Analysis

AECOM

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	5-Jul-23	Job ID:	60612561
Facility Name:	RAAF Base Darwin - West	Constituent:	PFOA
Conducted By:	GF	Concentration Units:	ug/L

Sampling Point ID:		MW103	MW107	MW128	MW148	MW215	MW405	
Sampling Event	Sampling Date	PFOA CONCENTRATION (ug/L)						
1	Apr-17					0.21		
2	Apr-17					0.19		
3	Jul-17		0.29					
4	Jul-17	0.25		0.14				
5	Aug-17				0.14	0.26		
6	Aug-17	0.31			0.41		0.11	
7	Aug-17		0.21	0.17	0.13	0.07		
8	Nov-17	0.02	0.26	0.2	0.14	0.05	0.08	
9	Jan-18		0.19			0.07	0.35	
10	Jan-18			0.17	0.12			
11	Jan-18						0.77	
12	Mar-18	0.2	0.17	0.17	0.12	0.16	0.04	
13	May-18			0.65	0.45			
14	Dec-18	0.21	0.17	0.12	0.12	0.07	0.14	
15	Mar-19	0.18	0.16	0.18	0.11	0.09	0.36	
16	Dec-19	0.23	0.15	0.13	0.1	0.05	0.06	
17	Apr-20	0.28	0.22	0.18	0.12	0.11	0.33	
18	2-Nov-20	0.79	0.24	0.21	0.13	0.13		
19	26-Apr-21	0.44	0.16					
20	3-May-21			0.13	0.12	0.12		
21	8-Nov-21	0.69	0.27	0.12		0.11		
22	7-Mar-22	0.28	0.16	0.1				
23	26-Sep-22	1.11	0.17		0.11	0.09		
24	10-Oct-22			0.19				
25	20-Mar-23	0.23	0.22	0.1	0.1	0.15		
26								
27								
28								
29								
30								
Coefficient of Variation:		0.79	0.22	0.70	0.68	0.50	0.94	
Mann-Kendall Statistic (S):		35	-20	-27	-53	-8	2	
Confidence Factor:		96.9%	82.3%	87.7%	99.6%	62.2%	54.0%	
Concentration Trend:		Increasing	Stable	Stable	Decreasing	Stable	No Trend	



Notes:

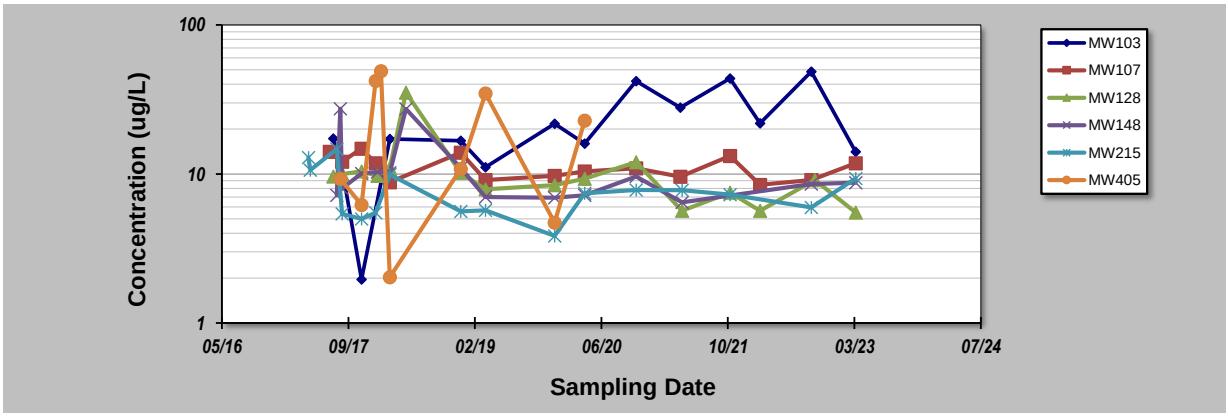
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

AECOM

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	5-Jul-23	Job ID:	60612561
Facility Name:	RAAF Base Darwin - West	Constituent:	Sum of PFHxS and PFOS
Conducted By:	GF	Concentration Units:	ug/L

Sampling Point ID:	MW103	MW107	MW128	MW148	MW215	MW405	
Sampling Event	Sampling Date	SUM OF PFHXS AND PFOS CONCENTRATION (ug/L)						
1	17-Apr-17					12.9		
2	24-Apr-17					10.6		
3	10-Jul-17		14.1					
4	24-Jul-17	17.3		9.6				
5	7-Aug-17				7.2	14.7		
6	21-Aug-17	12.7			27.4		9.3	
7	28-Aug-17		12.1	10	8	5.4		
8	13-Nov-17	1.96	14.8	10.4	10.1	5	6.2	
9	8-Jan-18		11.8			5.5	42.2	
10	15-Jan-18			9.7	10.3			
11	29-Jan-18						48.9	
12	5-Mar-18	17.2	8.8	11	10.2	9.9	2.03	
13	7-May-18			35.2	27.3			
14	10-Dec-18	16.7	13.9	10.2	11	5.6	10.8	
15	18-Mar-19	11.1	9.1	7.9	7	5.7	34.7	
16	16-Dec-19	21.7	9.71	8.41	6.94	3.84	4.72	
17	13-Apr-20	16	10.4	9.29	7.2	7.43	22.8	
18	2-Nov-20	42.00	11	12	9.62	7.82		
19	26-Apr-21	27.9	9.58					
20	3-May-21			5.67	6.45	7.78		
21	8-Nov-21	43.8	13.2	7.5		7.26		
22	7-Mar-22	21.9	8.46	5.66				
23	26-Sep-22	48.6	9.11		8.56	5.97		
24	10-Oct-22			9.11				
25	20-Mar-23	14.1	11.8	5.52	8.74	9.32		
26								
27								
28								
29								
30								
Coefficient of Variation:		0.61	0.19	0.66	0.61	0.39	0.88	
Mann-Kendall Statistic (S):		35	-32	-52	-24	-6	0	
Confidence Factor:		96.9%	93.7%	99.0%	87.0%	58.8%	46.0%	
Concentration Trend:		Increasing	Prob. Decreasing	Decreasing	Stable	Stable	Stable	



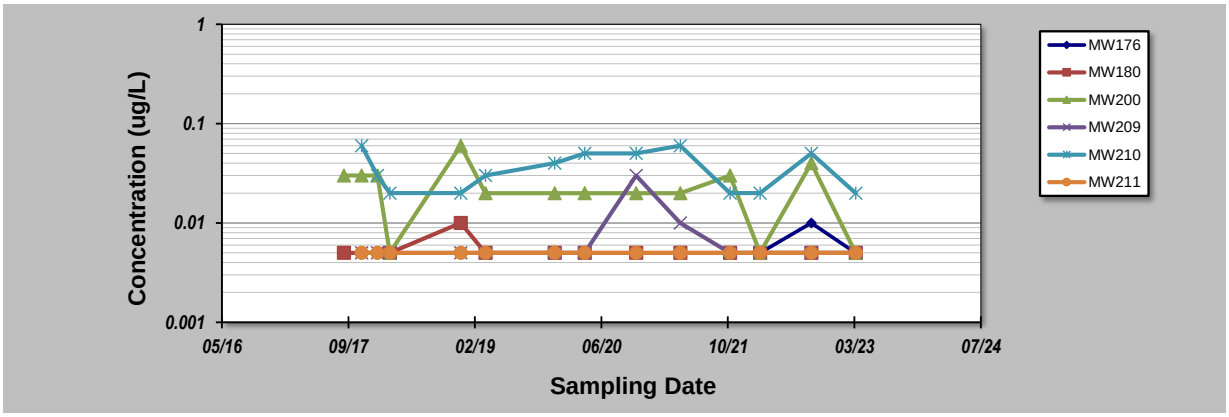
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	5-Jul-23	Job ID:	60612561
Facility Name:	RAAF Base Darwin - south & west	Constituent:	PFOA
Conducted By:	GF	Concentration Units:	ug/L

Sampling Point ID:	MW176	MW180	MW200	MW209	MW210	MW211	
Sampling Event	Sampling Date	PFOA CONCENTRATION (ug/L)						
1	4-Sep-17	0.005	0.005	0.03				
2	13-Nov-17			0.03	0.005	0.06	0.005	
3	15-Jan-18			0.03	0.005	0.03	0.005	
4	5-Mar-18	0.005	0.005	0.005	0.005	0.02	0.005	
5	10-Dec-18		0.01	0.06	0.005	0.02	0.005	
6	18-Mar-19	0.005	0.005	0.02	0.005	0.03	0.005	
7	16-Dec-19		0.005	0.02	0.005	0.04	0.005	
8	13-Apr-20		0.005	0.02	0.005	0.05	0.005	
9	2-Nov-20	0.005	0.005	0.02	0.03	0.05	0.005	
10	26-Apr-21	0.005	0.005	0.02	0.01	0.06	0.005	
11	8-Nov-21	0.005	0.005	0.03	0.005	0.02	0.005	
12	7-Mar-22	0.005	0.005	0.005	0.005	0.02	0.005	
13	26-Sep-22	0.01	0.005	0.04	0.005	0.05	0.005	
14	20-Mar-23	0.005	0.005	0.005	0.005	0.02	0.005	
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.30	0.27	0.62	0.95	0.45	0.00	
Mann-Kendall Statistic (S):		6	-7	-20	5	-3	0	
Confidence Factor:		69.4%	65.6%	84.8%	59.4%	54.8%	47.6%	
Concentration Trend:		No Trend	Stable	Stable	No Trend	Stable	Stable	



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water* , 41(3):355-367, 2003.

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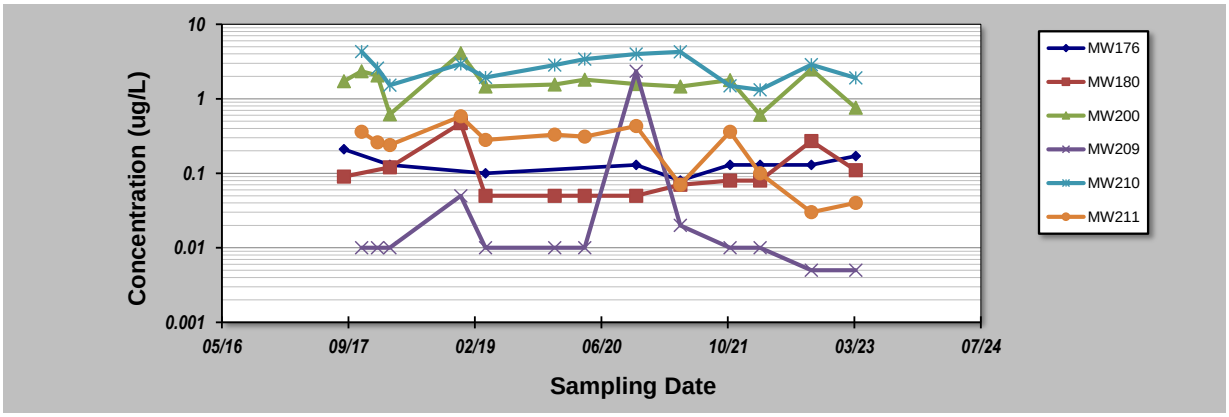
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	5-Jul-23	Job ID:	60612561
Facility Name:	RAAF Base Darwin - Source Area 2	Constituent:	Sum of PFHxS and PFOS
Conducted By:	GF	Concentration Units:	ug/L

Sampling Point ID:	MW176	MW180	MW200	MW209	MW210	MW211	
Sampling Event	Sampling Date	SUM OF PFHXS AND PFOS CONCENTRATION (ug/L)						
1	4-Sep-17	0.21	0.09	1.72				
2	13-Nov-17			2.34	0.01	4.31	0.36	
3	15-Jan-18			2.05	0.01	2.58	0.26	
4	5-Mar-18	0.13	0.12	0.62	0.01	1.52	0.24	
5	10-Dec-18		0.47	4.1	0.05	2.93	0.58	
6	18-Mar-19	0.1	0.05	1.46	0.01	1.93	0.28	
7	16-Dec-19		0.05	1.55	0.01	2.83	0.33	
8	13-Apr-20		0.05	1.81	0.01	3.4	0.31	
9	2-Nov-20	0.13	0.05	1.57	2.34	3.99	0.43	
10	26-Apr-21	0.08	0.07	1.46	0.02	4.28	0.07	
11	8-Nov-21	0.13	0.08	1.78	0.01	1.49	0.36	
12	7-Mar-22	0.13	0.08	0.61	0.01	1.32	0.1	
13	26-Sep-22	0.13	0.27	2.49	0.005	2.87	0.03	
14	20-Mar-23	0.17	0.11	0.76	0.005	1.91	0.04	
15								
16								
17								
18								
19								
20								
Coefficient of Variation:		0.28	1.00	0.51	3.36	0.39	0.63	
Mann-Kendall Statistic (S):		2	9	-18	-17	-12	-27	
Confidence Factor:		54.0%	70.4%	82.1%	83.2%	74.5%	94.3%	
Concentration Trend:		No Trend	No Trend	Stable	No Trend	Stable	Prob. Decreasing	



Notes:

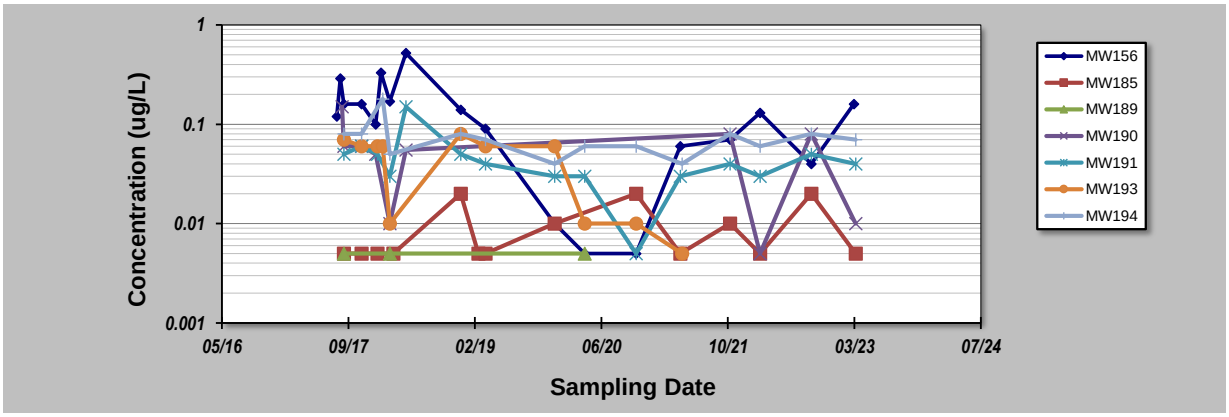
1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

AECOM

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	5-Jul-23	Job ID:	60612561
Facility Name:	RAAF Base Darwin - North (1 of 2)	Constituent:	PFOA
Conducted By:	GF	Concentration Units:	ug/L

Sampling Point ID:	MW156	MW185	MW189	MW190	MW191	MW193	MW194
Sampling Event	Sampling Date	PFOA CONCENTRATION (ug/L)						
1	24/04/2017							
2	7/08/2017	0.12						
3	21/08/2017	0.29						
4	28/08/2017				0.15			
5	4/09/2017	0.16	0.005	0.005	0.06	0.05	0.07	0.08
6	13/11/2017	0.16	0.005		0.06	0.06	0.06	0.08
7	8/01/2018	0.1			0.05			
8	15/01/2018		0.005			0.05	0.06	
9	29/01/2018	0.33						
10	5/02/2018						0.06	0.18
11	5/03/2018	0.17		0.005	0.01	0.03	0.01	0.05
12	19/03/2018		0.005					
13	7/05/2018	0.52			0.055	0.15		
14	10/12/2018	0.14	0.02			0.05	0.08	0.08
15	18/02/2019		0.005					
16	18/03/2019	0.09	0.005			0.04	0.06	0.07
17	16/12/2019	0.01	0.01			0.03	0.06	0.04
18	13/04/2020	0.005		0.005		0.03	0.01	0.06
19	2/11/2020	0.005	0.02			0.005	0.01	0.06
20	26/04/2021	0.06	0.005			0.03		
21	3-May-21						0.005	0.04
22	8-Nov-21	0.07	0.01		0.08	0.04		0.08
23	7-Mar-22	0.13	0.005		0.005	0.03		0.06
24	26-Sep-22	0.04	0.02		0.08	0.05		0.08
25	13-Mar-23	0.16						
26	20-Mar-23		0.005		0.01	0.04		0.07
27								
28								
29								
30								
Coefficient of Variation:		0.91	0.70	0.00	0.77	0.70	0.65	0.46
Mann-Kendall Statistic (S):		-49	17	0	-14	-30	-28	-16
Confidence Factor:		96.6%	80.6%		87.3%	92.3%	98.4%	79.1%
Concentration Trend:		Decreasing	No Trend		Stable	Prob. Decreasing	Decreasing	Stable



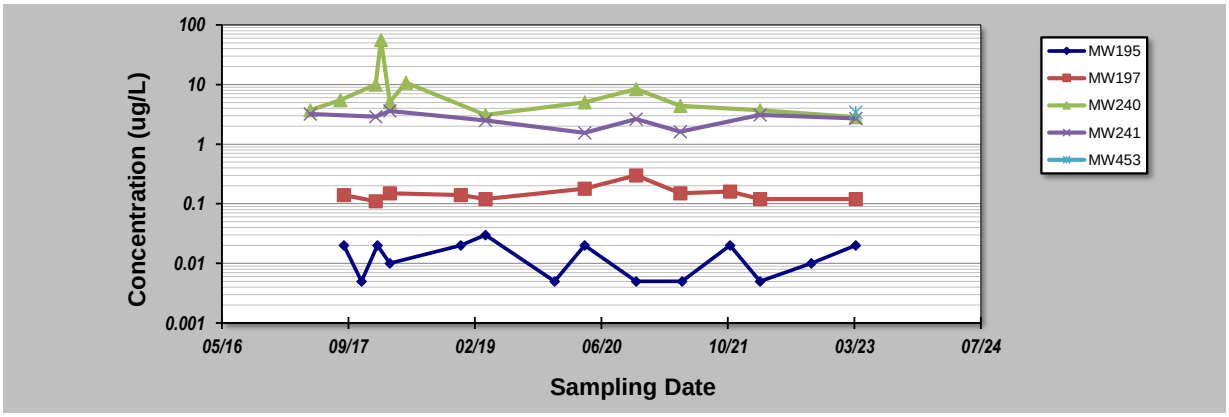
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	5-Jul-23	Job ID:	60612561
Facility Name:	RAAF Base Darwin - North (2 of 2)	Constituent:	PFOA
Conducted By:	GF	Concentration Units:	ug/L

Sampling Point ID:	MW195	MW197	MW240	MW241	MW453		
Sampling Event	Sampling Date	PFOA CONCENTRATION (ug/L)						
1	24/04/2017			3.7	3.2			
2	7/08/2017							
3	21/08/2017			5.5				
4	28/08/2017							
5	4/09/2017	0.02	0.14					
6	13/11/2017	0.005						
7	8/01/2018		0.11	10	2.9			
8	15/01/2018	0.02						
9	29/01/2018			56				
10	5/02/2018							
11	5/03/2018	0.01	0.15	5.1	3.6			
12	19/03/2018							
13	7/05/2018			10.8				
14	10/12/2018	0.02	0.14					
15	18/02/2019							
16	18/03/2019	0.03	0.12	3.1	2.5			
17	16/12/2019	0.005						
18	13/04/2020	0.02	0.18	5.05	1.55			
19	2/11/2020	0.005	0.3	8.4	2.63			
20	26/04/2021		0.15	4.41	1.62			
21	3-May-21	0.005						
22	8-Nov-21	0.02	0.16					
23	7-Mar-22	0.005	0.12	3.71	3.1			
24	26-Sep-22	0.01						
25	13-Mar-23							
26	20-Mar-23	0.02	0.12	2.85	2.7	3.42		
27								
28								
29								
30								
Coefficient of Variation:		0.60	0.34	1.49	0.26			
Mann-Kendall Statistic (S):		-7	4	-22	-8			
Confidence Factor:		62.6%	59.0%	92.4%	76.2%			
Concentration Trend:		Stable	No Trend	Prob. Decreasing	Stable			



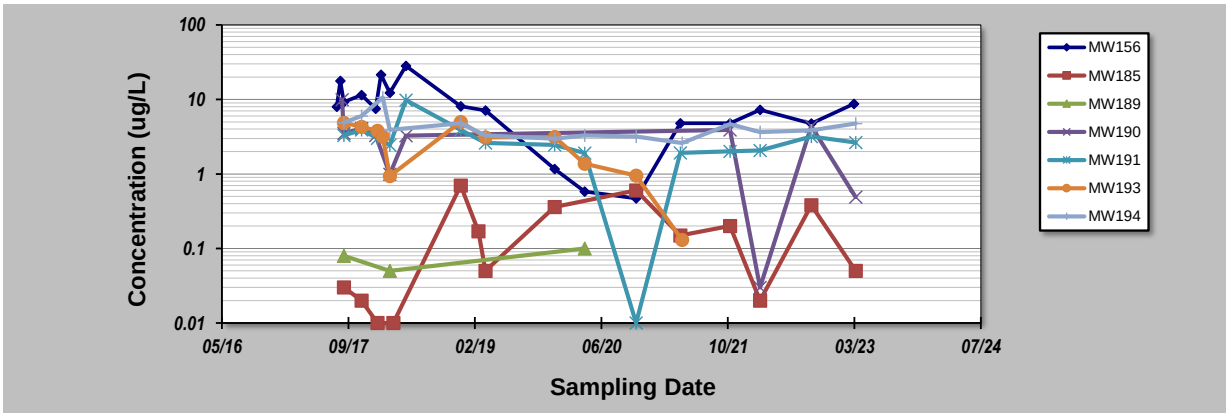
Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	5-Jul-23	Job ID:	60612561
Facility Name:	RAAF Base Darwin - North (1 of 2)	Constituent:	Sum of PFHxS and PFOS
Conducted By:	GF	Concentration Units:	ug/L

Sampling Point ID:		MW156	MW185	MW189	MW190	MW191	MW193	MW194
Sampling Event	Sampling Date	SUM OF PFHXS AND PFOS CONCENTRATION (ug/L)						
1	24-Apr-17							
2	7-Aug-17	8						
3	21-Aug-17	17.7						
4	28-Aug-17				9.96			
5	4-Sep-17	9.2	0.03	0.08	3.5	3.3	4.86	4.9
6	13-Nov-17	11.5	0.02		4.1	3.9	4.3	6
7	8-Jan-18	7.5			3.3			
8	15-Jan-18		0.01			3.02	3.8	
9	29-Jan-18	21.5						
10	5-Feb-18						3.18	10.63
11	5-Mar-18	12.30		0.05	0.99	2.43	0.94	3.91
12	19-Mar-18		0.01					
13	7-May-18	28.20			3.27	9.8		
14	10-Dec-18	8.10	0.7			3.9	5	4.8
15	18-Feb-19		0.17					
16	18-Mar-19	7.10	0.05			2.61	3.1	3.3
17	16-Dec-19	1.17	0.36			2.46	3.13	2.96
18	13-Apr-20	0.58		0.1		1.91	1.37	3.3
19	2-Nov-20	0.47	0.6			0.01	0.95	3.19
20	26-Apr-21	4.78	0.15			1.92		
21	3-May-21						0.13	2.6
22	8-Nov-21	4.79	0.2		3.9	2.01		4.65
23	7-Mar-22	7.26	0.02		0.03	2.07		3.64
24	26-Sep-22	4.76	0.38		4.39	3.18		3.84
25	13-Mar-23	8.72						
26	20-Mar-23		0.05		0.49	2.65		4.75
27								
28								
29								
30								
Coefficient of Variation:		0.79	1.17	0.33	0.82	0.70	0.61	0.45
Mann-Kendall Statistic (S):		-55	20	1	-17	-32	-35	-26
Confidence Factor:		98.0%	84.8%		92.2%	93.7%	99.7%	91.3%
Concentration Trend:		Decreasing	No Trend		Prob. Decreasing	Prob. Decreasing	Decreasing	Prob. Decreasing



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
2. Confidence in Trend = Confidence (in percent) that constituent concentration is increasing (S>0) or decreasing (S<0): >95% = Increasing or Decreasing; ≥ 90% = Probably Increasing or Probably Decreasing; < 90% and S>0 = No Trend; < 90%, S≤0, and COV ≥ 1 = No Trend; < 90% and COV < 1 = Stable.
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

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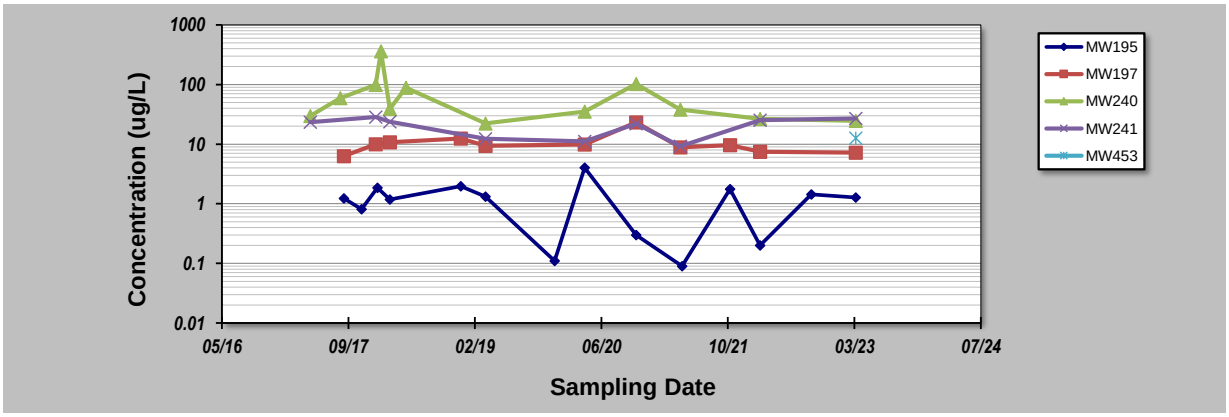
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	5-Jul-23	**Job ID:**	60612561
Facility Name:	RAAF Base Darwin - North (2 of 2)	**Constituent:**	Sum of PFHxS and PFOS
Conducted By:	GF	**Concentration Units:**	ug/L

Sampling Point ID:	MW195	MW197	MW240	MW241	MW453		
Sampling Event	**Sampling Date**	**SUM OF PFHXS AND PFOS CONCENTRATION (ug/L)**						
1	24-Apr-17			29.7	23.3			
2	7-Aug-17							
3	21-Aug-17			59				
4	28-Aug-17							
5	4-Sep-17	1.23	6.3					
6	13-Nov-17	0.81						
7	8-Jan-18		10	99	28.5			
8	15-Jan-18	1.86						
9	29-Jan-18			360				
10	5-Feb-18							
11	5-Mar-18	1.18	11	39	23.7			
12	19-Mar-18							
13	7-May-18			88.7				
14	10-Dec-18	1.97	12					
15	18-Feb-19							
16	18-Mar-19	1.32	9	22.3	12.3			
17	16-Dec-19	0.11						
18	13-Apr-20	4.02	10	35.1	11.1			
19	2-Nov-20	0.3	23.2	102	22			
20	26-Apr-21		8.84	38.1	9.2			
21	3-May-21	0.09						
22	8-Nov-21	1.77	9.61					
23	7-Mar-22	0.2	7.48	26.5	25.3			
24	26-Sep-22	1.44						
25	13-Mar-23							
26	20-Mar-23	1.27	7.2	24.7	27	12.6		
27								
28								
29								
30								
Coefficient of Variation:		0.82	0.44	1.22	0.36			
Mann-Kendall Statistic (S):		-7	-13	-18	-2			
Confidence Factor:		62.6%	82.1%	87.5%	54.0%			
Concentration Trend:		Stable	Stable	No Trend	Stable			



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
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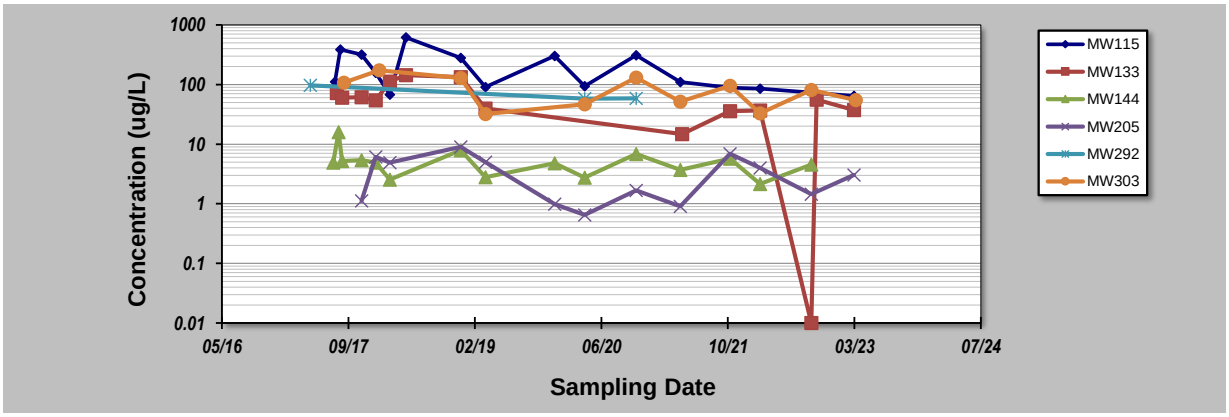
3. Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.

GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	5-Jul-23	Job ID:	60612562
Facility Name:	RAAF Base Darwin - Central	Constituent:	PFOA
Conducted By:	GF	Concentration Units:	ug/L

Sampling Point ID:	MW115	MW133	MW144	MW205	MW292	MW303	
Sampling Event	Sampling Date	PFOA CONCENTRATION (ug/L)						
1	24/04/2017					97		
2	24/07/2017			4.9				
3	31/07/2017	111						
4	7/08/2017		72					
5	14/08/2017			15.9				
6	21/08/2017	386						
7	28/08/2017		60	5.2				
8	4/09/2017						108	
9	13/11/2017	317	61.4	5.4	1.12			
10	8/01/2018	158	54.3	4.9	6.1			
11	22/01/2018						173	
12	5/03/2018	68	112	2.55	4.9			
13	7/05/2018	616	143.9					
14	10/12/2018	279	133	7.9	9		129	
15	18/03/2019	91	39.8	2.8	5		32	
16	16/12/2019	301		4.8	0.99			
17	13/04/2020	93.8		2.75	0.65	58	46.7	
18	2/11/2020	309		6.87	1.67	58.9	131	
19	26/04/2021	110		3.69	0.91		51.8	
20	3/05/2021		14.8					
21	8/11/2021	88.6	35.7	5.71	6.88		95.6	
22	7/03/2022	85.2	36.7	2.15	4.01		32.9	
23	26/09/2022		0.01	4.55	1.45		81.3	
24	17/10/2022		56					
25	13/03/2023	64.5	37.4		3.04			
26	20/03/2023						54.9	
27								
28								
29								
30								
Coefficient of Variation:		0.77	0.69	0.62	0.77	0.31	0.54	
Mann-Kendall Statistic (S):		-43	-35	-28	-10	-1	-13	
Confidence Factor:		98.2%	96.9%	90.8%	70.5%		82.1%	
Concentration Trend:		Decreasing	Decreasing	Prob. Decreasing	Stable		Stable	



Notes:

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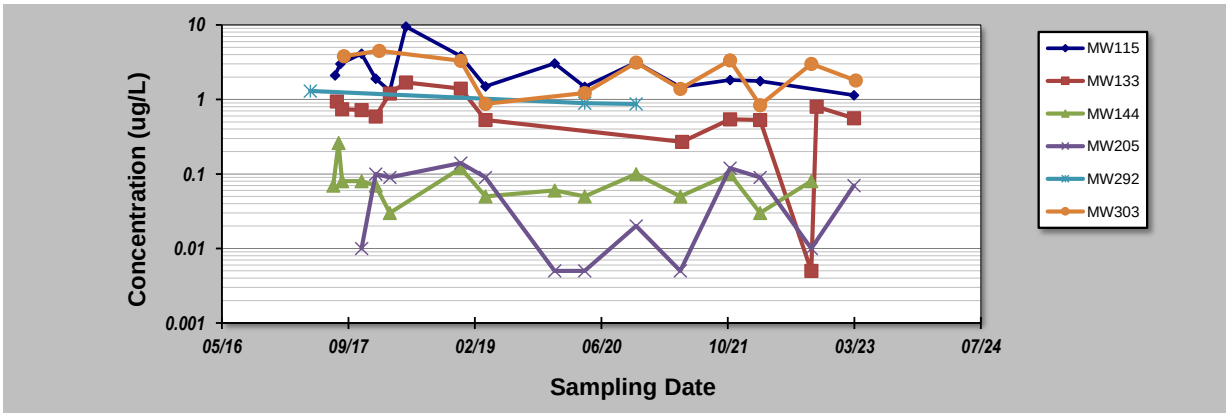
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	5-Jul-23	Job ID:	60612561
Facility Name:	RAAF Base Darwin - Central	Constituent:	Sum of PFHxS and PFOS
Conducted By:	GF	Concentration Units:	ug/L

Sampling Point ID:	MW115	MW133	MW144	MW205	MW292	MW303	
Sampling Event	Sampling Date	SUM OF PFHXS AND PFOS CONCENTRATION (ug/L)						
1	24/04/2017					1.3		
2	24/07/2017			0.07				
3	31/07/2017	2.1						
4	7/08/2017		0.94					
5	14/08/2017			0.26				
6	21/08/2017	3						
7	28/08/2017		0.74	0.08				
8	4/09/2017						3.8	
9	13/11/2017	4.1	0.72	0.08	0.01			
10	8/01/2018	1.9	0.59	0.07	0.1			
11	22/01/2018						4.5	
12	5/03/2018	1.3	1.2	0.03	0.09			
13	7/05/2018	9.5	1.69					
14	10/12/2018	3.8	1.4	0.12	0.14		3.3	
15	18/03/2019	1.5	0.53	0.05	0.09		0.87	
16	16/12/2019	3.05		0.06	0.005			
17	13/04/2020	1.48		0.05	0.005	0.89	1.22	
18	2/11/2020	3.15		0.1	0.02	0.87	3.12	
19	26/04/2021	1.47		0.05	0.005		1.39	
20	3/05/2021		0.27					
21	8/11/2021	1.82	0.54	0.1	0.12		3.34	
22	7/03/2022	1.76	0.53	0.03	0.09		0.84	
23	26/09/2022		0.005	0.08	0.01		3	
24	17/10/2022		0.8					
25	13/03/2023	1.14	0.56		0.07			
26	20/03/2023						1.8	
27								
28								
29								
30								
Coefficient of Variation:		0.76	0.59	0.68	0.86	0.24	0.52	
Mann-Kendall Statistic (S):		-35	-30	-20	-9	-3	-17	
Confidence Factor:		95.4%	94.4%	82.3%	68.4%		89.1%	
Concentration Trend:		Decreasing	Prob. Decreasing	Stable	Stable		Stable	



Notes:

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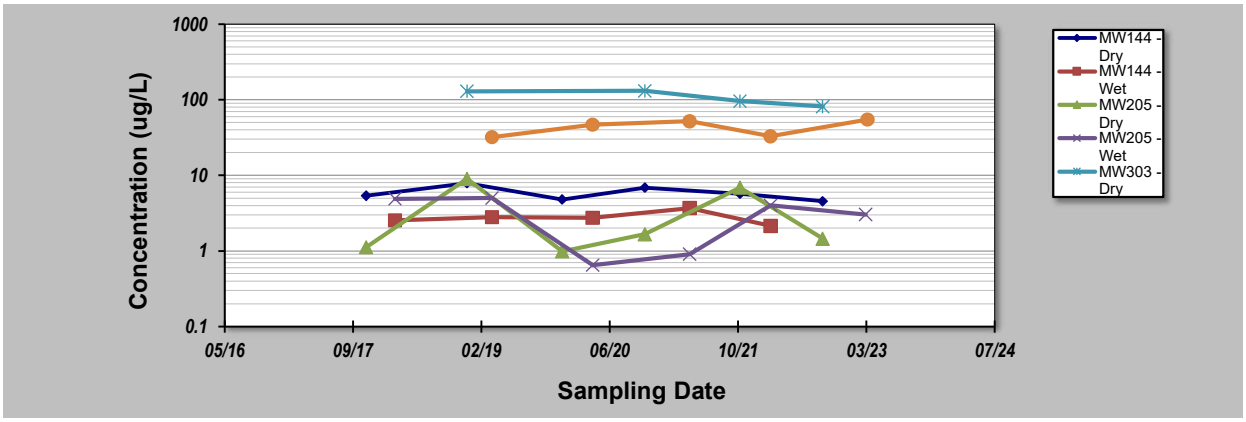
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	21-Jul-23	Job ID:	60612562
Facility Name:	RAAF Base Darwin - Central	Constituent:	PFOA - seasonally filtered
Conducted By:	DDT	Concentration Units:	ug/L

Sampling Point ID:		MW144 - Dry	MW144 - Wet	MW205 - Dry	MW205 - Wet	MW303 - Dry	MW303 - Wet	
Sampling Event	Sampling Date	PFOA - SEASONALLY FILTERED CONCENTRATION (ug/L)						
1	24/04/2017							
2	24/07/2017							
3	31/07/2017							
4	7/08/2017							
5	14/08/2017							
6	21/08/2017							
7	28/08/2017							
8	4/09/2017							
9	13/11/2017	5.4		1.12				
10	8/01/2018							
11	22/01/2018							
12	5/03/2018		2.55		4.9			
13	7/05/2018							
14	10/12/2018	7.9		9		129		
15	18/03/2019		2.8		5		32	
16	16/12/2019	4.8		0.99				
17	13/04/2020		2.75		0.65		46.7	
18	2/11/2020	6.87		1.67		131		
19	26/04/2021		3.69		0.91		51.8	
20	3/05/2021							
21	8/11/2021	5.71		6.88		95.6		
22	7/03/2022		2.15		4.01		32.9	
23	26/09/2022	4.55		1.45		81.3		
24	17/10/2022							
25	13/03/2023				3.04			
26	20/03/2023						54.9	
27								
28								
29								
30								
Coefficient of Variation:		0.22	0.20	0.99	0.62	0.23	0.24	
Mann-Kendall Statistic (S):		-5	0	1	-3	-4	6	
Confidence Factor:		76.5%	40.8%	50.0%	64.0%	83.3%	88.3%	
Concentration Trend:		Stable	Stable	No Trend	Stable	Stable	No Trend	



Notes:

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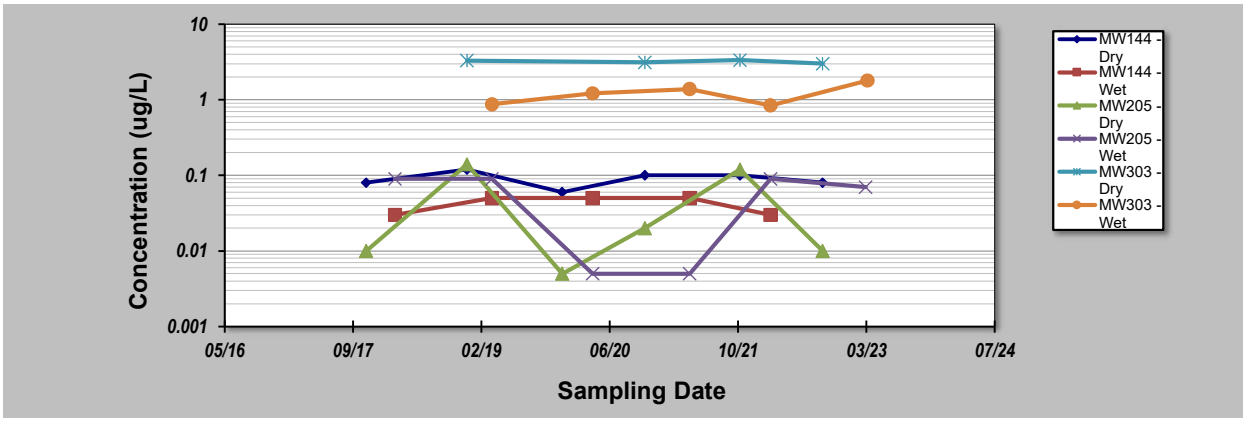
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	21-Jul-23	Job ID:	60612561
Facility Name:	RAAF Base Darwin - Central	Constituent:	PFOS+PFHxS - seasonally filtered
Conducted By:	DDT	Concentration Units:	ug/L

Sampling Point ID:		MW144 - Dry	MW144 - Wet	MW205 - Dry	MW205 - Wet	MW303 - Dry	MW303 - Wet	
Sampling Event	Sampling Date	PFOS+PFHXS - SEASONALLY FILTERED CONCENTRATION (ug/L)						
1	24/04/2017							
2	24/07/2017							
3	31/07/2017							
4	7/08/2017							
5	14/08/2017							
6	21/08/2017							
7	28/08/2017							
8	4/09/2017							
9	13/11/2017	0.08		0.01				
10	8/01/2018							
11	22/01/2018							
12	5/03/2018		0.03		0.09			
13	7/05/2018							
14	10/12/2018	0.12		0.14		3.3		
15	18/03/2019		0.05		0.09		0.87	
16	16/12/2019	0.06		0.005				
17	13/04/2020		0.05		0.005		1.22	
18	2/11/2020	0.1		0.02		3.12		
19	26/04/2021		0.05		0.005		1.39	
20	3/05/2021							
21	8/11/2021	0.1		0.12		3.34		
22	7/03/2022		0.03		0.09		0.84	
23	26/09/2022	0.08		0.01		3		
24	17/10/2022							
25	13/03/2023				0.07			
26	20/03/2023						1.8	
27								
28								
29								
30								
Coefficient of Variation:		0.23	0.26	1.22	0.72	0.05	0.32	
Mann-Kendall Statistic (S):		-1	0	0	-3	-2	4	
Confidence Factor:		50.0%	40.8%	39.3%	64.0%	62.5%	75.8%	
Concentration Trend:		Stable	Stable	No Trend	Stable	Stable	No Trend	



Notes:

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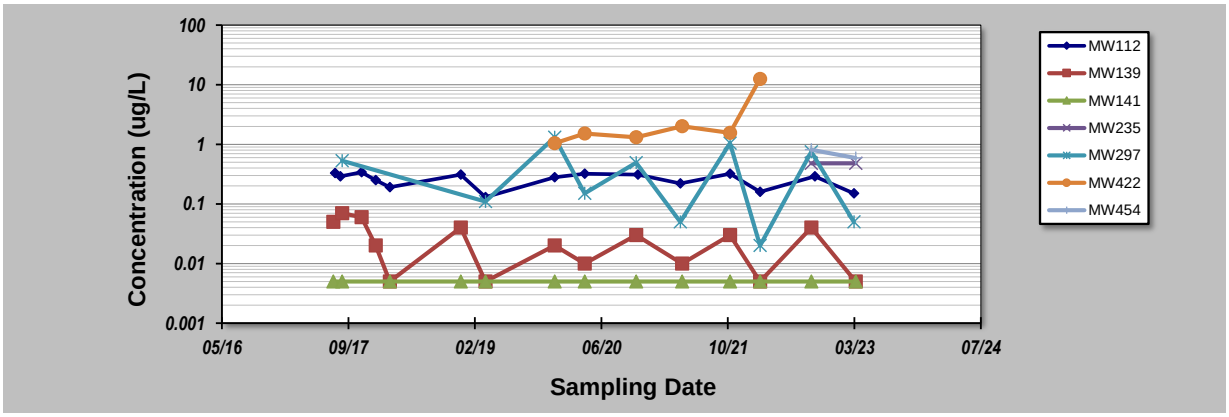
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	5-Jul-23	Job ID:	60612561
Facility Name:	RAAF Base Darwin - South East	Constituent:	PFOA
Conducted By:	GF	Concentration Units:	ug/L

Sampling Point ID:	MW112	MW139	MW141	MW235	MW297	MW422	MW454
Sampling Event	Sampling Date	PFOA CONCENTRATION (ug/L)						
1	24-Jul-17		0.05	0.005				
2	31-Jul-17	0.33						
3	21-Aug-17	0.29						
4	28-Aug-17		0.07	0.005		0.53		
5	13-Nov-17	0.34	0.06					
6	8-Jan-18	0.25	0.02					
7	5-Mar-18	0.19	0.005	0.005				
8	10-Dec-18	0.31	0.04	0.005				
9	18-Mar-19	0.13	0.005	0.005		0.11		
10	16-Dec-19	0.28	0.02	0.005		1.31	1.04	
11	13-Apr-20	0.32	0.01	0.005		0.15	1.51	
12	2-Nov-20		0.03	0.005		0.49	1.31	
13	9-Nov-20	0.31						
14	26-Apr-21	0.22				0.05		
15	3-May-21		0.01	0.005			2.01	
16	8-Nov-21	0.32	0.03	0.005		1.04	1.56	
17	7-Mar-22	0.16	0.005	0.005		0.02	12.5	
18	26-Sep-22		0.04	0.005	0.48	0.75		0.81
19	10-Oct-22	0.29						
20	13-Mar-23	0.15				0.05		
21	20-Mar-23		0.005	0.005	0.48			0.59
22								
23								
24								
25								
Coefficient of Variation:		0.28	0.80	0.00	0.00	1.02	1.36	0.22
Mann-Kendall Statistic (S):		-28	-35	0	0	-10	11	-1
Confidence Factor:		90.8%	95.4%	47.6%		78.4%	97.2%	
Concentration Trend:		Prob. Decreasing	Decreasing	Stable		No Trend	Increasing	



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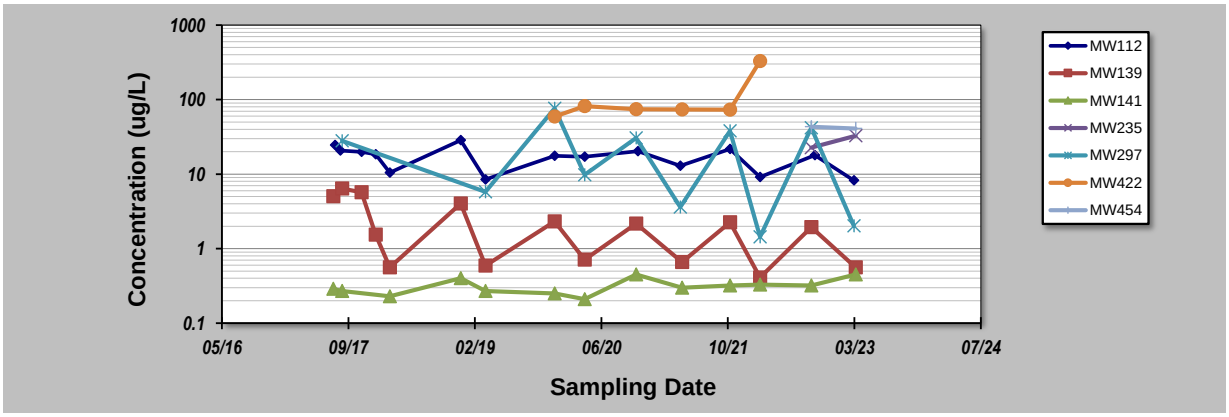
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	5-Jul-23	Job ID:	60612561
Facility Name:	RAAF Base Darwin - South East	Constituent:	Sum of PFHxS and PFOS
Conducted By:	GF	Concentration Units:	ug/L

Sampling Point ID:	MW112	MW139	MW141	MW235	MW297	MW422	MW454
Sampling Event	Sampling Date	SUM OF PFHXS AND PFOS CONCENTRATION (ug/L)						
1	24-Jul-17		5.06	0.29				
2	31-Jul-17	24.5						
3	21-Aug-17	20.7						
4	28-Aug-17		6.4	0.27		28		
5	13-Nov-17	19.9	5.7					
6	8-Jan-18	18.4	1.54					
7	5-Mar-18	10.5	0.56	0.23				
8	10-Dec-18	28.5	4.02	0.4				
9	18-Mar-19	8.5	0.59	0.27		5.8		
10	16-Dec-19	17.6	2.31	0.25		76.3	59.2	
11	13-Apr-20	17.1	0.71	0.21		9.78	81.6	
12	2-Nov-20		2.17	0.45		30.6	74.3	
13	9-Nov-20	20.3						
14	26-Apr-21	12.9				3.6		
15	3-May-21		0.66	0.3			73.8	
16	8-Nov-21	21.8	2.26	0.32		38.1	73	
17	7-Mar-22	9.14	0.41	0.33		1.44	328	
18	26-Sep-22		2	0.32	22.7	41.8		43.2
19	10-Oct-22	17.9						
20	13-Mar-23	8.23				2.02		
21	20-Mar-23		0.56	0.45	32.7			40.9
22								
23								
24								
25								
Coefficient of Variation:		0.36	0.87	0.25	0.26	1.02	0.91	0.04
Mann-Kendall Statistic (S):		-39	-46	27	1	-7	3	-1
Confidence Factor:		97.1%	98.8%	94.3%		70.0%	64.0%	
Concentration Trend:		Decreasing	Decreasing	Prob. Increasing		No Trend	No Trend	



Notes:

1. At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
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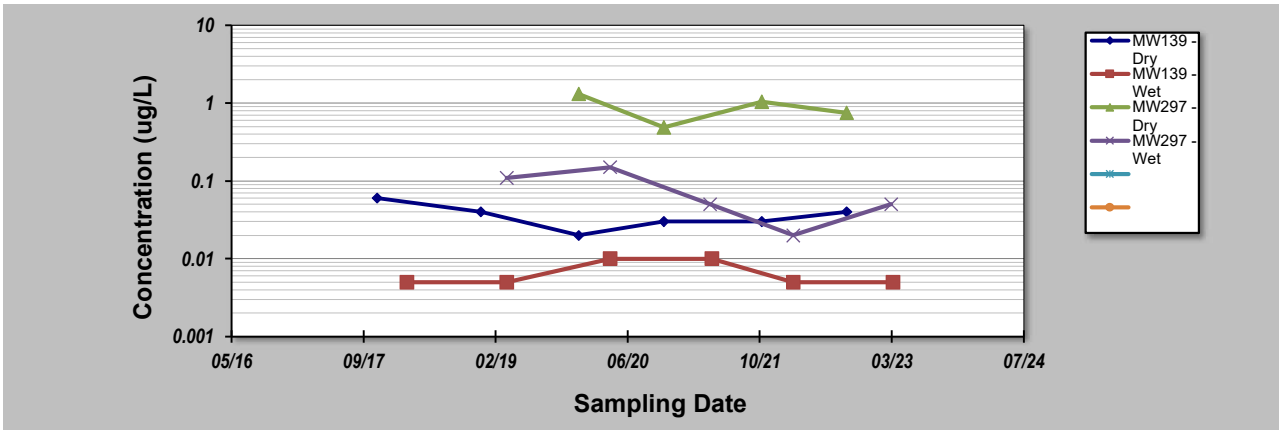
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	21-Jul-23	Job ID:	60612561
Facility Name:	RAAF Base Darwin - South East	Constituent:	PFOA - seasonally filtered
Conducted By:	DDT	Concentration Units:	ug/L

Sampling Point ID:	MW139 - Dry	MW139 - Wet	MW297 - Dry	MW297 - Wet			
Sampling Event	Sampling Date	PFOA - SEASONALLY FILTERED CONCENTRATION (ug/L)						
1								
2								
3								
4								
5	13-Nov-17	0.06						
6	8-Jan-18							
7	5-Mar-18		0.005					
8	10-Dec-18	0.04						
9	18-Mar-19		0.005		0.11			
10	16-Dec-19	0.02		1.31				
11	13-Apr-20		0.01		0.15			
12	2-Nov-20	0.03		0.49				
13	9-Nov-20							
14	26-Apr-21				0.05			
15	3-May-21		0.01					
16	8-Nov-21	0.03		1.04				
17	7-Mar-22		0.005		0.02			
18	26-Sep-22	0.04		0.75				
19	10-Oct-22							
20	13-Mar-23				0.05			
21	20-Mar-23		0.005					
22								
23								
24								
25								
Coefficient of Variation:		0.37	0.39	0.40	0.69			
Mann-Kendall Statistic (S):		-3	0	-2	-5			
Confidence Factor:		64.0%	39.3%	62.5%	82.1%			
Concentration Trend:		Stable	Stable	Stable	Stable			



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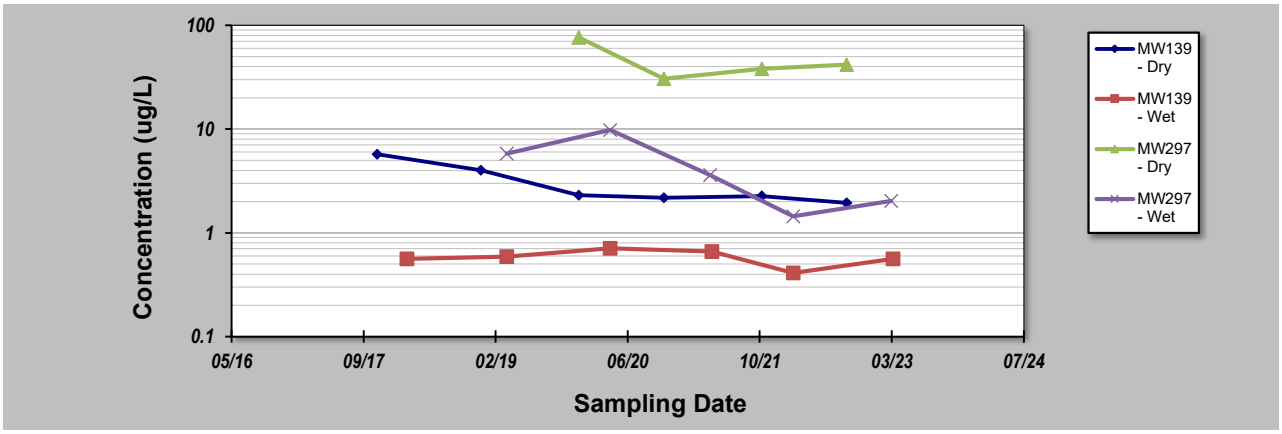
GSI MANN-KENDALL TOOLKIT
for Constituent Trend Analysis

Evaluation Date:	21-Jul-23	Job ID:	60612561
Facility Name:	RAAF Base Darwin - South East	Constituent:	PFOS+PFHxS - seasonally filtered
Conducted By:	DDT	Concentration Units:	ug/L

Sampling Point ID:	MW139 - Dry	MW139 - Wet	MW297 - Dry	MW297 - Wet			
Sampling Event	Sampling Date	PFOS+PFHXS - SEASONALLY FILTERED CONCENTRATION (ug/L)						
1								
2								
3								
4								
5	13-Nov-17	5.7						
6	8-Jan-18							
7	5-Mar-18		0.56					
8	10-Dec-18	4.02						
9	18-Mar-19		0.59		5.8			
10	16-Dec-19	2.31		76.3				
11	13-Apr-20		0.71		9.78			
12	2-Nov-20	2.17		30.6				
13	9-Nov-20							
14	26-Apr-21				3.6			
15	3-May-21		0.66					
16	8-Nov-21	2.26		38.1				
17	7-Mar-22		0.41		1.44			
18	26-Sep-22	2		41.8				
19	10-Oct-22							
20	13-Mar-23				2.02			
21	20-Mar-23		0.56					
22								
23								
24								
25								
Coefficient of Variation:		0.49	0.18	0.43	0.75			
Mann-Kendall Statistic (S):		-13	-2	0	-6			
Confidence Factor:		99.2%	57.0%	37.5%	88.3%			
Concentration Trend:		Decreasing	Stable	Stable	Stable			



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