Prepared for
Department of Defence
ABN: 68706814312

Ongoing Monitoring Interpretive Report - 2022

PFAS OMP - Wide Bay Training Area

29-Apr-2024
Doc No. 60612563_RP_068_4_240429

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Client: Department of Defence

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Prepared by

,

29-Apr-2024

Job No.: 60612563

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Quality Information

Document	Ongoing Monitoring Interpretive Report - 2022
Ref	60612563
Date	29-Apr-2024
Prepared by	[redacted]
Reviewed by	[redacted]

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
0	24-Feb-2023	Draft	[redacted] Associate Director	
1	03-Nov-2023	Draft	[redacted] Associate Director	
2	15-Dec-2023	Final	[redacted] Associate Director	
3	25-Mar-2024	Final	[redacted] Associate Director	
4	29-Apr-2024	Final	[redacted] Associate Director	[redacted]

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Abbreviations

Abbreviation	
AFFF	Aqueous film forming foam
AHD	Australian height datum
AIR	Annual Interpretive Report
ANZECC	Australia New Zealand Environmental Conservation Council
ASC NEPM	Assessment of Site Contamination National Environment Protection Measure 1999 (as amended 2013)
COC	Chain of custody
CSM	Conceptual site model
DCMM	Defence Contamination Management Manual
Defence	Department of Defence
DO	Dissolved oxygen
DQI	Data quality indicators
DQO	Data quality objectives
DSI	Detailed site investigation
EC	Electrical conductivity
HEPA	Heads of Environmental Protection Agencies
LOR	Limit of reporting
MA	Management Area
NATA	National Association of Testing Authorities
NEMP	National Environmental Management Plan
NEPC	National Environment Protection Council
NHMRC	National Health and Medical Research Council
ORP	Oxidation reduction potential
OMIR	Ongoing Monitoring Interpretive Report
OMP	Ongoing Monitoring Plan
PFAS	Per- and poly-fluorinated alkyl substances
PFHxS	Perfluorohexane sulfonate
PFOA	Perflurooctanoic acid
PFOS	Perflurooctanesulfonic acid
PMAP	PFAS management area plan
POL	Petroleum, oils and lubricants
PSI	Preliminary site investigation
QA/QC	Quality assurance / quality control
SAQP	Sampling analysis and quality plan
SPR	Source-pathway-receptor
TSS	Total suspended solids

Abbreviation	
US EPA	US Environmental Protection Agency
WBTA	Wide Bay Training Area
WTP	Water treatment plant
WWTP	Wastewater treatment plant

Units

Abbreviation	Term	Abbreviation	Term
GWE	Groundwater Elevation	°C	Degrees Celsius
kg	Kilogram	m AHD	Metres Australian Height Datum
km	Kilometre	m bTOC	Metres below Top of Casing
km^2	Kilometre squared	mg	Milligram
mV	Millivolt	mg/L	Milligram per litre
L	Litres	mbgl	Metres below ground level
m	Metre	µS/cm	Micro-Siemens per centimetre
mm	Millimetre	SWL	Standing Water Level
cm	Centimetre	µg	Microgram
Ha	Hectare	µg/L	Microgram per litre

Executive Summary

Background

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the Ongoing Monitoring Plan (OMP) (Defence, 2020) for monitoring of per- and poly-fluorinated alkyl substances (PFAS) at Wide Bay Training Area (WBTA) (Base ID: 0224) (the 'Base') located to the west of Tin Can Bay, approximately 50 km to the south-east of Maryborough, Queensland. The residential suburbs, Wallu and Wallu Heights, are located adjacent to the southern WBTA boundary.

The objective of the monitoring was to continue to assess changes in the nature and extent of PFAS within the environment, where Defence's historical use of legacy aqueous film-forming foam (AFFF) has led to an identified potentially elevated risk or potential future risk to a receptor. A receptor is something that could be adversely affected by the contaminant of potential concern (PFAS) such as a person or an ecosystem.

This Ongoing Monitoring Interpretive Report (OMIR) provides an interpretation of the results from the monitoring data collected in 2022 and has been prepared in accordance with the Defence (2021a) OMP Annual Interpretive Report Guidance.

Monitoring Program

AECOM completed periodic monitoring of groundwater, surface water and sediment from selected locations in the WBTA Management Area (MA) between May 2022 and October 2022 in accordance with the sampling analysis and quality plan (AECOM, 2022b,c). The MA includes the Base and the residential suburb of Wallu, refer to **Figure 1**, **Appendix A**. Monitoring results indicated that the concentrations of PFAS in groundwater, surface water and sediment were similar to previous results.

Interpretive Assessment

Groundwater

Sum of perfluorohexane sulfonate (PFHxS) and perflurooctanesulfonic acid (PFOS) concentrations exceeded PFAS National Environmental Management Plan (NEMP) (HEPA, 2020) human health guideline values at two monitoring wells (MW121 and MW122) in the eastern portion of Camp Kerr, close to the Base entrance road during both sampling events in 2022. The concentrations were consistent with historical results for these wells. PFHxS and PFOS were not detected in any other monitoring well in the eastern portion of Camp Kerr. The non-detection of PFAS in monitoring wells down- and cross-gradient of MW121 and MW122 indicates the extent of PFAS in groundwater is localised and that the PFAS concentrations are stable and unlikely to be migrating off-Base. The source of the PFAS in groundwater at this location is not known but could be related to historical irrigation of the ground close to monitoring wells with treated water (potentially containing PFAS) from the wastewater treatment plant (WWTP). Three samples of treated water were collected during the 2022 monitoring period and analysed for PFAS. The samples reported concentrations of PFHxS at, or close to, the limit of reporting, indicating treated water is not currently a PFAS source.

Groundwater in the western portion of Camp Kerr flows from east to west towards Wallu. The non-detection of PFAS in groundwater samples collected from off-Base monitoring wells located beyond the western Base boundary shows that PFAS is not migrating in groundwater off-Base to the west towards Wallu. PFAS were detected in groundwater samples collected from a monitoring well adjacent to the southern Base boundary (MW118) in both sampling events. The concentration of sum of PFHxS and PFOS in May 2022 exceeded the drinking water guideline (HEPA, 2020) for the first-time, however, the October 2022 results did not exceed the HEPA (2020) guideline value and was similar to the historical range. The detected concentrations may reflect ongoing dispersion of residual PFAS in groundwater.

With one exception, PFAS were not detected in groundwater samples from bores at other locations across the southern portion of the MA. The exception was the detection of PFOS in May 2022 in groundwater from MW109, located close to the eastern Base boundary. The concentration was marginally above the limit of reporting and potentially a false positive, as PFOS was not detected in the groundwater sample collected from MW109 in October 2022. Sampling locations in the southern portion of the MA provide information on areas where landfilling has occurred, at the airfield where refuelling

and firefighting activities may have occurred and at locations where groundwater may discharge to surface water. This indicates source areas of PFAS are unlikely to be present in these areas. The non-detection of PFAS in the southern portion of the MA during the monitoring period is consistent with historical results reported during the detailed site investigation (DSI) (AECOM 2020a) and the 2021 AIR (AECOM, 2022d),

Surface Water and Sediment

PFAS concentrations in surface water and sediment samples collected from on-Base drainage channels, on-Base creeks and off-Base drainage features and off-Base dams were consistent with historical data. In Camp Kerr and Wallu area, PFAS were detected in on-Base drainage features and off-Base dams and ephemeral watercourses. This indicates a line of evidence for the presence of an overland flow pathway for PFAS in surface water on-Base to migrate to surface water features in Wallu. Concentrations detected during the monitoring period did not exceed HEPA (2020) human health guideline values.

Two surface water samples from the estuarine Schnapper Creek in the southern portion of the Base reported detectable concentrations of PFOS in the monitoring period, which exceeded the HEPA (2020) ecological guideline for freshwater 99% species protection. These concentrations may indicate the potential for relatively minor source(s) of PFAS in the eastern portion of the Base. The presence of potential off-Base PFAS sources near Tin Can Bay include the waste transfer station, sewage treatment works and fire station. These are located east of the eastern Base boundary and are considered to have the potential to contribute PFAS to the environment in the estuarine Schnapper Creek system and Ramsar area.

Conceptual Site Model and Risk Profile

The conceptual site model for WBTA presented in the detailed site investigation (DSI) (AECOM, 2020a) was reviewed and no changes were identified to the sources, pathways or receptors.

Based on the 2022 results, the risk profile to human health, within the MA, is unchanged, based on the following conclusions of the data assessment:

- The extent of PFAS in groundwater is similar to that presented in the DSI (AECOM, 2020a).
- PFAS concentrations in groundwater from individual wells were in accordance with historical ranges.
- PFAS concentrations in surface water locations were similar to previous (historical) results. There were no first-time detections and no new exceedances of HEPA (2020) human health guideline values during the monitoring period.
- PFAS were not detected at concentrations exceeding the laboratory limit of reporting in sediment samples collected from sampling locations in the MA in 2022.

Conclusions

Following a review of the data collected during the 2022 monitoring period, there have been no significant changes to the understanding of risks associated with PFAS in the WBTA MA and distribution of PFAS.

A review of the OMP was completed in February 2023 (AECOM, 2023). The review recommended optimising the program to remove locations where PFAS have not been detected. The outcome of the review was the removal of six groundwater monitoring wells and four surface water and sediment sampling locations, which were all located on the Base. Two off-Base surface water and sediment sampling locations were also removed as stakeholders have declined access. Replacement locations were not required as downstream sampling locations are suitably located to provide monitoring information. The updated program will commence in April 2023.

The program includes off-Base ground water sampling locations beyond the Base’s western boundary to monitor the potential migration of PFAS in groundwater towards Wallu and to monitor PFAS migrating in surface water flowing overland and entering surface water bodies in Wallu. Continued monitoring of these locations will provide information on the risk to down-gradient receptors.

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) was engaged by the Department of Defence (Defence) to implement the Ongoing Monitoring Plan (OMP) (Defence, 2020) for monitoring of per- and poly-fluoroalkyl substances (PFAS) at Wide Bay Training Area (WBTA) (Base ID: 0224) (the 'Base'), located to the west of Tin Can Bay, approximately 50 kilometres (km) to the south-east of Maryborough, Queensland. The location of the Base and the Management Area (MA) is shown in **Figure 1** in **Appendix A**. The residential suburbs Wallu and Wallu Heights are located adjacent to the southern WBTA boundary.

The monitoring targeted PFAS in a range of environmental media at selected locations on-Base and in surrounding off-Base areas within the WBTA MA.

To meet the objectives of the OMP, the monitoring was undertaken in accordance with the sample analysis and quality plan (SAQP) (AECOM, 2022b,c and **Appendix E**). This report has been prepared in accordance with the Defence (2021a) OMP Annual Interpretive Report Guidance.

1.1 Purpose and Objectives

The objective of the OMP is to set out a program of monitoring to assess the changes in the nature and extent of PFAS within the environment, where Defence's historical use of legacy aqueous film forming foam (AFFF) has led to an identified potentially elevated risk to a receptor, or potential future risk to a receptor.

Assessing changes in the distribution, concentration, and transport pathways of the contaminants against appropriate guideline values provides:

- An evidence base for targeted and effective risk management decision making to protect human health and environmental receptors.
- An early warning that additional management of PFAS contamination may be warranted in areas not currently understood to be affected by PFAS where PFAS are detected for the first time.

These data will be evaluated to determine environmental variability and significant trends in PFAS concentrations. This will inform any changes to the known risk profile and recommendations for triggers to review the PFAS Management Area Plan (PMAP) (Defence, 2020), if required.

1.2 Scope of Work

The scope of works for this interpretive report included assessing changes to the distribution of PFAS over the preceding 12-month period (inclusive of two monitoring events in May 2022 and October 2022 and one *ad hoc* sampling event in August 2022) and how these change the understanding of the conceptual site model (CSM) and risk profile for PFAS. This includes evaluation of data reported in the 2022 factual reports as well as data from historical reports, as follows:

- *Sampling Event Factual Report, May 2022, PFAS OMP, Wide Bay Training Area* (AECOM, 2022e)
- *Sampling Event Factual Report, October 2022, PFAS OMP, Wide Bay Training Area* (AECOM, 2022f).
- *Annual Interpretive Report – 2021, PFAS OMP, Wide Bay Training Area* (AECOM, 2022d).
- *PFAS Detailed Site Investigation, Wide Bay Training Area* (AECOM, 2020a).
- *Wide Bay Training Area Environmental Investigation: Off-Base Biota Sampling in Residential Dams, Wallu, October 2020* (AECOM, 2020b).
- *PFAS Management Area Plan, Wide Bay Training Area* (Defence, 2020).

2.0 Site Setting

The subsections below describe the site and environmental setting for WBTA.

2.1 Base Description

Table 1 summarises the Base identification and setting presented in the PMAP (Defence, 2020) for WBTA.

Table 1 WBTA Identification and Setting Summary

Element	Description
Base ID	0224
Location	The MA is located on Tin Can Bay Road, Tin Can Bay, Queensland, 4580, approximately 50 km south-east of Maryborough, see **Figure 1**, **Appendix A**. The MA comprises WBTA (on-Base) and the small residential area of Wallu located adjacent to the south-west corner of the Base (off-Base). Base features are shown in **Figure 2**, **Appendix A**. WBTA covers approximately 19,100 hectares of remnant bush and coastal to sub-coastal wetland.
Regional meteorology	The region experiences warm wet summers and mild winters. Based on climate data from Rainbow Beach (040856) the region has a mean maximum temperature in January of 28.9 degrees Celsius (°C) and a mean minimum temperature in July of 10.3°C (Bureau of Meteorology, 2023). The region experiences an annual mean rainfall of 1470.0 millimetres (mm). On average, February experiences the highest mean rainfall of 209.0 mm, whereas September experiences the lowest monthly mean rainfall of 56.2 mm.
Topography	The DSI (AECOM, 2020a) reported that the western margin of the WBTA comprises undulating to strongly undulating old coastal plain, about 90 metres (m) above Australian Height Datum (AHD). The central and south-eastern parts of WBTA comprise gently to strongly undulating portions of old dissected coastal plain, while the north-eastern part of the area is coastal plain with low sandy banks and weakly defined drainage lines. Based on a 25 m-resolution digital elevation model of the WBTA), total relief is 112 m (from sea level), and slopes range from 0° to 10°. Nearly the entire area (97.2%) comprises slopes <5°, with the remainder being 5–10°. Wallu, located 100 m to the west of Camp Kerr, is flat (approximately 65 mAHD) and at a slightly lower elevation (approximately 10 m) than Camp Kerr (approximately 75 mAHD). There are a number of surface water bodies (dams) at Wallu which appear to be mainly fed from an unnamed creek to the west. The creek has multiple tributaries that drain areas of higher ground (elevations of over 100 mAHD) to the north, west and south-west of Wallu. Surface water flows out of Wallu to the south-east via an ephemeral waterway that crosses under Clyde Road and Tin Can Bay Road and discharges into a dam in the eastern portion of Wallu, following the natural topography.
Geology and hydrogeology	The MA is underlain by the Late Triassic to Early Jurassic Duckinwilla Group and Grahams Creek Formation. The Duckinwilla Group comprises feldspathic and quartzose sandstone, shale, siltstone and coal. The Grahams Creek Formation comprises intermediate to acidic lava flows and pyroclastics, tuffaceous sandstone and siltstone. The marine transgressive sequence of the Duckinwilla Group comprises almost 70% of the total area. This sequence is capped in places with Oligocene to Miocene duricrusted old land surfaces comprised of ferricrete, silcrete and indurated paleosols. These deposits comprise almost 10% of the area. Gully systems draining the marine transgressive sequence and duricrusted areas are filled with Quaternary undifferentiated alluvial plains comprised of sand, silt, clay, and gravel.

Element	Description
	Groundwater beneath WBTA is semi-confined within the sandstone of the Tertiary Duckinwilla Group, with flow likely to occur as fracture flow. Measurements of the physicochemical parameters during the preliminary site investigation (PSI) (AECOM, 2019) and DSI (AECOM, 2020a) indicated the groundwater was slightly acidic to neutral and fresh [<500 milligrams per litre (mg/L) total dissolved solids] and suitable for most purposes (including drinking water and irrigation). The DSI reported that a shallow groundwater aquifer was present beneath the Base with groundwater encountered between 1.7 and 14.7 m below top of casing (mbtoc). Groundwater is extracted in Camp Kerr for drinking water and domestic purposes from two bores. Bore 1 (POT001) is screened between 18 and 78.4 metres below ground level (mbgl) and Bore 2 (POT005) is screened between 30 and 51.5 mbgl. They are screened at deeper depth compared to the groundwater monitoring wells (the deepest screened section in the wells is 16 to 20.5 mbgl) and are either screened in a deeper section of the aquifer or in a deeper aquifer. Due to the length of the screened sections, there is potential for connection between different sections of the aquifer or separate aquifers. Treated water from the wastewater treatment plant (WWTP) in Camp Kerr is irrigated to ground at three locations: • west of the WWTP • immediately south of the main entrance road • immediately north of the main entrance road.
Surface water	WBTA is located within the Mary River Basin. There are seven main creek catchments on-Base (refer to the DSI, AECOM, 2020a): • Mosquito Creek and its tributaries drain the western part of WBTA into the Kauri Creek Inlet • Kauri Creek in the central part of WTBA, flows in a northerly direction through the centre of the Base to the Kauri Creek Inlet and east to Tin Can Inlet • Kangaroo Creek in the central southern portion of WBTA, flows into the Kauri Creek • Schnapper Creek in the south-east, flows east into Tin Can Inlet • Griffen Creek in the east, flows east into Tin Can Inlet • Teebar Creek in the east, flows east into Tin Can Inlet • Little Stony Creek in the north-west, flows north into Kauri Creek. Kauri Creek is the main draining watercourse at the WBTA. Tributaries that flow into Kauri Creek include Mosquito Creek, Kangaroo Creek, and Little Stony Creek. Kauri Creek flows from south to north across the Base, then east to the Great Sandy Strait. The Teebar Creek, Schnapper Creek and Griffen Creek catchments occupy the eastern portion of the Base and drain to the east into Tin Can Inlet. The Teebar Creek, Griffen Creek and Snapper Creeks are located in the lower lying areas of the Base and are seasonally and/or tidally influenced depending on their location. The headwaters of Mosquito, Kangaroo and Kauri Creeks rise to the south and south-west beyond the boundary of WBTA, indicating off-Base surface water flows onto the Base. The suburb of Wallu, located adjacent south-west of the Base has several surface water dams and an unnamed waterway that flows from Wallu to the south-east.

Element	Description
Current and previous land use on-Base	WBTA has been in use by Defence since 1958. Prior to 1958, the area comprising WBTA was likely used for timber logging.
Land uses surrounding the Base	The surrounding land use is predominantly State Forest with some small residential settlements to the south-west and south and the larger residential area of Tin Can Bay to the east and south-east. Identified land uses in each direction from WBTA are summarised below. • North: Toolara State Forest and Great Sandy Strait. • East: Tin Can Bay waste transfer station and sewage treatment plant, township of Tin Can Bay (residential) and Great Sandy Strait. • South: Township of Wallu west of Camp Kerr (residential), township of Wallu Heights east of Camp Kerr (residential), Tin Can Bay Road and Toolara State Forest. • West: Maryborough Cooloola Road and Toolara State Forest. The PSI (AECOM, 2019) identified that there is significant commercial and recreational fishing activity in waters surrounding the Base. Waterways at and downstream of WBTA are listed as important wetlands under the Ramsar Convention (The Convention on Wetlands of International Importance). The Great Sandy Strait Ramsar area includes Tin Can Inlet and tidal sections of creeks in the northern and eastern portions of the Base. A land and water use survey for residents in Wallu was completed in 2019 and reported in the DSI (AECOM, 2020a). Based on the responses, the private dams in Wallu are used for recreational purposes at six of the properties. At three properties, dam water was used for irrigating crops or watering livestock (details in the surveys indicate water is used for irrigation of vegetable gardens). Two of the upstream dams were used infrequently to catch yabbies.

2.2 WBTA Management Area

The MA comprises WBTA (on-Base) and the small residential area of Wallu located adjacent to the south-west corner of the Base (off-Base). Refer to **Figure 1**, **Appendix A**.

2.3 Source Areas

Interviews conducted during the PSI (AECOM, 2019) did not identify specific information regarding the potential use of firefighting foams containing PFAS on-Base and the types of AFFF potentially used are not known. No specific information was obtained on the potential for sources of PFAS other than firefighting foams at the Base.

No primary PFAS source areas were identified in the investigations [PSI (AECOM, 2019) and DSI (AECOM, 2020a)] completed to date. The investigations have identified the presence of PFAS in on-Base groundwater and surface water, indicating that AFFF may have historically been used on-Base. The PSI and DSI identified the potential storage and use (for emergency and demonstration purposes) of small AFFF fire extinguishers at the petroleum, oil and lubricants (POL) store and refuelling area, in the caretaker's residence area and at the demonstration area north of Camp Kerr, refer to **Figure 2**, **Appendix A**. The PSI and DSI also identified the potential for wash down of liquids containing PFAS at the vehicle wash point. PFAS is also present in the treated effluent which has been historically irrigated to ground in the area of the WWTP and adjacent to the Camp Kerr entrance road. Historically, PFAS in effluent may have been discharged to creeks.

Potential off-Base sources of PFAS include the Tin Can Bay waste transfer station and sewage treatment works, fire station, areas of infilling which may include waste containing PFAS and areas where historical bushfires may have been suppressed using firefighting foam containing PFAS.

3.0 Sampling and Analytical Methodology

3.1 Sampling Locations

The sampling events conducted between May 2022 and October 2022 included the collection of selected groundwater, surface water and sediment samples from across the MA. Sampling locations at WBTA are shown in **Figure 3** and **Figure 4** in **Appendix A**.

3.2 Summary of OMP works 2022

A summary of the monitoring works implemented as part of the SAQP (**Appendix E**) between May and October 2022 is summarised below:

3.2.1 May 2022 Sampling Event

- Monitoring works undertaken between 9 and 13 May 2022
- Groundwater sampling of 17 monitoring wells/bores on-Base and five monitoring wells off-Base in the shallow aquifer.
- Groundwater sampling of two abstraction bores at tap outlets. These bores are screened in a deeper section of the aquifer, or potentially, in a deeper aquifer, for more information refer to **Table** 1.
- Surface water sampling of 15 on-Base locations and three off-Base locations.
- Sampling of the outlet of the WWTP.
- Sediment sampling at 18 locations (co-located with surface water samples).

3.2.2 August 2022 Sampling Event (Ad hoc)

- Sampling of the outlet of the WWTP on 25 August 2022 during a period of high site usage. This was a one-off sampling event and reported in the October 2022 Sampling Event Factual Report.

3.2.3 October 2022 Sampling Event

- Monitoring works undertaken between 17 and 21 October 2022.
- Groundwater sampling of 17 monitoring wells/bores on-Base and five monitoring wells off-Base in the shallow aquifer.
- Groundwater sampling of two abstraction bores at tap outlets.
- Surface water sampling of 15 on-Base locations and three off-Base locations.
- Sampling of the outlet of the WWTP.

3.3 Sampling Methodology and Laboratory Analysis

Refer to the SAQP (AECOM, 2022b,c, **Appendix E**) for the sampling methodology, data quality objectives (DQOs) including quality assurance (QA) and quality control (QC) parameters for field and laboratory analysis programs. Refer to the factual reports (**Appendix D**) for QA/QC discussion and fit for purpose data.

3.4 SAQP Deviations

The works undertaken over the monitoring period complied with the SAQP (AECOM, 2022b,c), with some minor exceptions discussed in **Section 3.4.1** and **3.4.2**.

3.4.1 May 2022 Sampling Event

The SAQP nominated sampling to be completed in April 2022 however the monitoring event was delayed to May 2022 due to ongoing training exercises being carried out.

A total of 18 out of the 19 co-located surface water and sediment locations were accessible and able to be sampled. Access permission was not provided for SW024/SD024, which monitored water and sediment quality in a dam located on a private property. Non-sampling of this location means there is no information available on PFAS concentrations in this surface water body. The dam drains to the east, discharging along a waterway, which is monitored by sampling location SW025/SD025. As PFAS data are available at this downstream sampling location, the non-sampling of SW024/SD024 is considered to have a minimal impact on the program and understanding of the extent of PFAS in surface water.

3.4.2 October 2022 Sampling Event

A total of 18 out of the 19 co-located surface water locations were accessible and able to be sampled. Access permission was not provided for SW024. As noted above, non-sampling of this locations is not considered critical to understanding the distribution of PFAS as a downstream location (SW025) was monitored during the sampling event.

3.5 Quality Assurance and Quality Control

Data validation pertaining to the data in this report was completed and is discussed in the factual reports listed below, which are presented in **Appendix D**:

- *Sampling Event Factual Report, May 2022, PFAS OMP, Wide Bay Training Area* (AECOM, 2022e)
- *Sampling Event Factual Report, October 2022, PFAS OMP, Wide Bay Training Area* (AECOM, 2022f).

Data validation procedures used in the assessment of the field and laboratory QA/QC data indicate that the reported field and analytical results in the sampling events (May 2022, August 2022 and October 2022) are representative of the sample locations. The overall quality of the analytical data produced is acceptably reliable for the purpose of the factual and interpretive reports.

4.0 Assessment Criteria

Adopted screening criteria references national guidance in the form of the PFAS National Environmental Management Plan (NEMP) (HEPA, 2020), Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. This report was prepared using the following guidance documents:

- Heads of Environmental Protection Agencies (HEPA), 2020. PFAS National Environmental Management Plan (NEMP), version 2.0 January 2020.
- Department of Health, 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).

The adopted PFAS screening criteria used to assess the data generated as part of the OMP are presented in **Table 2** below.

Table 2 Summary of Adopted Screening Criteria

Pathway	Compound	Criteria	Comment / Reference
Human Health Receptors			
Drinking water - groundwater	PFOS + PFHxS	0.07 µg/L	The values are from the PFAS NEMP (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 are from PFAS NEMP (2020), which are from NHMRC, 2019). *All surface water results were compared to these criteria.*
	PFOA	10 µg/L	
Ecological Receptors			
Freshwater (99% species protection values)	PFOS	0.00023 µg/L	The values are from the PFAS NEMP (HEPA, 2020). For the purposes of preliminary screening of analytical water results, the laboratory limit of reporting (LOR) was adopted rather than sole use of the criteria value. Where results exceeded the LOR, the 99% level of protection for slightly to moderately disturbed ecosystems was applied. This approach is generally adopted for chemicals that bioaccumulate and biomagnify in wildlife. *All surface water and groundwater results were compared to these criteria.*
	PFOA	19 µg/L	
Freshwater (95% species protection values)	PFOS	0.13 µg/L	Surface water results from the ephemeral waterway south of Clyde Road (SW025) were screened against HEPA (2020) freshwater ecological guidelines for slightly to moderately disturbed ecosystems (95% species protection). This was due to the ephemeral nature of this waterway, where aquatic ecosystems are likely to be temporary.
	PFOA	220 µg/L	

At the time of report preparation, no HEPA (2020) endorsed criteria were available for PFAS in sediment.

5.0 Contextual and Ancillary Information

The development of the PMAP (Defence, 2020) involved a review of the key migration pathways and consideration of available management options. Following this review, no specific management options were considered necessary based on the following aspects:

- The identified nature and extent of PFAS contamination was limited
- exposure risks to human health were low
- the net benefit of source, pathway or exposure/receptor management and resultant risk reduction was considered marginal.

The OMP provides data for ongoing assessment of the potential changes in the nature of PFAS in groundwater and surface water systems.

Events that have occurred within the MA which may affect the outcomes of the sampling are summarised in **Sections 5.1** to **5.3**.

5.1 Remediation Projects

No remediation projects were undertaken on-Base during the 2022 monitoring period and there are no planned remediation activities for the future.

5.2 Infrastructure Projects

A summary of recent and planned infrastructure projects on-Base (provided by the Environment and Sustainability Manager for WBTA in January 2022) are summarised in **Appendix C**. These projects included repairs to roads and fencing, demolition and rebuild of one building, replacement of the communications tower next to the Range Control Building, replenishment of firing range mounds at two ranges, demolition of the forward operating base and, various flood repair works to causeways along major roads and the demolitions range biobasin.

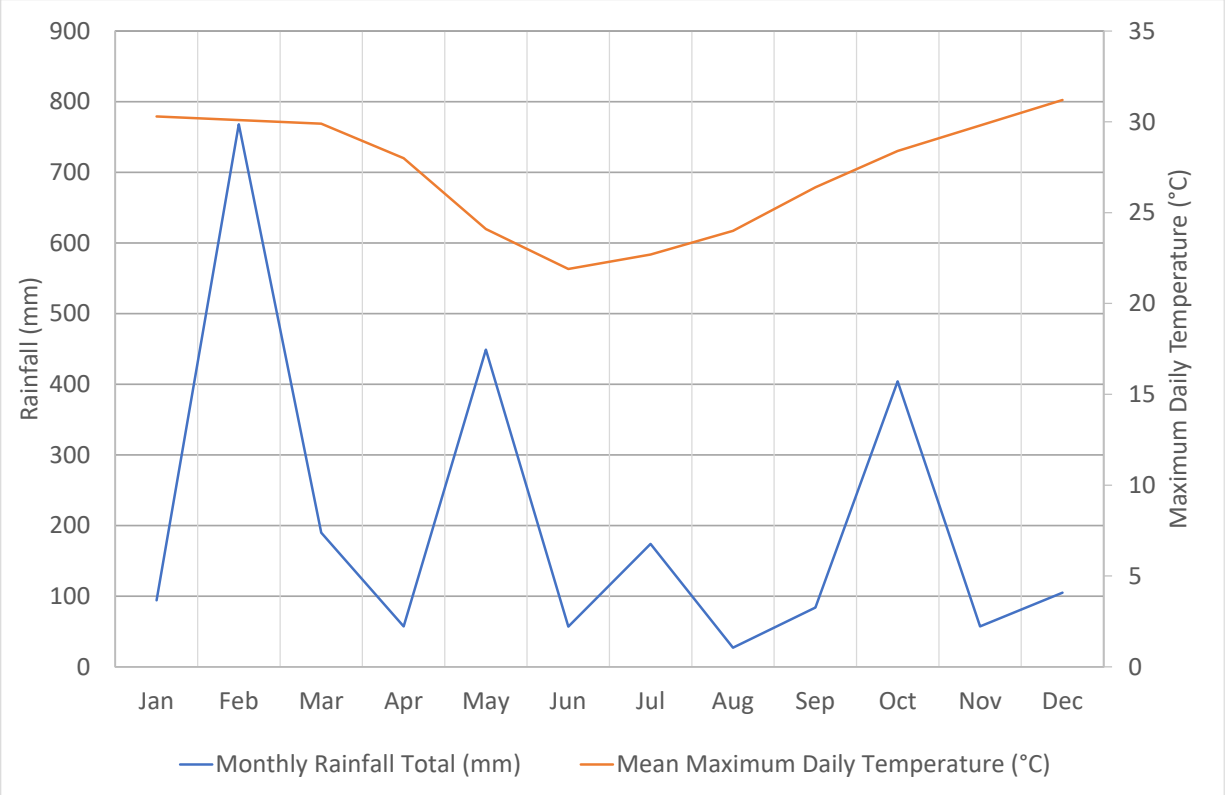
The infrastructure projects are considered unlikely to have disturbed or excavated PFAS-contaminated soil as there are no known on or off-Base PFAS in soils source areas. The infrastructure projects are unlikely to have affected groundwater or surface water results.

5.3 Weather Conditions in 2022

Chart 1 presents rainfall and temperature data or the weather station at Tin Can Bay (Defence) (Station ID 140010). During 2022, there was a total of 2,566 mm of rainfall at this weather station. This is approximately 75% higher than the mean rainfall for this area, which is 1,470 mm based on the 1992 to 2022 dataset from Rainbow Beach weather station (040856) located 9.1 km away (Bureau of Meteorology, 2023)[1]. The higher rainfall total in 2022 was due to the La Niña phase of the El Niño-Southern Oscillation. The wetter weather during 2022 has the potential to increase surface water flow conditions which may reduce PFAS concentrations due to dilution effects.

[1] The weather station at WBTA (140010) is relatively new and only has data for the period 2018 to 2022, therefore the mean rainfall for Rainbow Beach has been used for comparison.

Chart 1 Rainfall and Maximum Daily Temperature at Station 140010 during 2022



6.0 Monitoring Data Summary

6.1 Groundwater

6.1.1 Groundwater Elevations

Groundwater elevations calculated from the monitoring well gauging for each sampling event are summarised in **Table 3** below. The range in groundwater elevations in the shallow sandstone aquifer in the May and October 2022 sampling events are similar.

Table 3 Depth to Groundwater and Groundwater Elevation

Date	Number of wells	Range in hydraulic head (mAHD)
May 2022	22	8.75 to 73.33
October 2022	22	8.43 to 73.49

Depth to water is not able to be measured from the two abstraction bores (POT001 and POT005) due to the presence of pumping infrastructure.

6.1.2 Groundwater Flow Directions

Inferred groundwater contour maps for WBTA for the two monitoring periods are presented as **Figure 5** to **Figure 8** in **Appendix A**. The regional groundwater flow is from west to north-east towards Tin Can Inlet. Groundwater flow at Camp Kerr, located in the south-eastern portion of the Base is inferred to be radial. Groundwater flow direction is discussed further in **Section 7.1**. The inferred flow directions in 2022 are consistent with previous sampling events since 2019.

6.1.3 Groundwater Quality Parameter Field Measurements

A summary of the groundwater quality parameters, measured in the shallow sandstone aquifer, at WBTA in May and October 2022, is presented in **Table 4**. Results are also presented in **Table T1**, **Appendix B**. The groundwater was generally clear with no odours or sheens observed in any wells.

Table 4 Water Quality Parameter Field Measurements in Groundwater from the 2022 Sampling Events

Field Parameter		Number of wells	Minimum	Maximum	Mean
DO (mg/L)	May-22	24	0.22	3.81	1.47
	Oct-22	24	0.6	4.0	2.1
EC (µS/cm)	May-22	24	67.0	572	233
	Oct-22	24	72.5	621	265
pH	May-22	24	4.3	6.8	5.2
	Oct-22	24	4.8	7.1	5.7
ORP (mV)	May-22	24	116.1	477	360
	Oct-22	24	251	343	306
Temp (°C)	May-22	24	19.5	23.5	22.1
	Oct-22	24	19.4	23.8	21.7

Note: DO is dissolved oxygen, EC is electrical conductivity, ORP is oxidation reduction potential, Temp is temperature.

Based on the mean groundwater parameter results over the sampling period, the aquifer unit at WBTA can be characterised as slightly acidic, mildly oxygenated, mildly reducing and fresh.

6.2 Groundwater Analytical Results

The groundwater laboratory PFAS analytical results are presented in **Table T2** in **Appendix B**. Groundwater sample results for sum of PFHxS and PFOS in groundwater in 2022 are presented in **Figure 9** (for May 2022) and **Figure 10** (for October 2022) in **Appendix A**. **Table 5** summarises the 2022 laboratory results for PFAS in groundwater. As PFOA was not detected in any of the groundwater samples in 2022, no figures showing PFOA results have been included.

Table 5 Summary of PFAS in Groundwater in 2022

Event	No. of Locations Analysed	Compound	Concen-tration Range (µg/L)	No. of Sample Locations >LOR	First-time detections	New exceedance of HEPA (2020) drinking water guidelines	New minimum	New maximum
May 2022	24	PFOS	<0.01 – 0.04	4	MW109 (0.02 µg/L)	None	None	0.02 µg/L (MW109) 0.03 µg/L (MW118) 0.04 µg/L (MW122)
		PFOA	<0.01	0	None	None	None	None
		PFOS+ PFHxS	<0.01 – 0.2	6	MW109 (0.02 µg/L)	MW118 (0.09 µg/L)	None	0.02 µg/L (MW109) 0.09 µg/L (MW118) 0.02 µg/L (POT005)
October 2022	24	PFOS	<0.01 – 0.06	3	None	None	None	0.06 µg/L (MW122)
		PFOA	<0.01	0	None	None	None	None
		PFOS+ PFHxS	<0.01 – 0.19	3	None	None	None	None

There was a first-time detection of sum of PFHxS and PFOS in MW109 in May 2022, which marginally exceeded the limit of reporting. This monitoring well is located on-Base adjacent to Snapper Creek in the eastern portion of the southern part of the MA. PFAS were not detected in groundwater from this well in October 2022. The detection in May 2022 is potentially a false positive.

There was one new exceedance of the drinking water guideline (HEPA, 2020) for sum of PFHxS and PFOS in the groundwater sample from off-Base monitoring well MW118 in May 2022. The October 2022 results for MW118 did not exceed the HEPA (2020) drinking water guideline value. There are no sensitive groundwater receptors down-gradient of MW118.

Overall, the May 2022 and October 2022 datasets are considered to be consistent with historical data. The interpretation of the results is discussed in **Section 7.2**.

6.3 Surface Water Results

6.3.1 Surface Water Quality Parameter Field Measurement

Water quality parameters were measured prior to collecting surface water samples are presented in **Table T3**, **Appendix B** and in the sampling event factual reports (**Appendix D**) and are summarised in **Table 6** (for May 2022) and **Table 7** (for October 2022).

Table 6 Summary of Surface Water Quality Parameter Field Measurement Results: May 2022

Parameter	Units	May 2022 Freshwater locations (15 samples)		May 2022 Estuarine locations (3 samples)	
		Range	Mean	Range	Mean
pH	-	4.7 – 6.3	5.4	4.8 – 5.3	5.1
Temperature	ºC	20.5 – 23.6	21.8	21.2 – 21.6	21.4
DO	mg/L	2.5 – 6.8	4.3	4.6 – 5.8	5.0
ORP	mV	308 – 401	358	341 – 408	366
EC	µS/cm	68 – 143	102	109 – 398	224

Table 7 Summary of Surface Water Quality Parameter Field Measurement Results: October 2022

Parameter	Units	October 2022 Freshwater locations (16 samples)		October 2022 Estuarine locations (3 samples)	
		Range	Mean	Range	Mean
pH	-	4.9 – 6.8	6.2	6.7 – 7.3	6.9
Temperature	ºC	18.4 – 25.6	21.6	24.9 – 27.4	26.0
DO	mg/L	1.0 – 6.5	3.6	3.9 – 4.6	4.3
ORP	mV	254 – 358	289	263 – 313	294
EC	µS/cm	34 – 545	166	24179 – 39340	29580

Based on the averaged results the freshwater can be characterised as near neutral, moderately oxygenated, mildly reducing and fresh. The estuarine water is similar with the exception of being fresh in May and saline in October. This indicates estuarine samples were collected during outgoing tide in May 2022 and during incoming tide during October. These results are consistent with previous results (AECOM, 2020a, AECOM 2022d).

6.3.2 Surface Water Observations

Observations recorded during sample collection are presented in **Table T3**, **Appendix A**. The water was generally clear with no odours or sheens observed. Flow observations at overland flow locations (SW019, SW025, SW027) and drain sampling locations (SW017, SW018) are summarised in **Table 8**.

Refer to **Figure 3** and **Figure 4**, **Appendix A** for sampling locations. Flowing water was present at creek sampling locations (SW004, SW005, SW006, SW007, SW008, SW009, SW012, SW013, SW014 and SW016). Still water was present at dam sampling locations (SW021, SW022, SW023).

Table 8 Summary of Surface Water Flow Observations

Sampling Event	Sampling Location	Observation
May 2022	SW017	Turbid water, free flowing.
	SW018	Water was flowing in the drainage channel.
	SW019	Pooled water was present.
	SW025	Water was flowing through the drainage channel from the dam into the waterway.
	SW027	Water was flowing through the channel.
October 2022	SW017	Water was flowing in the drainage channel.
	SW018	Water was flowing in the drainage channel.
	SW019	Pooled water was present. No flow.
	SW025	Water was flowing through the drainage channel from the dam into the waterway.
	SW027	Water was flowing through the channel.

6.3.3 Surface Water Analytical Results

Surface water analytical results are presented in **Table T4** and in **Appendix B.** Monitoring activities are summarised in the sampling event factual reports in **Appendix D**. Surface water results for sum of PFHxS and PFOS are presented in **Figure 9** (for May 2022) and **Figure 10** (for October 2022) in **Appendix A**. Note that not all surface water sampling locations are shown on these plans for privacy reasons.

A summary of surface water analytical results is provided in **Table 9** below. There were no first-time detections or new exceedances of HEPA (2020) guideline values in surface water samples collected in May and October 2022.

Table 9 Summary of PFAS in Surface Water in 2022

Event	No. of Samples	Compound	Concentration Range (µg/L)	No. of Sample Locations with > LOR	New maximum (µg/L)
May 2022	18	PFOS	<LOR – 0.0157	3	0.0043 µg/L (SW023)
		PFOA	<LOR	0	None
		PFOS+PFHxS	<LOR – 0.0354	3	0.0117 µg/L (SW023)
October 2022	18	PFOS	<LOR – 0.012	4	None
		PFOA	<LOR	0	None
		PFOS+PFHxS	<LOR– 0.01	4	None

Overall, the 2022 dataset is consistent with historical data. The interpretation of the results is discussed in **Section 7.4**.

6.4 Sediment Analytical Results

PFAS were not detected in any sediment sample analysed in 2022, refer to **Table T5**, **Appendix B**. Sum of PFHxS and PFOS concentrations in sediment samples in May 2022 are presented in **Figure** 11, **Appendix A**.

6.5 Wastewater Results

6.5.1 Wastewater Quality Parameter Field Measurement

Wastewater quality parameters were measured prior to collecting samples. The readings from the May, August and October 2022 sampling events[2] are presented in the sampling event factual reports (**Appendix D**) and in **Table T6**, **Appendix B**. A summary of the water quality parameters in the sampling events is presented in **Table 10**.

Table 10 Summary of Wastewater Quality Parameter Field Measurement Results: May and October 2022

Parameter	Units	10 May 2022	October 2022
pH	-	8.6	7.02
Temperature	ºC	21.9	22.1
DO	mg/L	4.63	3.57
ORP	mV	794	309.6
EC	µS/cm	1549	502.3

Based on the results the wastewater can be characterised as near neutral to slightly alkaline, moderately oxygenated, mildly reducing and fresh to brackish. These results are consistent with previous results (AECOM, 2020a, AECOM 2022d).

6.5.2 Wastewater Analytical Results

Wastewater analytical results are presented in **Table T7** in **Appendix B** and monitoring activities are summarised in the sampling event factual reports in **Appendix D**. A summary of wastewater analytical results is provided in **Table 11** below.

Table 11 Summary of PFAS in Wastewater in 2022

Event	No. of samples	Compound	Concentration Range (mg/kg)	Locations with > LOR	New minimum	New maximum
May 2022	1	PFOS	0.01	1	None	None
		PFOA	<0.01	0	None	None
		PFOS+PFHxS	0.01	1	None	None
August 2022	1	PFOS	<0.01	0	None	None
		PFOA	<0.01	0	None	None
		PFOS+PFHxS	0.02	1	None	None
October 2022	1	PFOS	<0.01	0	None	None
		PFOA	<0.01	0	None	None
		PFOS+PFHxS	0.02	1	None	None

Overall, the 2022 dataset was consistent with historical data. No new minimum or maximum concentrations were recorded.

[2] Parameters were not measured in August 2022 as a functioning YSI was not available.

7.0 Discussion / Interpretive Analysis

7.1 Hydrogeology

All monitoring wells sampled were located in the southern portion of the Base between Camp Kerr, and Snapper Creek / Tin Can Inlet (WBTA's eastern boundary).

The inferred groundwater flow directions in May 2022 and October 2022 were consistent with the previously inferred groundwater flow directions (AECOM, 2020a and AECOM, 2022d). The groundwater elevation data indicate groundwater to the east of Camp Kerr flows towards the north-east in the direction of the coast. There appears to be a groundwater divide situated in the centre of Camp Kerr that affects the local groundwater flow directions. The divide is likely to reflect the topography of the area with Camp Kerr located at a topographic high point. Groundwater flow in the eastern portion of Camp Kerr (i.e. in the vicinity of the caretaker's residence) has been inferred to be towards the east (i.e. on-Base). Groundwater in the western portion of Camp Kerr (i.e. around the WWTP and POL) appears to flow to the west or south-west towards Wallu. Local groundwater flow in the southern portion of Camp Kerr is inferred to be towards the south. This indicates that the township of Wallu is hydraulically down-gradient of the western portion of the Camp Kerr.

7.2 Groundwater Results

PFAS concentrations in 2022 were generally similar to previous (historical) results presented in the DSI (AECOM, 2020a) and monitoring results from 2020 to 2021 (AECOM, 2022d).Sum of PFHxS and PFOS in groundwater in 2022 are shown in **Figure 9** and **Figure 10** in **Appendix A**. The groundwater results have been broken down into the following four discrete areas for further discussion:

- Eastern portion of Camp Kerr
- Western portion of Camp Kerr
- Deeper extraction bores at Camp Kerr
- Remaining Base area.

7.2.1 Eastern Portion of Camp Kerr

Elevated PFAS concentrations were detected in groundwater in the eastern portion of Camp Kerr in the vicinity of the caretaker's residence with sum of PFHxS and PFOS concentrations exceeding the drinking water guideline value (HEPA, 2020) in two monitoring wells (MW121 and MW122) in both May and October 2022 sampling events. Sum of PFHxS and PFOS was not detected in any other monitoring well in the eastern portion of Camp Kerr. The non-detection of PFAS in monitoring wells down- and cross-gradient of MW121 and MW122 indicates the extent of PFAS in groundwater is localised, relatively stable and unlikely to be migrating off-Base. The potential for unacceptable off-Base risks to human health from localised PFAS concentrations in the eastern portion of Camp Kerr is considered low and the risk profile is unchanged.

The historical source of the PFAS in groundwater at this area is not known. The DSI (AECOM, 2020a) identified one possible source to be the historical irrigation of treated water containing PFAS, from the WWTP. Water from the WWTP is irrigated to ground at three areas at Camp Kerr: a location adjacent to the WWTP and two areas close to the entrance road where MW121 and MW122 are located (refer to **Section 2.1**). During the monitoring period, analytical results on samples of treated water (OTH001) indicated PFOS or PFHxS concentrations close to, or below, the limit of reporting. The results do not indicate a significant source of PFHxS and PFOS is present in the water irrigated to ground.

7.2.2 Western Portion of Camp Kerr

PFAS were not detected in the western portion of Camp Kerr. Sum of PFHxS and PFOS in off-Base monitoring well MW118, located within the MA, to the south of Camp Kerr, was reported at 0.09 µg/L and 0.04 µg/L in May 2022 and October 2022 sampling events, respectively. The concentration recorded in May 2022 exceeded the human health guideline values for drinking water (HEPA, 2020) for the first-time. A quality assurance sample collected from MW118 in May 2022 and analysed at the secondary laboratory (NMI) reported a lower concentration (0.04 µg/L), which may indicate the primary

sample concentration (analysed by ALS) to be anomalous. As the October 2022 results for sum of PFHxS and PFOS at MW118 are consistent with historical results and below the HEPA (2020) drinking water guidelines, there is no change in the risk profile.

PFAS were not detected in groundwater samples collected from off-Base wells (MW116 and MW117), located beyond the western Base boundary. PFAS has never been detected at these wells since their installation in 2019 indicating that PFAS in groundwater is not migrating off-Base to the west towards Wallu.

As PFAS was not detected in groundwater in the monitoring wells between Camp Kerr and Wallu or in wells located along the western Base boundary in Camp Kerr, the off-Base risk to human health from the detections of PFAS at MW118 remains low and the risk profile is unchanged.

7.2.3 Deeper Extraction Bores at Camp Kerr

Two on-Base water supply bores were sampled. Bore 1 (POT001) is screened between 18 and 78.4 mbgl and Bore 2 (POT005) is screened between 30 and 51.5 mbgl. PFAS were detected in groundwater from both bores in 2022. PFHxS was detected in POT001 at 0.03 µg/L in both May and October 2022 events and in POT005 in May 2022 (at 0.02 µg/L). Historically, PFAS have been detected at various times in both wells since 2018 at concentrations close to the limit of reporting. This indicates residual PFAS concentrations are present in the aquifer at these locations. Due to the length of the screened section in Bore 1, there is the potential for different sections of the aquifer to be connected or connection between different aquifers, if present. There is no change to the risk profile.

7.2.4 Remaining Base Area

PFAS were not detected in groundwater samples from monitoring wells located across the central and eastern portions of the southern area of the Base with the exception of PFOS detected at 0.02 µg/L in groundwater from MW109 in May 2022. The result marginally exceeded the limit of reporting. MW109 is located along the eastern boundary of the Base. PFAS were not detected at MW109 in October 2022. The detection is considered to be a potential false positive and not indicative of a local PFAS source as PFAS has not historically been reported at this location.

Monitoring well MW109 is located close to Schnapper Creek (approximately 30 m distance) and groundwater may be hydraulically connected with surface water in this area. Surface water in Schnapper Creek at SW013, close to the location of MW109, has frequently reported PFOS detections, which has been attributed to off-Base sources in Tin Can Bay (such as the waste management facility), although it is noted that PFOS was not detected in SW013 collected in May 2022.

As the detection of PFOS at MW109 in May 2022 was close to the limit of reporting and not repeated in the October 2022 event, overall, the results are consistent with previous results. On-Base source areas of PFAS are unlikely to be present in the central and eastern portions of the southern portion of the Base. PFAS detections are considered to be from legacy diffuse sources and not directly attributed to a direct source area. There is no change to the risk profile.

7.3 Groundwater Temporal Analysis

A graph showing the historical results for sum of PFHxS and PFOS in groundwater from selected monitoring wells from the Camp Kerr area and the south-eastern portion of the Base is shown in **Chart 1**. The graph includes all monitoring wells that have recorded detectable concentrations of PFAS since monitoring commenced in 2018. The graph indicates groundwater concentrations show steady or slightly decreasing concentrations, which suggests ongoing attenuation of PFAS concentrations. Sum of PFHxS and PFOS concentrations in MW118 showed an increase in May 2022 as discussed in **Section 7.2.2**, however, the concentrations decreased to approximately the historical range in October 2022.

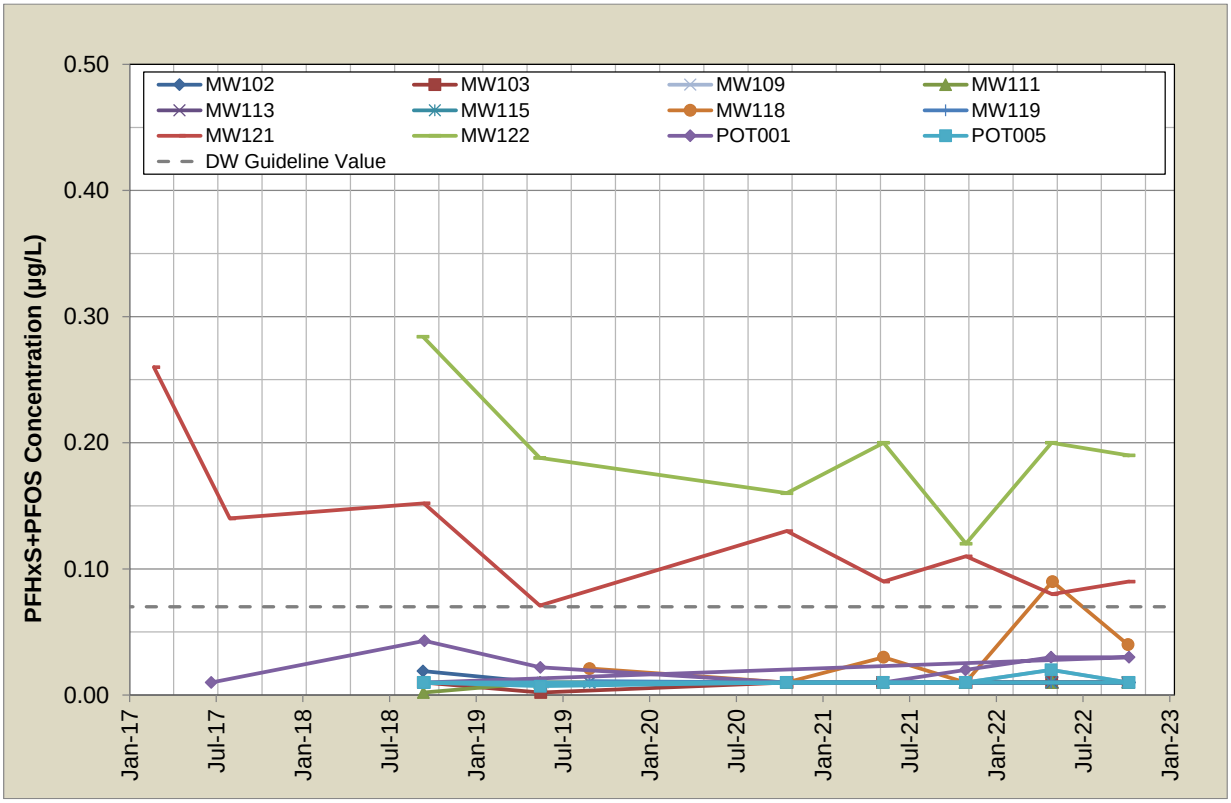


Chart 2 Sum of PFHxS and PFOS in selected monitoring wells: 2017 to 2022

There are currently insufficient data to complete statistical analysis as a minimum of eight datapoints is required. As more data becomes available, statistical analysis may be included in future reports where appropriate.

7.4 Surface Water Results

Surface water results for sum of PFHxS and PFOS in May 2022 and October 2022 are provided in **Figure 9** and **Figure 10**, respectively, in **Appendix A**.

7.4.1 Drainage features around Camp Kerr

Three drainage features were sampled during the monitoring events including:

- Ponded water and sediment from an unlined stormwater channel to the south of the caretaker's residence (SW017/SD017).
- Ponded water and sediment from an unlined stormwater channel to the south-east of the water treatment plant (SW018/SD018). The channel receives water from the vehicle wash point and runs down the slope into vegetation along the western side of Camp Kerr.
- Ponded water and sediment along the perimeter track immediately adjacent to the Base's western boundary (SW019/SD019). The water was considered likely to be sourced from overland flow from Camp Kerr.
- Ponded water and sediment at an off-Base sampling location adjacent to Clyde Road at the base of the slope prior to the water discharging into a private dam (SW027/SD027).

PFAS has been consistently detected at the on-Base ponded water sample location SW019, located along the western Base boundary perimeter track. Concentrations of sum of PFHxS and PFOS in both sampling events in 2022 were approximately 0.03 µg/L which is less than the historical concentration of 0.116 µg/L, recorded in 2019.

Sampling location, SW027, is downstream of SW019. PFAS were detected in both sampling events in 2022 with relatively lower sum of PFHxS and PFOS concentrations (0.01 µg/L) detected compared to

SW027. The detection of PFAS in ponded water at SW019 and SW027 indicates the presence of an overland flow pathway for the migration of PFAS from Camp Kerr to beyond the western Base boundary.

PFAS have been less frequently detected at the two on-Base stormwater channel locations (SW017 and SW018) with PFAS not detected in surface water samples from either location since May 2021.

7.4.2 Surface Water Bodies in Wallu

During the monitoring period, PFAS were detected in one (SW023) of the three surface water samples (SW021 to SW023) collected from two off-Base private dams in the eastern portion of Wallu (i.e. west of Camp Kerr). PFHxS and PFOS were detected at SW023 in May 2022 (0.0117 µg/L) (a new maximum), but not detected in October 2022 (<0.0002 µg/L). The concentrations show variability which may reflect the changing flow conditions within the off-Base dam or changes due to rainfall or evaporation.

PFAS were detected in the surface water sample collected from the ephemeral waterway (SW025), which is connected to, and drains some of the dams. Historically, PFAS have been infrequently detected in four off-Base private dams (at locations SW020 to SW024) and the ephemeral waterway (SW025), which indicates a potential PFAS migration pathway from the Base into off-Base dams, via overland flow pathways. The possibility of unknown off-Base sources affecting off-Base areas (e.g. use of foam for bushfires) cannot be discounted.

7.4.3 Creeks on the Base

Two of the surface water sampling locations (SW012 [Kauri Creek] and SW016 [Schnapper Creek]) are located within the Ramsar area shown on **Figure 3**, **Appendix A**. PFAS were not detected at these locations in 2022.

Sampling locations SW013 and SW014 are located along a tributary of Schnapper Creek upstream of the Ramsar area and are representative of water entering the Ramsar area from the Base. SW013 and SW014 are located approximately 600 m and 1.3 km, respectively, upstream of the Ramsar area associated with Tin Can Bay. During the October 2022 sampling event, PFAS were detected at both locations: SW013 (0.009 µg/L sum of PFHxS and PFOS in October 2022) and SW014 (0.003 µg/L, PFHxS in October 2022). PFAS were not detected during the May 2022 sampling event. These concentrations slightly exceeded the HEPA (2020) ecological guideline value for 99% species protection (0.00023 µg/L).

PFAS were not detected at any other surface water sampling location, along Kauri Creek, Mosquito Creek, and Kangaroo Creek.

The detectable PFAS concentrations along Schnapper Creek may indicate the potential for relatively minor source(s) of PFAS in the eastern portion of the Base, however no primary sources of PFAS have been identified in this area. The presence of off-Base PFAS sources near Tin Can Bay including the waste transfer station, sewage treatment works and fire station, which are located on the eastern side of Snapper Creek, have the potential to contribute PFAS to the environment in the estuarine Snapper Creek system (at SW013 and SW014) and the Ramsar area.

7.5 Surface water - Temporal Trends

Chart 3 shows the change in sum of PFHxS and PFOS concentration in surface water in the on-Base drainage features, on-Base creeks and off-Base dams and waterways. Only sampling locations that have recorded one or more detectable concentration have been included[3]. Overall, sum of PFHxS and PFOS concentrations are steady to decreasing. Higher variability is present at SW019, which is a sampling location of ponded water along the western Base boundary with lower sum of PFHxS and PFOS concentrations detected from 2020 to 2022 compared to 2019 when sampling first began. There does not appear to be any seasonal changes or changes in response to rainfall in the dataset.

[3] As discussed in the DSI (AECOM, 2020a), PFAS concentrations reported in a monitoring event conducted in March 2017 by a Defence contractor (Golder, 2017) have been discounted as they are considered anomalous and not representative of PFAS concentrations. Only results obtained during the environmental investigations (AECOM, 2019, AECOM, 2020a) and OMP sampling events (AECOM, 2021b,c) have been considered.

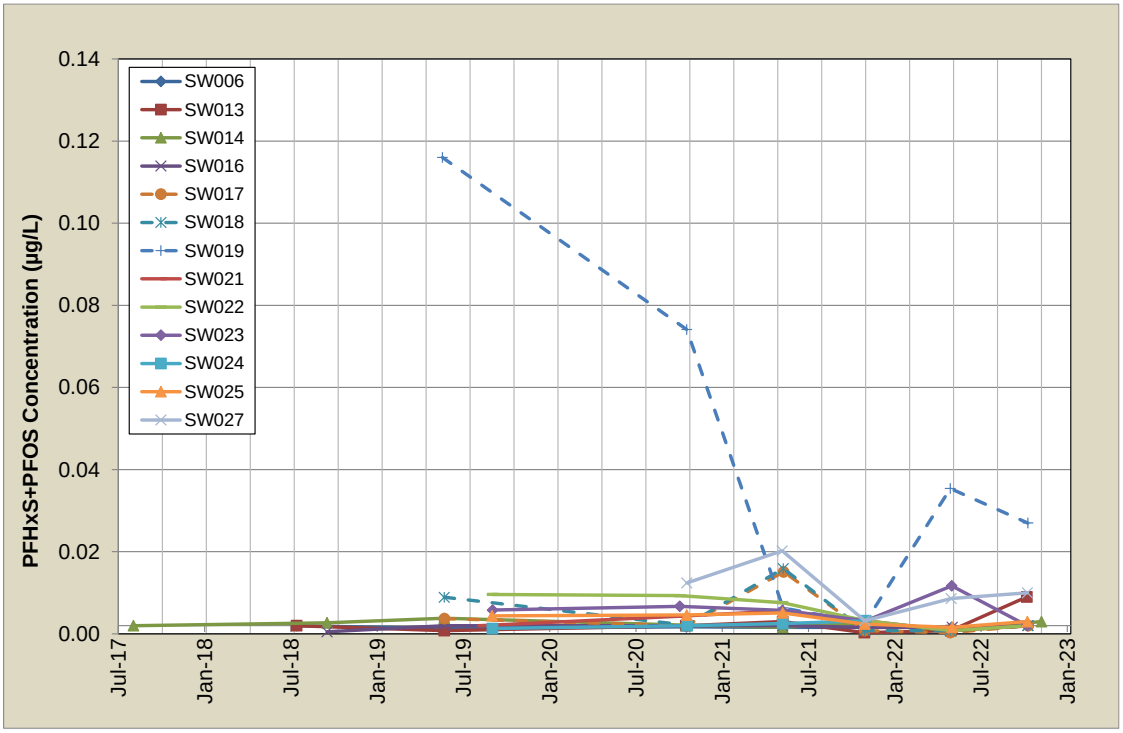


Chart 3 Sum of PFHxS and PFOS in selected sampling locations: 2017 to 2022

All sum of PFHxS and PFOS concentrations are more than one order of magnitude below the recreational water guideline value (HEPA, 2020) indicating there are no unacceptable risks to human health. The HEPA (2020) ecological guideline value for PFOS for the protection freshwater species was exceeded in four surface water samples from SW013 (Snapper Creek), SW023 (private dam in Wallu) and SW019 and SW027, which are overland flow locations. As results are within the historical range at these locations, there is no change to the risk profile.

7.6 Sediment Results

For the period from 2017 to 2022, seven sediment samples out of a total of 58 samples analysed have reported detectable concentrations of PFAS. A summary of sum of PFHxS and PFOS results for the different surface water features for the period 2018 to 2022 is shown in **Table 12**.

Table 12 Summary of Sediment Results: 2017 to 2022

Location	2017 to 2022		Number of samples exceeding the limit of reporting
	Sample numbers	Range of sum of PFHxS+PFOS (mg/kg)	
On-Base Drainage Channels (Camp Kerr)	7	<0.0002 to 0.0008	1
Off-Base dams/waterways	12	<0.0002 to 0.0012	4
On-Base Creeks	39	<0.002 to 0.0003	2

The rare detection of PFAS in sediment samples reflect the low PFAS concentrations detected in surface water samples. No guideline values are available for sediment, but the non-detection of PFAS suggests a low risk to freshwater ecosystems.

8.0 Discussion

8.1 Conceptual Site Model

The CSM was developed during the investigation stages (AECOM, 2020a) and summarises the linkages between the sources, exposure pathways and receptors.

The five OMP sampling events completed since the DSI have provided additional data to further understand the changing PFAS in groundwater conditions (concentration and shape) of the area of groundwater impacted by PFAS within the WBTA MA.

The data presented in this report on the primary and secondary PFAS sources, pathways and receptors does not change the understanding of the CSM and therefore no updates to the CSM are required. Future monitoring will be used to re-evaluate and identify potential changes to the CSM understanding as more data becomes available.

8.2 Risk Profile

The data collected to date suggest that the risk profile to human health within the WBTA MA is unchanged, based on the following conclusions of the data assessment:

- The extent of PFAS in groundwater is similar to that presented in the DSI (AECOM, 2020a) with the exception of sum of PFHxS and PFOS in groundwater from off-Base monitoring well, MW118, which exceeded the HEPA (2020) human health drinking water guideline in May 2022. Whilst the October 2022 sample had decreased to historical concentrations, close to the limit of reporting, there are no additional down-gradient wells to the south of MW118 to determine the extent of the PFAS in groundwater.
- There were no other first-time detections or new exceedances of the HEPA (2020) groundwater human health guideline values except for one first-time detection of PFOS in the sample from MW109 in May 2022. However, as the concentration was close to the laboratory limit of reporting and PFAS were not detected in the well in October 2022, this indicates the result is potentially a false positive.
- PFAS concentrations from surface water samples were generally similar to previous (historical) results. There were no first-time PFAS detections or new exceedances of HEPA (2020) human health guideline values in surface water samples during 2022.
- PFAS were not detected at concentrations exceeding the laboratory limit of reporting in sediment samples collected from sampling locations in the MA in 2022.

Based on the data, AECOM considers that the conclusions made regarding risk in the DSI (AECOM, 2020a) are unchanged.

8.3 Assessment of Current OMP

Following a review of data collected during the current 2022 monitoring period, there has been no significant change to the understanding of risks associated with PFAS in the WBTA MA, spatial distribution of PFAS and the need for monitoring of additional media. Furthermore, there have been no changes in land use.

An OMP review was recommended in the 2021 AIR (AECOM, 2022d). This review was completed in February 2023 (AECOM, 2023). The following updates were recommended to the OMP sampling program for the biannual sampling event from April 2023:

- removal of six groundwater monitoring wells and six co-located surface water and sediment sampling locations from the sampling program at locations where PFAS have generally not been detected during the monitoring conducted to date. This optimises the sampling program by focusing on the sample locations where PFAS have been detected. This includes the removal of surface water and sediment samples from two off-Base dams on private properties. Replacement locations were not required as downstream sampling locations are suitably located to provide monitoring information.

- Removal of the requirement for sampling of the WWTP during a time representative of high site usage. Sampling to date has not indicated any difference in wastewater quality between periods of high and low site usage so no further *ad hoc* wastewater sampling events are required.

The table below summarises the proposed changes to the number of sampling locations in the OMP. Updated sampling locations for the WBTA Management Area and Camp Kerr are shown in **Figure 12** and **Figure 13** in **Appendix A**, respectively.

Table 13 Summary of proposed changes to the OMP

Media	No. of samples in OMP in 2022	No. of samples in OMP in 2023	Change
Groundwater	24	18	Removal of seven locations (MW103-105, MW107-108 and MW110).
Surface Water / Sediment	20	14	Removal of six locations (SW/SD004-005, SW/SD008, SW/SD012, SW/SD020, SW/SD024).
Wastewater	1	1	No change.

9.0 Conclusions

Groundwater, surface water and sediment sampling was completed as part of the OMP between May and October 2022.

Concentrations of PFAS in groundwater were consistent with historical results. In particular:

- In the eastern portion of Camp Kerr, elevated PFAS concentrations (exceeding HEPA (2020) human health guideline values) were detected at two monitoring wells (MW121 and MW122) close to the Base entrance road. The non-detection of PFAS in monitoring wells down- and cross-gradient of MW121 and MW122 indicates the extent of PFAS in groundwater is localised and that the PFAS concentrations are stable and unlikely to be migrating off-Base.
- In the western portion of Camp Kerr, the non-detection of PFAS in wells on-Base and off-Base beyond the western Base boundary shows that PFAS is not migrating in groundwater to the west towards Wallu. PFAS have been consistently detected in an off-Base monitoring well adjacent to the southern boundary (MW118) with the concentration of sum of PFHxS and PFOS in May 2022 exceeding the drinking water guideline (HEPA, 2020). In October 2022, sum of PFHxS and PFOS had decreased below the guideline and was similar to the historical range. Overall, the results do not indicate the risk profile has changed.
- Consistent with the results of the DSI (AECOM 2020a) and the 2021 AIR (AECOM, 2022d), PFAS were, with one exception, not detected in groundwater samples from bores at other locations across the southern portion of the WBTA MA, located near landfilling areas, the airfield where refuelling activities occurred and where groundwater may discharge to surface water. The exception was the sample from MW109 in May 2022, which reported a PFOS concentration marginally above the limit of reporting. The results indicate source areas of PFAS are unlikely to be present in these areas.

Concentrations of PFAS in surface water and sediment were consistent with historical results. The key conclusions are as follows:

- In the Camp Kerr and Wallu area, PFAS were detected in on-Base drainage features and off-Base dams and ephemeral watercourses indicating a line of evidence for the presence of an overland flow pathway for PFAS in surface water on-Base to migrate to surface features in Wallu. Concentrations detected during the monitoring period did not exceed HEPA (2020) human health guideline values and therefore the results do not indicate the risk profile has changed.
- Two surface water samples collected from a tributary of Schnapper Creek in the southern portion of the Base reported detectable concentrations of PFOS in the monitoring period, which exceeded the HEPA (2020) ecological guideline for freshwater 99% species protection. These concentrations may indicate the potential for relatively minor source(s) of PFAS in the eastern portion of the Base. The presence of potential off-Base PFAS sources near Tin Can Bay including the waste transfer station, sewage treatment works and fire station, which are located to the east of the eastern Base boundary are considered to have the potential to contribute PFAS to the environment in the estuarine Schnapper Creek system and Ramsar area. Concentrations were consistent with historical results and do not indicate the risk profile has changed.
- PFAS were not detected in any sediment sample collected from the MA in 2022.

The CSM for WBTA MA was reviewed and no changes were identified to sources, pathways or receptors. Based on the data, no changes to the risk profile are recommended.

A review of the OMP was completed in February 2023. The review recommended the removal of six groundwater monitoring wells and six surface water and sediment sampling locations with the updated program to be implemented in April 2023.

10.0 References

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List of Appendices

Appendix A **Figures**

Appendix B **Tables**

Appendix C **Infrastructure Projects at Wide Bay Training Area in 2022**

Appendix D **Sampling Event Factual Reports**

Appendix E **Sampling Analysis and Quality Plan**

Appendix A

Figures

Appendix A Figures

G:\ENV\GIS\Projects\605\60580555 Wide Bay Training Area\FIGURES\60580555 F2 Investigation Area 08 01 2020 TO Rev B

AECOM Imagine it. Delivered.

LOCATION OF WBTA AND MANAGEMENT AREA

Annual Interpretative Report - 2022 -
PFAS OMP - WBTA, Queensland

FIGURE 1

G:\ENV\GIS\Projects\605\60580555 Wide Bay Training Area\FIGURES\605805555\PMAP_Figure 3 Site Features 08/05/2020 JP Rev 1

AECOM Imagine it. Delivered.

Definitions
UOTF – Urban Operations Training Facility
AGR – Assault Grenade Range
SGR – Standard Grenade Range
MUFP - Multi User Firing Point
MCR – Multi Classification Range
ECR – Electronic Classification Range
BIF – Battle Inoculation Facility

BASE FEATURES

Annual Interpretative Report - 2022 -
PFAS OMP - WBTA, Queensland

FIGURE 2

Pioneer Point Boat Ramp
Tin Can Bay
Inskip
Pannikin Island
UOTF/EHTA
Demolition Range
SW/SD012
Old Boat Ramp/Sentry Post
White Sloop Creek
Airstrip UAV
24m Tower
Wide Bay Training Area
SW/SD005
SW/SD008
Hospital Creek
Barlow Creek
Griffin Creek
Forward Operating Base
SW/SD009
Carlo Island
AGR/SGR/DFSW
SW/SD004
Kauri Creek
Hampton Creek
Easy Feature/MUFP/MCR/BIF
Paddle Point
Tin Can Inlet
Snapper Point
Smooger Point
Tin Can Bay
Quarry
Tin Can Bay Waste Transfer Station and Sewage Treatment Works
MW110
MW109
SW/SD013
SW/SD014
Ammunition Storage
Maryborough - Cooloola Road
Toolara
SW/SD007
Range/ECR
MW104
MW107
MW105
MW108
SW/SD006
MW103
Teewah Point
North Cooloola Point
Landfill 1
SW/SD016
Tin Can Bay Road
MW111
MW106
Area shown in Figure 4
Wallu
Wallu Heights
Rainbow Beach Road
Snapper Creek
Cooloola Cove
South Cooloola Point
Poverty Point
Tramwell Creek

KEY
- Wide Bay Training Area
- Investigation Area
- Great Sandy Strait Ramsar
- Parks and recreation reserves
- Major road
- Road
- Watercourse
- Surface water sample location
- Groundwater monitoring well location

0 2km

G:\ENV\GIS\Projects\60560580555 Wide Bay Training Area\FIGURES\60560555 F5 Sample Locations (Greater WBTA) 08 01 2020 TO Rev B

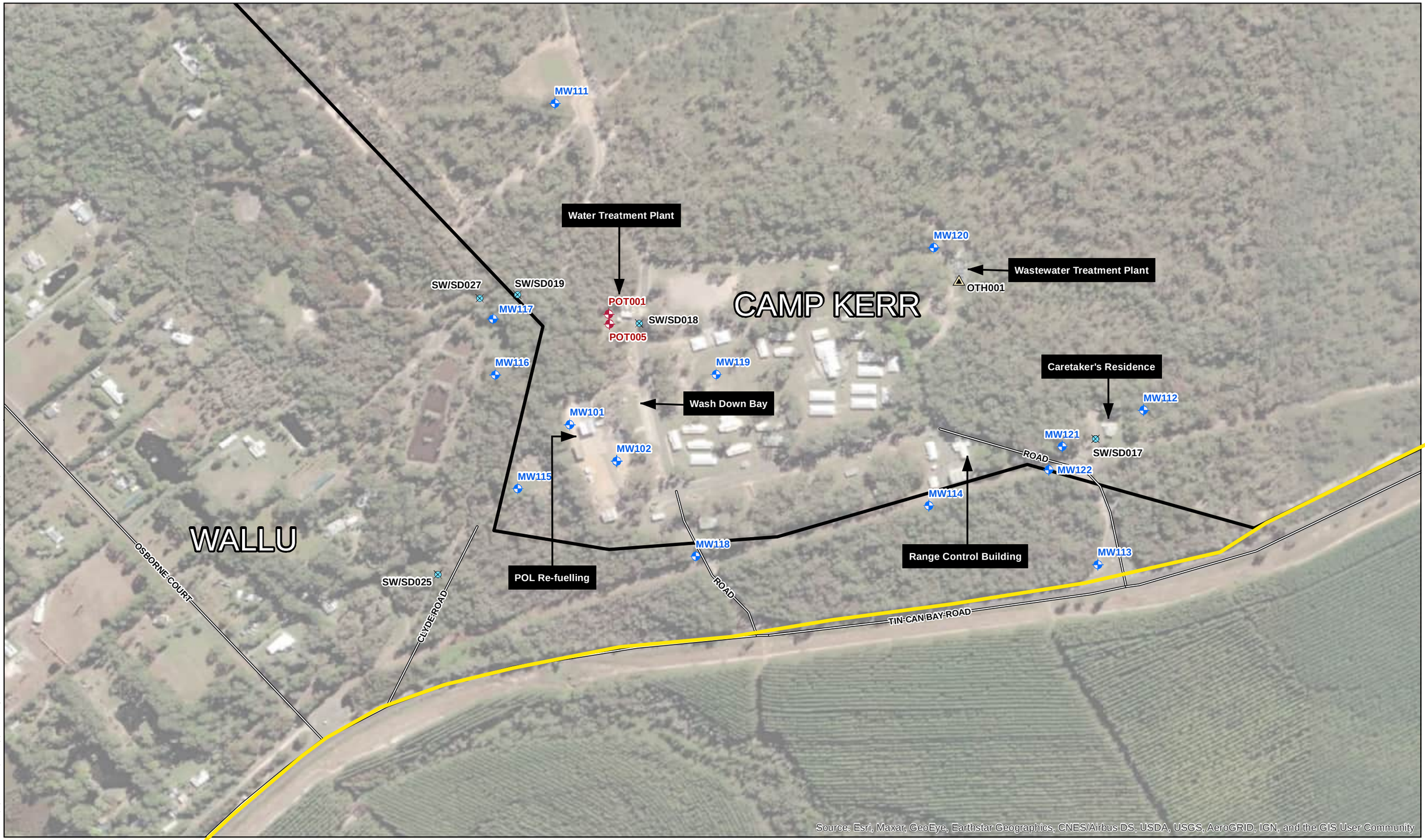
AECOM Imagine it. Delivered.

UOTF – Urban Operations Training Facility
AGR – Assault Grenade Range
SGR – Standard Grenade Range
MUFP - Multi User Firing point
MCR – Multi Classification Range
ECR – Electronic Classification Range
BIF – Battle Inoculation Facility

SAMPLING LOCATIONS (GREATER WIDE BAY TRAINING AREA)

Annual Interpretative Report - 2022 -
PFAS OMP - WBTA, Queensland

FIGURE 3



AECOM

N

DATUM GDA 1994, PROJECTION MGA ZONE XX

0 50 100 200

metres

1:4,500 (when printed at A3)

LEGEND

- Waste Water Treatment Plant Sampling Location
- Abstraction Bore
- Groundwater sampling location
- Sediment / surface water sampling location
- Road
- WBTA Property Boundary
- WBTA Management Area

Note that not all sampling locations are shown for privacy reasons.

Data sources:

Base Data: (c) 20XX (data source) (additional data)

Annual Interpretative Report - 2022 - PFAS OMP - WBTA, Queensland

SAMPLING LOCATIONS (CAMP KERR)

PROJECT ID	60612563
CREATED BY	PeacheyJ
LAST MODIFIED	SCS- 25/06/21
VERSION:	1

Figure

4

A3 size

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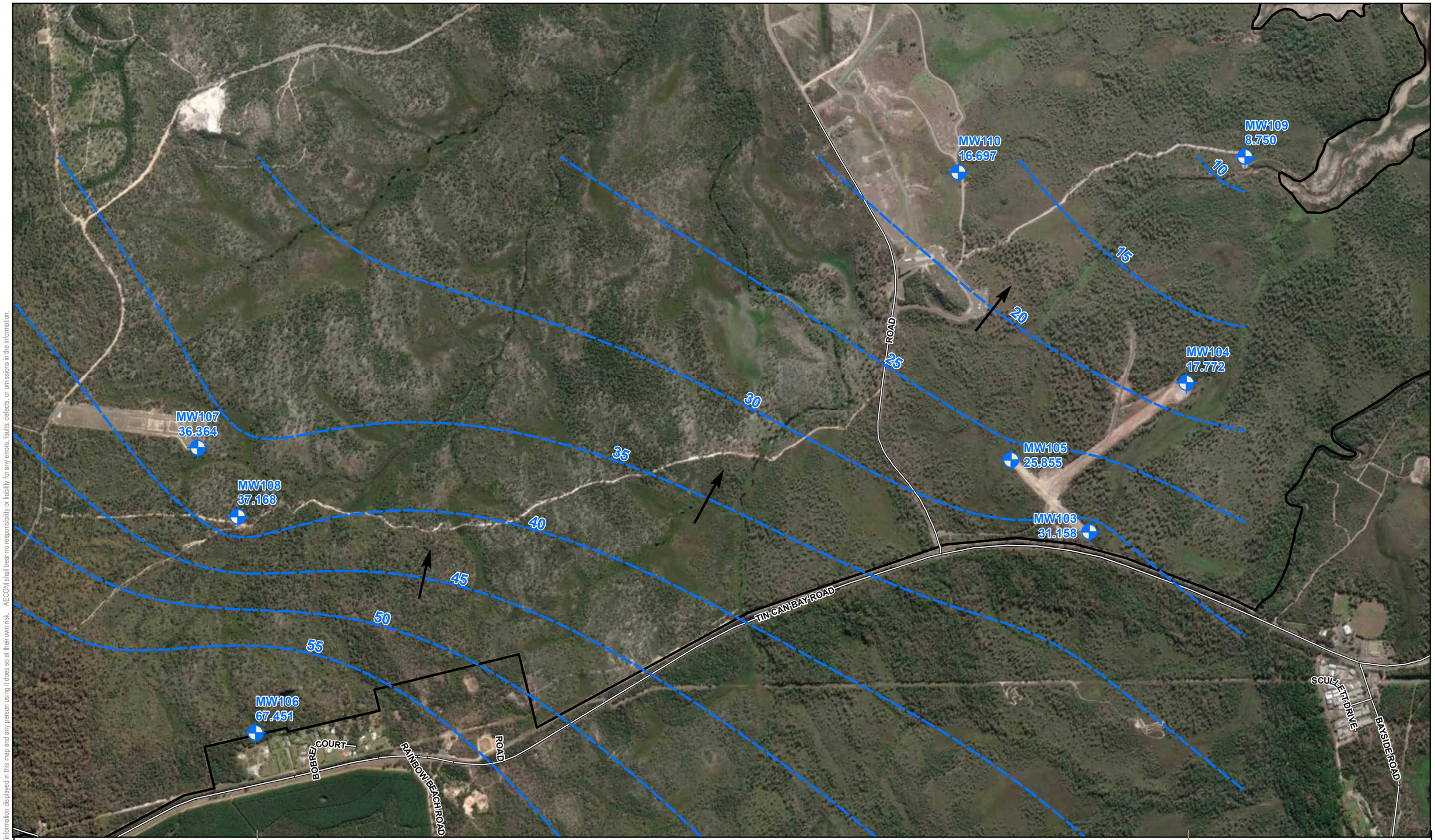

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AECOM

DATUM GDA 1994, PROJECTION MGA ZONE XX.

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metres

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LEGEND

- Groundwater elevation (mAHD)
- Groundwater elevation contours (mAHD)
- Inferred Groundwater Flow Direction

Data sources:

Base Data: (c) 20XX (data source) (additional data)

INFERRED GROUNDWATER CONTOURS, GREATER WBTA

09-13 May 2022

Annual Interpretative Report - 2022 - PFAS OMP - WBTA, Queensland

PROJECT ID	60612563
CREATED BY	JP
LAST MODIFIED	SCS- 06/06/22
VERSION:	1

Figure

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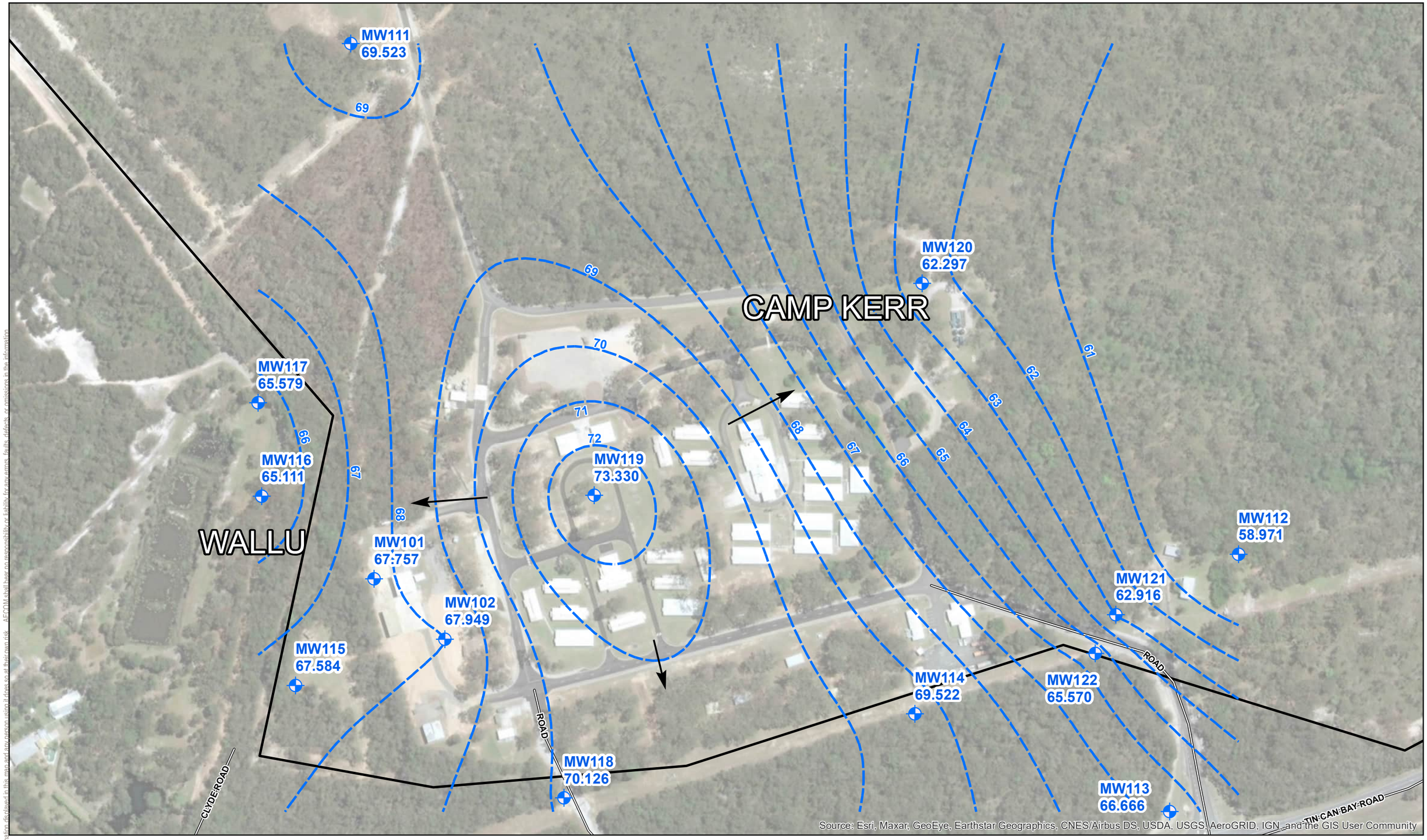

AECOM

N

DATUM GDA 1994, PROJECTION MGA ZONE XX

0 30 60 120

metres

1:2,685 (when printed at A3)

LEGEND

- Groundwater Elevation (mAHD)
- Inferred Groundwater Flow Direction
- Inferred Groundwater Contours (mAHD)
- WBTA Property Boundary

Data sources:

Base Data: (c) 20XX (data source) (additional data)

INFERRED GROUNDWATER CONTOURS (CAMP KERR) 09-13 May 2022

Annual Interpretative Report - 2022 - PFAS OMP - WBTA, Queensland

PROJECT ID	60612563
CREATED BY	JP
LAST MODIFIED	SCS- 06/06/22
VERSION:	1

Figure 6

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MW109 [8.429]
MW110 [16.716]
MW104 [17.206]
MW105 [26.057]
MW103 [30.695]
MW107 [35.135]
MW108 [34.907]
MW106 [66.956]

11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53 55 57 59 61 63 65 67 69 71

ROAD
TIN CAN BAY ROAD
RIFLEFISH ROAD
ROAD
SCULLETT DRIVE
BAYSIDE ROAD
BOBREL COURT
ROAD
RAINBOW BEACH ROAD
ROAD
ROAD

AECOM

N

DATUM GDA 1994, PROJECTION MGA ZONE XX.

0 200 400 800
metres

1:20,000 (when printed at A3)

LEGEND

- Groundwater elevation (mAHD)
- Inferred Groundwater Contours (mAHD)
- Inferred Groundwater Flow Direction
- WBTA Property Boundary

Data sources:

Base Data: (c) 20XX (data source) (additional data)

INFERRED GROUNDWATER CONTOURS, GREATER WBTA

9 November 2022

Annual Interpretative Report - 2022 - PFAS OMP - WBTA, Queensland

PROJECT ID	60612563
CREATED BY	SkipworthS
LAST MODIFIED	SCS- 28/06/21
VERSION:	1

Figure 7

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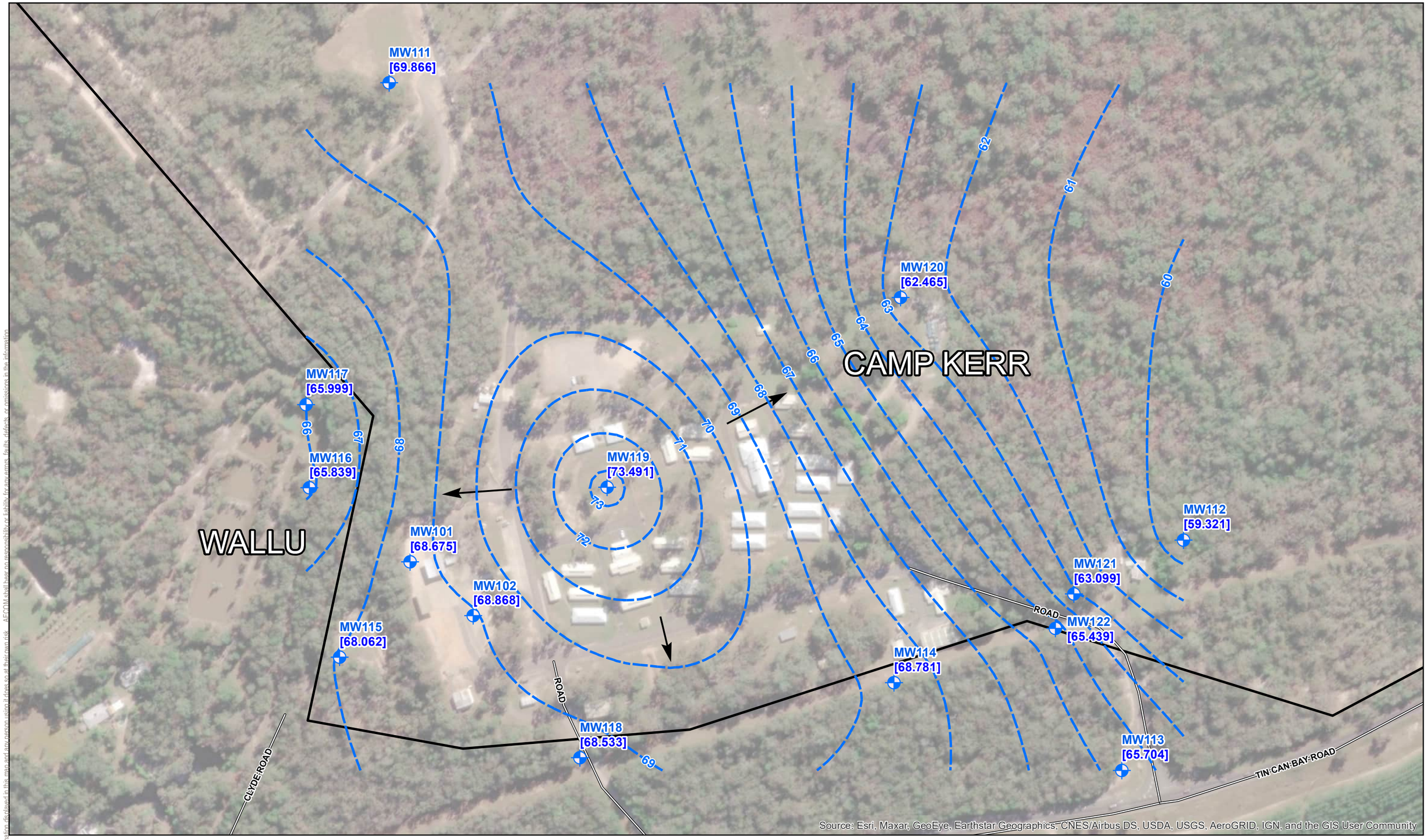

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DATUM GDA 1994, PROJECTION MGA ZONE XX

0 35 70 140

metres

1:3,000 (when printed at A3)

LEGEND

- Groundwater Elevation (mAHD)
- Inferred Groundwater Contours (mAHD)
- Inferred Groundwater Flow Direction
- WBTA Property Boundary

Data sources:

Base Data: (c) 20XX (data source) (additional data)

INFERRED GROUNDWATER CONTOURS (CAMP KERR) 9 November 2022

Annual Interpretative Report - 2022 - PFAS OMP - WBTA, Queensland

PROJECT ID	60612563
CREATED BY	ScottA3
LAST MODIFIED	SCS- 26/06/21
VERSION:	2

Figure 8

A3 size

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G:\ENV\GIS\Projects\605\60580555 Wide Bay Training Area\FIGURES\605805555\PMAP Figure 4 Sum of PFHxS and PFOS 08/05/2020 JP Rev 1

AECOM Imagine it. Delivered.

Definitions
UOTF – Urban Operations Training Facility
AGR – Assault Grenade Range
SGR – Standard Grenade Range
MUFP - Multi User Firing point
MCR – Multi Classification Range
ECR – Electronic Classification Range
BIF – Battle Inoculation Facility

SUM OF PFHxS AND PFOS IN GROUNDWATER AND SURFACE WATER MAY 2022

Annual Interpretative Report - 2022 -
PFAS OMP - WBTA, Queensland

FIGURE 9

INSET

Pioneer Point Boat Ramp

UOTF/EHTA

Demolition Range

Old Boat Ramp/Sentry Post

Airstrip UAV

24m Tower

Wide Bay Training Area

Australian Government Department of Defence

Mexmite Creek

Indaw Creek

Griffin Creek

Forward Operating Base

AGR/SGR/DFSW

TOOLARA STATE FOREST

Kurd Creek

Kangaroo Creek

Easy Feature/MUFP/MCR/BIF

Quarry

Ammunition Storage

600m Range/ECR

Landfill 1

Maryborough - Cooloola Road

SEE INSET

Wallu

Wallu Heights

Tinnanel Waterway

Rainbow Beach Road

Tin Can Bay Road

Snapper Creek

Tin Can Bay

Tin Can Bay Waste Transfer Station and Sewage Treatment Works

TIN CAN BAY STATE SCHOOL

CARAVAN PARK

TOOLARA GOLF COURSE

TOOLARA AIRPORT

Toolara

Cooloola Cove

Tin Can Bay

Inskip

Pannikin Island

Carlo Island

Carlo Point

Snapper Point

Smooger Point

Teewah Point

North Cooloola Point

South Cooloola Point

Poverty Point

KEY

- Wide Bay Training Area
- Management Area
- Major road
- Road
- Watercourse

Groundwater Analytical Results - PFOS + PFHxS (µg/L)

- >0.07
- LOR - 0.07
- <LOR

Surface water Analytical Results - PFOS + PFHxS (µg/L)

- >0.07
- LOR - 0.07
- <LOR

0 2km

G:\ENV\GIS\Projects\605\60580555\Wide Bay Training Area\FIGURES\605805555PMAP Figure 4 Sum of PFHxS and PFOS 08/05/2020 JP Rev 1

AECOM Imagine it. Delivered.

Definitions

UOTF – Urban Operations Training Facility
AGR – Assault Grenade Range
SGR – Standard Grenade Range
MUFP - Multi User Firing point
MCR – Multi Classification Range
ECR – Electronic Classification Range
BIF – Battle Inoculation Facility

SUM OF PFHxS AND PFOS IN GROUNDWATER AND SURFACE WATER OCTOBER 2022

Annual Interpretative Report - 2022 -
PFAS OMP - WBTA, Queensland

FIGURE 10

Wide Bay Training Area

Australian Government Department of Defence

Pioneer Point Boat Ramp

UOTF/EHTA

Demolition Range

Old Boat Ramp/Sentry Post

Airstrip UAV

24m Tower

Forward Operating Base

AGR/SGR/DFSW

Quarry

Easy Feature/MUFP/MCR/BIF

Ammunition Storage

600m Range/ECR

Landfill 1

Tin Can Bay Waste Transfer Station and Sewage Treatment Works

SEE INSET

Tin Can Bay

Tin Can Bay Road

Marlborough - Cooloola Road

Rainbow Beach Road

TOOLARA STATE FOREST

Little Stony Creek

Teebar Creek

Griffin Creek

Mexmite Creek

Kurd Creek

Kangaroo Creek

Snapper Creek

Tinnanel Waterway

Tin Can Inlet

Inskip

Pannikin Island

Carlo Island

Carlo Point

Snapper Point

Smooger Point

Toolara

Teewah Point

North Cooloola Point

South Cooloola Point

Poverty Point

Cooloola Cove

Wallu

Wallu Heights

TOOLARA AIRPORT

TOOLARA GOLF COURSE

TIN CAN BAY STATE SCHOOL

CARAVAN PARK

KEY

- Wide Bay Training Area
- Management Area
- Major road
- Road
- Watercourse

Sediment Analytical Results - PFOS + PFHxS (mg/kg)

- >0.07
- LOR - 0.07
- <LOR

0 2km

G:\ENV\GIS\Projects\605\60580555 Wide Bay Training Area\FIGURES\605805555\PMAP Figure 4 Sum of PFHxS and PFOS 08/05/2020 JP Rev 1

AECOM Imagine it. Delivered.

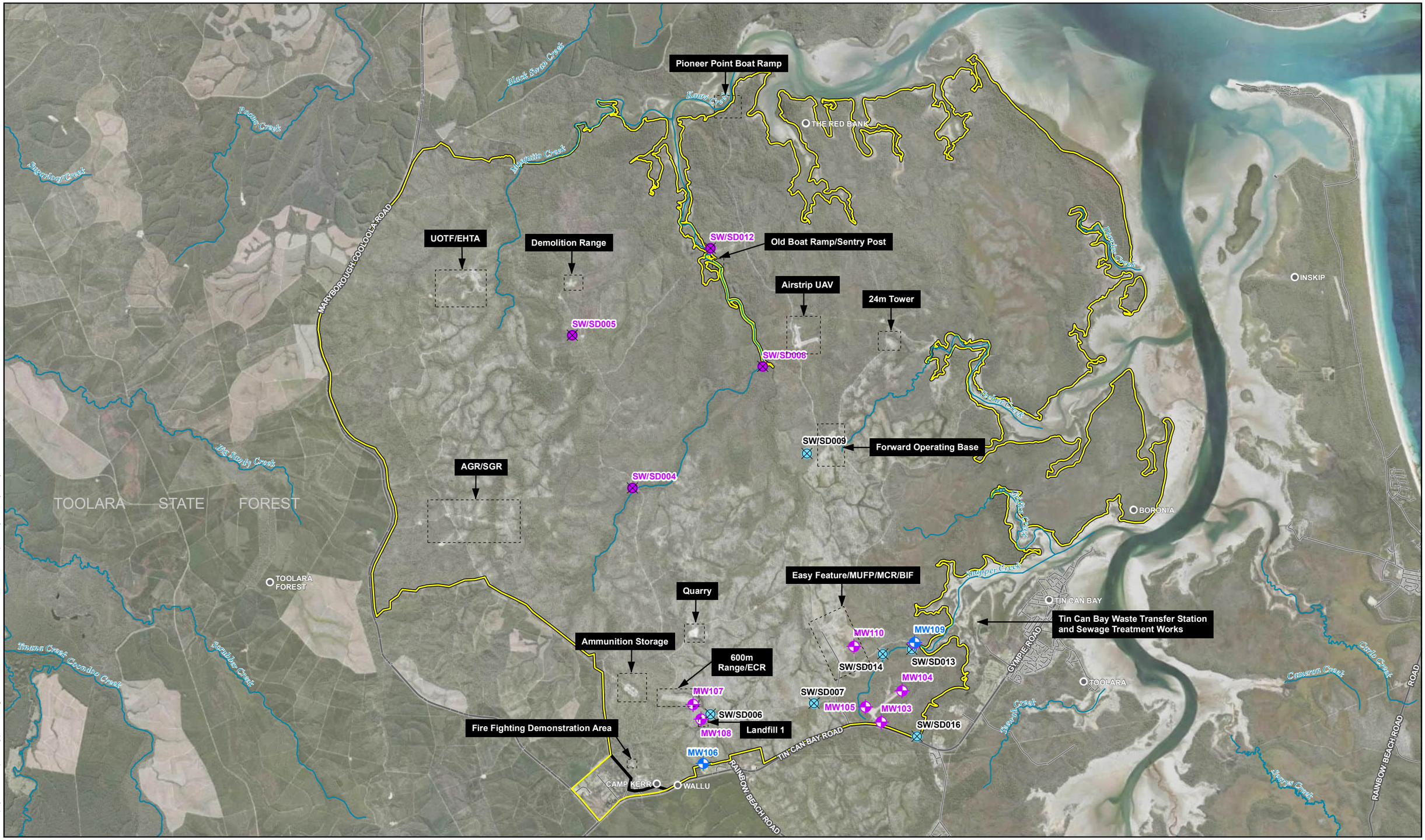
Definitions

UOTF – Urban Operations Training Facility
AGR – Assault Grenade Range
SGR – Standard Grenade Range
MUFP - Multi User Firing point
MCR – Multi Classification Range
ECR – Electronic Classification Range
BIF – Battle Inoculation Facility

SUM OF PFHxS AND PFOS IN SEDIMENT MAY 2022

Annual Interpretative Report - 2022 -
PFAS OMP - WBTA, Queensland

FIGURE 11



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AECOM

N

DATUM GDA 1994, PROJECTION MGA ZONE 56

0 0.5 1 2 3

km

1:80,000 (when printed at A3)

LEGEND

- Removed sediment / surface water sampling location
- Removed groundwater sampling location
- Retained groundwater sampling location
- Retained sediment / surface water sampling location
- Road
- WBTA Property Boundary
- WBTA Management Area
- Watercourse

UOTF - Urban Operations Training Facility
AGR - Assault Grenade Range
SGR - Standard Grenade Range
MUFP - Multi User Firing Point
MCR - Multi Classification Range
ECR - Electronic Classification Range
BIF - Battle Inoculation Facility
EHTA - Explosive Handling Training Area
UAV - Unmanned Aerial Vehicle

Data sources:

Base Data: (c) 20XX (data source) (additional data)

Wide Bay Training Area, Queensland

UPDATED SAMPLING LOCATIONS (WBTA Management Area)

Annual Interpretative Report - 2022 - PFAS OMP - WBTA, Queensland

PROJECT ID	60612563
CREATED BY	PeacheyJ
LAST MODIFIED	SCS- 25/06/21
VERSION:	1

Figure 12

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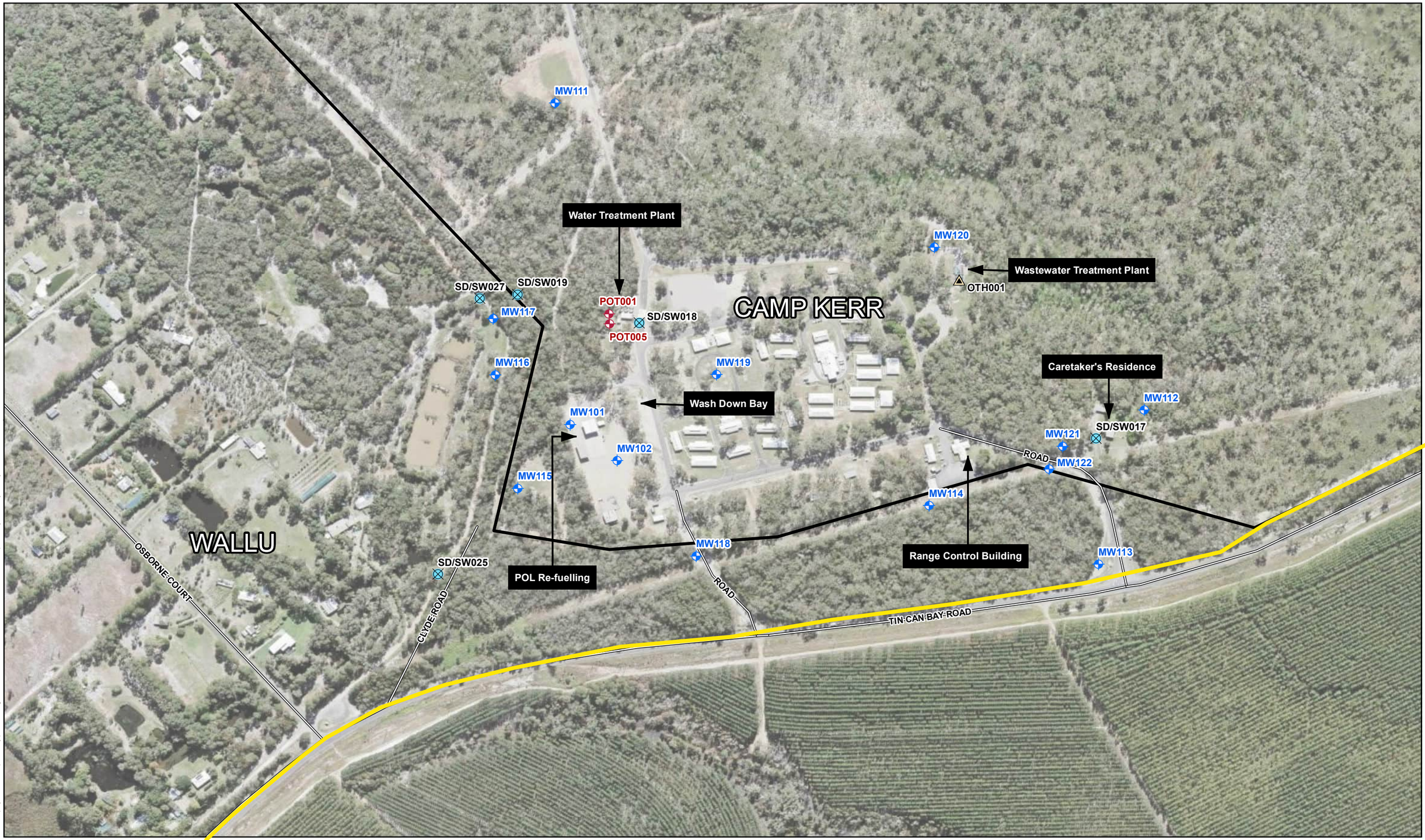

AECOM

N

DATUM GDA 1994, PROJECTION MGA ZONE 56

0 50 100 200

metres

1:4,500 (when printed at A3)

LEGEND

- Removed sediment / surface water sampling location
- Removed groundwater sampling location
- Retained Wastewater treatment plant sampling location
- Retained abstraction bore
- Retained groundwater sampling location
- Retained sediment / surface water sampling location
- Road
- WBTA Property Boundary
- WBTA Management Area

Note that not all sampling locations are shown for privacy reasons.

Data sources:

Base Data: (c) 20XX (data source) (additional data)

Wide Bay Training Area, Queensland

UPDATED SAMPLING LOCATIONS (Camp Kerr)

Annual Interpretative Report - 2022 - PFAS OMP - WBTA, Queensland

PROJECT ID	60612563
CREATED BY	PeacheyJ
LAST MODIFIED	SCS- 25/06/21
VERSION:	1

Figure 13

A3 size

Filename:L:\Secure\Projects\606X\60612563\900_CAD_GIS\920_GIS\02_MXDs\WBTA\PFAS_OMP_WBTA_AIR_2021\WBTA_P60612563_F3_OMP_Sampling_Locations_CampKerr.mxd

Appendix B

Tables

Appendix B Tables

Well ID	Sample Date	Screened Interval depth (mbgs)	Depth to Water (mbtoc)	TOC Elevation (mAHD)	Groundwater Elevation (mAHD)	Well Depth (mbtoc)	Condition of Stand up cover / Gatic	DO (mg/L)	EC (µS/cm)	pH	E_r (mV)	E_h (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method / Comments
MW101	29/10/2020	11 to 15	16.06	14.324	79.264	64.940	Good	1.47	167	4.53	205.1	410.1	24.2	Medium	Other	No odour	No sheen	Hydrasleeve
MW101	20/05/2021	11 - 15	16.2	14.112	79.264	65.152	Good	1.92	133	4.3	239	444	21.6	Clear	Clear	No odour	No sheen	Hydrasleeve
MW101	10/11/2021	11 - 15	15.655	79.264	63.609	16.08	Good	2.38	140	6.74	102.5	307.5	23.7	Turbid	Red	No odour	No sheen	Hydrasleeve
MW101	10/05/2022	11 - 15	11.507	79.264	67.757	16.08	Good	1.01	211	5.54	212	417	20.9	Medium	Clear	No odour	No sheen	Hydrasleeve
MW101	21/10/2022	11 - 15	10.589	79.264	68.675	16.08	Good	2.48	235.2	5.43	93.9	298.9	22.3	Slightly turbid	Cloudy, brown sediment	No odour	No sheen	Hydrasleeve
MW102	28/10/2020	14 to 20	-	-	78.564	-	Not found	-	-	-	-	-	-	-	-	-	-	Unable to be located
MW102	21/05/2021	14-20	-	-	78.564	-	Not found	-	-	-	-	-	-	-	-	-	-	Unable to be located
MW102	09/11/2021	14-20	14.171	78.564	64.393	19.91	Good	1.86	114.7	7.19	95.1	300.1	24.3	Clear	Clear	No odour	No sheen	Hydrasleeve
MW102	10/05/2022	14-20	10.615	78.564	67.949	19.91	Good	1.6	115	4.37	242	447	22	Slightly turbid	Clear	No odour	No sheen	Hydrasleeve
MW102	21/10/2022	14-20	9.696	78.564	68.868	19.91	Good	3.9	131.8	5.03	103.7	308.7	23.8	Slightly turbid	Cloudy, brown sediment	No odour	No sheen	Hydrasleeve
MW103	30/10/2020	7.5 to 10.5	11.63	4.232	33.239	29.007	Good	3.2	157	5.58	157.8	362.8	23.5	Low	Clear	No odour	No sheen	Hydrasleeve
MW103	19/05/2021	7.5 - 10.5	10.85	2.958	33.239	30.281	Good	4.52	94.8	5.77	200.6	405.6	23.4	Clear	Clear	No odour	No sheen	Hydrasleeve
MW103	09/11/2021	7.5 - 10.5	6.167	33.239	27.072	11.6	Good	3.93	119.3	8.01	105.1	310.1	23.8	Low	Clear	No odour	No sheen	Hydrasleeve
MW103	10/05/2022	7.5 - 10.5	2.081	33.239	31.158	11.6	Good	3.77	116	5.25	165	370	22.6	Medium	Clear	No odour	No sheen	Hydrasleeve
MW103	18/10/2022	7.5 - 10.5	2.544	33.239	30.695	11.6	Good	3.95	99	5.55	110.2	315.2	22.7	Low	Clear, fine brown sediment	No odour	No sheen	Hydrasleeve
MW104	30/10/2020	8 to 11	12.045	4.332	20.815	16.483	Good	2.04	154.9	5.04	178	383	24.8	Low	Clear	No odour	No sheen	Hydrasleeve
MW104	19/05/2021	8 - 11	10.84	3.468	20.815	17.347	Good	2.39	112.9	5.68	213	418	24.8	Clear	Clear	No odour	No sheen	Hydrasleeve
MW104	09/11/2021	8 - 11	5.073	20.815	15.742	12.035	Good	2.35	127.8	4.33	107.4	312.4	24.7	Low	Clear	No odour	No sheen	Hydrasleeve
MW104	10/05/2022	8 - 11	3.043	20.815	17.772	12.035	Good	2.2	128	4.71	199	404	22.7	Slightly turbid	Clear	No odour	No sheen	Hydrasleeve
MW104	18/10/2022	8 - 11	3.609	20.815	17.206	12.035	Good	2.72	109.4	5.08	114.8	319.8	23.6	Low	Clear, red/orange sediment	No odour	No sheen	Hydrasleeve
MW105	30/10/2020	4.2 to 7.2	8.33	1.987	27.603	25.616	Good	0.3	611	5.97	121.4	326.4	23.1	Clear	Clear	No odour	No sheen	Hydrasleeve
MW105	20/05/2021	4.2 - 7.2	8.38	1.845	27.603	25.758	Good	1.76	541	6.18	169	374	22.5	Clear	Clear	No odour	No sheen	Hydrasleeve
MW105	09/11/2021	4.2 - 7.2	2.229	27.603	25.374	8.35	Good	0.14	659	9.44	85	290	23.4	Low	Clear	No odour	No sheen	Hydrasleeve
MW105	10/05/2022	4.2 - 7.2	1.748	27.603	25.855	8.35	Good	1.8	572	6.14	98	303	22.6	Medium	Clear	No odour	No sheen	Hydrasleeve
MW105	19/10/2022	4.2 - 7.2	1.546	27.603	26.057	8.35	Good	1.77	621	6.45	59.3	264.3	21.4	Low	Clear, brown sediment	No odour	No sheen	Hydrasleeve
MW106	29/10/2020	4 to 10	11.095	4.101	69.468	65.367	Good	2.5	126.3	4.47	239	444	21.1	Medium	Other	No odour	No sheen	Hydrasleeve
MW106	20/05/2021	4 - 10	10.08	3.707	69.468	65.761	Good	4	81.1	4.26	284	489	21.9	Clear	Clear	No odour	No sheen	Hydrasleeve
MW106	09/11/2021	4 - 10	4.635	69.468	64.833	11.05	Good	2.94	90.7	7.95	146.7	351.7	22.4	Medium	Light brown	No odour	No sheen	Hydrasleeve
MW106	12/05/2022	4 - 10	2.017	69.468	67.451	11.05	Good	3.81	93.4	4.32	168	373	23.1	Medium	Clear	No odour	No sheen	Hydrasleeve
MW106	19/10/2022	4 - 10	2.512	69.468	66.956	11.05	Good	2.94	110.8	5.18	102	307	20.4	Medium-High	Cloudy, brown sediment	No odour	No sheen	Hydrasleeve, rootlets in hydrasleeve
MW107	29/10/2020	2.8 to 5.8	6.8	2.165	37.789	35.624	Good	0.55	215.3	4.82	231.4	436.4	24.7	Clear	Clear	No odour	No sheen	Hydrasleeve
MW107	20/05/2021	2.8 - 5.8	5.66	1.813	37.789	35.976	Good	1.2	195	5.54	161	366	23.2	Clear	Clear	No odour	No sheen	Hydrasleeve
MW107	09/11/2021	2.8 - 5.8	1.833	37.789	35.956	6.31	Good	0.83	214.8	4.87	68.9	273.9	26.8	Low	Clear	No odour	No sheen	Hydrasleeve
MW107	12/05/2022	2.8 - 5.8	1.425	37.789	36.364	6.31	Good	0.87	227	5.37	105	310	22.8	Medium	Clear	No odour	No sheen	Hydrasleeve
MW107	19/10/2022	2.8 - 5.8	2.654	37.789	35.135	6.31	Good	1.55	211.2	5.48	62.2	267.2	-	Low-Medium	Cloudy, red/orange sediment	No odour	No sheen	Hydrasleeve
MW108	29/10/2020	14.5 to 17.5	18.48	5.935	39.99	34.055	Good	0.36	517	6.34	157	362	24.9	Clear	Clear	No odour	No sheen	Hydrasleeve
MW108	20/05/2021	14.5 - 17.5	17.85	4.005	39.99	35.985	Good	0.38	448	6.94	-149	56	22.1	Clear	Clear	No odour	No sheen	Hydrasleeve
MW108	09/11/2021	14.5 - 17.5	5.798	39.99	34.192	18.475	Good	0.62	543	14.3	-15.6	189.4	23.7	Low	Light grey	No odour	No sheen	Hydrasleeve
MW108	12/05/2022	14.5 - 17.5	2.822	39.99	37.168	18.475	Good	0.33	474	6.72	-88.9	116.1	23.5	Medium	Clear, grey sediment	Septic odour	No sheen	Hydrasleeve
MW108	19/10/2022	14.5 - 17.5	5.083	39.99	34.907	18.475	Good	1.24	506	7.1	46.2	251.2	22	Medium-High	Clear, Black/grey sediment	No odour	No sheen	Hydrasleeve
MW109	28/10/2020	7 to 10	11.07	1.829	9.207	7.378	Good	0.34	214.5	5.6	159.3	364.3	22.8	Low	Other	No odour	No sheen	Hydrasleeve
MW109	19/05/2021	7 - 10	9.97	1.075	9.207	8.132	Good	0.55	292.3	7.1	116.5	321.5	21.8	Clear	Light Brown	No odour	No sheen	Hydrasleeve
MW109	08/11/2021	7 - 10	3.091	9.207	6.116	11.06	Good	0.89	180.6	6.73	75.9	280.9	23.6	Low	Clear	No odour	No sheen	Hydrasleeve
MW109	10/05/2022	7 - 10	0.457	9.207	8.750	11.06	Good	0.48	209	5.48	152	357	21.8	Medium	Clear	No odour	No sheen	Hydrasleeve
MW109	18/10/2022	7 - 10	0.778	9.207	8.429	11.06	Good	0.95	250.8	6.02	93.8	298.8	23.6	Low	Clear/Cloudy, Brown Sediment	No odour	No sheen	Hydrasleeve
MW110	28/10/2020	0.5 to 4	4.54	1.043	17.967	16.924	Good	1.37	256.1	5.68	155.2	360.2	22.6	Low	Other	No odour	No sheen	Hydrasleeve
MW110	19/05/2021	0.5 - 4	3.45	1.17	17.967	16.797	Good	1.83	208.3	5.69	238	443	21.7	Clear	Clear	No odour	No sheen	Hydrasleeve
MW110	08/11/2021	0.5 - 4	1.29	17.967	16.677	4.535	Good	1.85	146.7	3.64	172.2	377.2	24.2	Low	Clear	No odour	No sheen	Hydrasleeve
MW110	10/05/2022	0.5 - 4	1	17.967	16.967	4.535	Good	0.97	227	4.5	214	419	22.5	Medium	Clear	No odour	No sheen	Hydrasleeve
MW110	18/10/2022	0.5 - 4	1.251	17.967	16.716	4.535	Good	1.73	155.6	5.41	102.2	307.2	22	Low	Clear, brown sediment	No odour	No sheen	Hydrasleeve
MW111	29/10/2020	16.5 to 20.5	21.52	11.806	78.952	67.146	Good	0.16	256.9	5.41	167.2	372.2	24.3	Clear	Clear	No odour	No sheen	Hydrasleeve
MW111	20/05/2021	16.5 - 20.5	20.8	11.383	78.952	67.569	Good	0.77	229.5	6.23	-102	103	21.4	Clear	Clear	No odour	No sheen	Hydrasleeve
MW111	09/11/2021	16.5 - 20.5	12.093	78.952	66.859	21.535	Good	0.79	235.3	8.08	118.2	323.2	22.5	Low	Clear	No odour	No sheen	Hydrasleeve
MW111	12/05/2022	16.5 - 20.5	9.429	78.952	69.523	21.535	Good	0.32	221	4.95	125.6	330.6	22.9	Medium	Clear	No odour	No sheen	Hydrasleeve

Well ID	Sample Date	Screened Interval depth (mbgs)	Depth to Water (mbtoc)	TOC Elevation (mAHD)	Groundwater Elevation (mAHD)	Well Depth (mbtoc)	Condition of Stand up cover / Gatic	DO (mg/L)	EC (µS/cm)	pH	E_r (mV)	E_h (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method / Comments
MW111	19/10/2022	16.5 - 20.5	9.086	78.952	69.866	21.535	Good	1.55	236.8	5.68	60.7	265.7	21.4	Medium	Cloudy, brown sediment	No odour	No sheen	Hydrasleeve
MW112	29/10/2020	6 to 9	9.86	8.188	65.183	56.995	Good	0.63	155	4.53	230.5	435.5	22.7	Medium	Yellow / Brown	No odour	No sheen	Hydrasleeve
MW112	20/05/2021	6 - 9	8.865	8.504	65.183	56.679	Good	2.02	157	5.51	212	417	21.2	Clear	Clear	No odour	No sheen	Hydrasleeve
MW112	10/11/2021	6 - 9	9.04	65.183	56.143	9.87	Good	0.53	146.2	12.2	142	347	22.7	Turbid	Yellow / brown	No odour	No sheen	Hydrasleeve.
MW112	12/05/2022	6 - 9	6.212	65.183	58.971	9.87	Good	0.29	67	4.87	150	355	22.6	Medium	Clear	No odour	No sheen	Hydrasleeve.
MW112	20/10/202	6 - 9	5.862	65.183	59.321	9.87	Good	1.05	164.8	5.16	130.6	335.6	21.1	Medium	Cloudy	No odour	No sheen	Hydrasleeve
MW113	28/10/2020	6 to 9	9.07	5.496	67.717	62.221	Good	1.32	161.1	4.67	218.4	423.4	22.4	Clear	Clear	No odour	No sheen	Hydrasleeve
MW113	21/05/2021	6 - 9	7.81	4.298	67.717	63.419	Good	1.5	167	5.59	195	400	23.6	Clear	Clear	No odour	No sheen	Hydrasleeve
MW113	10/11/2021	6 - 9	5.389	67.717	62.328	9.015	Good	1.14	131.8	9.33	66	271	23.6	Low	Clear	No odour	No sheen	Hydrasleeve
MW113	12/05/2022	6 - 9	1.051	67.717	66.666	9.015	Good	1.1	162	4.84	164	369	23	Medium	Clear	No odour	No sheen	Hydrasleeve
MW113	20/10/2022	6 - 9	2.013	67.717	65.704	9.015	Good	0.6	153.9	4.9	136.9	341.9	20.8	Low-Medium	Clear, brown sediment	No odour	No sheen	Hydrasleeve
MW114	28/10/2020	8.5 to 11.5	12.505	9.2	73.016	63.816	Good	2.54	93.2	4.66	221	426	22.4	Clear	Clear	No odour	No sheen	Hydrasleeve
MW114	21/05/2021	8.5 - 11.5	11.41	8.156	73.016	64.860	Good	2.34	67.3	4.9	230	435	24.3	Clear	Clear	No odour	No sheen	Hydrasleeve
MW114	10/11/2021	8.5 - 11.5	10.108	73.016	62.908	12.52	Good	1.91	53.9	8.29	76.8	281.8	24	Low	Clear	No odour	No sheen	Hydrasleeve
MW114	12/05/2022	8.5 - 11.5	3.494	73.016	69.522	12.52	Good	1.94	80.3	5.18	158	363	22.8	Medium	Clear	No odour	No sheen	Hydrasleeve
MW114	20/10/2022	8.5 - 11.5	4.235	73.016	68.781	12.52	Good	2.34	72.5	5.49	129.4	334.4	21	Clear	Clear, brown sediment	No odour	No sheen	Hydrasleeve
MW115	29/10/2020	13 to 16	17.045	11.3	76.659	65.359	Good	0.39	188.2	5.07	162.4	367.4	23.9	Low	Clear	No odour	No sheen	Hydrasleeve
MW115	20/05/2021	13 - 16	16.05	10.356	76.659	66.303	Good	0.69	133	4.97	227.2	432.2	22	Clear	Clear	No odour	No sheen	Hydrasleeve
MW115	10/11/2021	13 - 16	12.259	76.659	64.400	17.065	Good	0.89	146.8	9.76	126.6	331.6	23.8	Medium	Yellow / brown	No odour	No sheen	Hydrasleeve
MW115	09/05/2022	13 - 16	9.075	76.659	67.584	17.065	Good	1.19	186.5	5.1	180	385	21.2	Medium	Clear	No odour	No sheen	Hydrasleeve
MW115	17/10/2022	13 - 16	8.597	76.659	68.062	17.065	Good	3.28	252	6.06	85.2	290.2	21.2	Low	Clear, Brown Sediment	No odour	No sheen	Hydrasleeve
MW116	28/10/2020	8 to 11	11.77	6.543	69.815	63.272	Good	0.72	444	6.18	136	341	23.5	Clear	Clear	No odour	No sheen	Hydrasleeve
MW116	19/05/2021	8 - 11	10.74	6.695	69.815	63.120	Good	0.6	394	6.07	138	343	21.9	Clear	Clear	No odour	No sheen	Hydrasleeve
MW116	10/11/2021	8 - 11	7.582	69.815	62.233	11.795	Good	0.63	468	9.53	11.6	216.6	23.1	Medium	Light yellow	No odour	No sheen	Hydrasleeve
MW116	12/05/2022	8 - 11	4.704	69.815	65.111	11.795	Good	0.54	419	5.97	73	278	22.4	Medium	Clear	No odour	No sheen	Hydrasleeve
MW116	19/10/2022	8 - 11	3.976	69.815	65.839	11.795	Good	1.88	545.3	6.45	55	260	20.5	Medium	Cloudy, brown sediment	No odour	No sheen	Hydrasleeve
MW117	28/10/2020	7 to 10	11.02	5.129	68.914	63.785	Good	0.98	450	6.11	129.6	334.6	24.5	Low	Light brown	No odour	No sheen	Hydrasleeve
MW117	18/05/2021	7 - 10	11.02	5.57	68.914	63.344	Good	1.85	379	6.34	20.5	225.5	19.6	Medium	Light Brown	No odour	No sheen	Hydrasleeve
MW117	10/11/2021	7 - 10	6.063	68.914	62.851	11.01	Good	0.83	454.8	9.72	12.7	217.7	22.1	Medium	Yellow / brown	No odour	No sheen	Hydrasleeve
MW117	12/05/2022	7 - 10	3.335	68.914	65.579	11.01	Good	0.22	416	5.31	85	290	22.4	Medium	Clear	No odour	No sheen	Hydrasleeve
MW117	19/10/2022	7 - 10	2.915	68.914	65.999	11.01	Good	1.54	451.3	6.43	51.7	256.7	19.4	Medium	Cloudy, brown sediment	No odour	No sheen	Hydrasleeve
MW118	28/10/2020	10 to 13	13.69	11.165	76.154	64.989	Good	3.71	144.5	4.84	187.3	392.3	22.7	Low	Clear	No odour	No sheen	Hydrasleeve
MW118	21/05/2021	10 - 13	12.35	10.139	76.154	66.015	Good	3.14	94	4.67	252	457	22.1	Clear	Clear	No odour	No sheen	Hydrasleeve
MW118	10/11/2021	10 - 13	12.376	76.154	63.778	13.59	Good	2.56	114.1	8.25	74.4	279.4	23.7	Medium	Pale red	No odour	No sheen	Hydrasleeve
MW118	12/05/2022	10 - 13	6.028	76.154	70.126	13.59	Good	2.37	100	4.54	168	373	22.2	Medium	Clear	No odour	No sheen	Hydrasleeve.
MW118	18/10/2022	10 - 13	7.621	76.154	68.533	13.59	Good	2.67	120.5	4.97	116.3	321.3	21.2	Medium-high	Cloudy/Brownish, red/orange sediment	No odour	No sheen	Hydrasleeve. Rootlets sitting in top of hydrasleeve
MW119	29/10/2020	13 to 16	15.765	8.546	79.546	71.000	Good	2.68	269.5	5.09	167.1	372.1	25.1	Low	Clear	No odour	No sheen	Hydrasleeve
MW119	20/05/2021	13 - 16	14.8	6.625	79.546	72.921	Good	1.78	207	4.63	260	465	23.6	Clear	Clear	No odour	No sheen	Hydrasleeve
MW119	10/11/2021	13 - 16	9.251	79.546	70.295	15.76	Good	2.74	227	9.28	125.1	330.1	24.2	Medium	Other	No odour	No sheen	Hydrasleeve
MW119	09/05/2022	13 - 16	6.216	79.546	73.330	15.76	Good	2.4	227	4.6	211	416	20.9	Medium	Clear	No odour	No sheen	Hydrasleeve
MW119	20/10/2022	13 - 16	6.055	79.546	73.491	15.76	Good	3.63	244.8	5.41	134.3	339.3	22.1	Medium	Cloudy, red sediment	No odour	No sheen	Hydrasleeve
MW120	29/10/2020	Not known	13.735	10.745	71.332	60.587	Good	0.76	177.3	4.37	213.4	418.4	25	Clear	Clear	No odour	No sheen	Hydrasleeve
MW120	20/05/2021	Not known	13.85	10.727	71.332	60.605	Good	0.93	237	4.81	228	433	21	Clear	Clear	No odour	No sheen	Hydrasleeve
MW120	09/11/2021	Not known	11.294	71.332	60.038	14.5	Good	0.82	216.6	6.78	63.2	268.2	22.9	Clear	Clear	No odour	No sheen	Hydrasleeve
MW120	10/05/2022	Unknown	9.035	71.332	62.297	14.5	Good	0.38	122	4.72	212.7	417.7	21.6	Clear	Clear	No odour	No sheen	Hydrasleeve
MW120	20/10/2022	Unknown	8.867	71.332	62.465	14.5	Good	1.301	132.1	5.01	112.3	317.3	22.1	Med	Cloudy, brown sediment	No odour	No sheen	Hydrasleeve
MW121	29/10/2020	Not known	15.07	9.972	70.405	60.433	Good	1.05	140.5	4.69	199.3	404.3	23.4	Clear	Clear	No odour	No sheen	Hydrasleeve
MW121	20/05/2021	Not known	15.2	9.72	70.405	60.685	Good	1.05	193	6.1	166	371	20.6	Clear	Clear	No odour	No sheen	Hydrasleeve
MW121	09/11/2021	Not known	10.762	70.405	59.643	14.4	Good	1.23	111.9	10.8	106.2	311.2	23.3	Clear	Clear	No odour	No sheen	Hydrasleeve
MW121	11/05/2022	Unknown	7.489	70.405	62.916	14.4	Good	0.8	181	4.53	156	361	22	Clear	Clear	No odour	No sheen	Hydrasleeve
MW121	20/10/2022	Unknown	7.306	70.405	63.099	14.4	Good	0.94	234.2	4.87	137.5	342.5	21.5	Clear	Low, brown sediment	No odour	No sheen	Hydrasleeve
MW122	29/10/2020	Not known	20.1	9.373	70.575	61.202	Good	0.69	105.6	4.38	189.6	394.6	24.5	Medium	Other	No odour	No sheen	Hydrasleeve
MW122	20/05/2021	Not known	20.04	8.91	70.575	61.665	Good	0.85	69.4	4.84	230	435	21.5	Clear	Clear	No odour	No sheen	Hydrasleeve
MW122	09/11/2021	Not known	10.351	70.575	60.224	19.4	Good	0.96	74.9	8.17	73.9	278.9	24.2	Clear	Clear	No odour	No sheen	Hydrasleeve
MW122	10/05/2022	Unknown	5.005	70.575	65.570	19.4	Good	1.6	115	4.39	272	477	22	Clear	Clear	No odour	No sheen	Hydrasleeve
MW122	20/10/2022	Unknown	5.136	70.575	65.439	19.4	Good	1	98.6	4.84	136.6	341.6	22.1	Clear	Clear, brown sediment	No odour	No sheen	Hydrasleeve
POT001	28/10/2020	18 to 78.4	-	-	-	-	-	2.03	593	6.39	117.2	322.2	24.2	Clear	Clear	No odour	No sheen	Tap
POT001	20/05/2021	18 - 78.4	-	-	-	-	-	1.16	498	6.55	77	282	22.9	Clear	Clear	No odour	No sheen	Tap
POT001	10/11/2021	18 - 78.4	-	-	-	-	-	3.77	576	8.76	71.6	276.6	26.1	Clear	Clear	No odour	No sheen	Tap
POT001	09/05/2022	18 - 78.4	-	-	-	-	-	2.8	453	6.8	148	353	19.5	Clear	Clear	No odour	No sheen	Tap
POT001	20/10/2022	18 - 78.4	-	-	-	-	-	3.01	517	6.7	135	340	21.4	Clear	Clear	No odour	No sheen	Tap
POT005	28/10/2020	30 to 51.5	-	-	-	-	-	1.79	481.3	6.67	79.1	284.1	24.1	Clear	Clear	No odour	No sheen	Tap
POT005	20/05/2021	30 - 51.5	-	-	-	-	-	3.05	440	6.72	87	292	22.1	Clear	Clear	No odour	No sheen	Tap
POT005	10/11/2021	30 - 51.5	-	-	-	-	-	0.53	545	6.22	-3.4	201.6	27	Clear	Clear	No odour	No sheen	Tap
POT005	09/05/2022	30 - 51.5	-	-	-	-	-	2.5	484	6.7	151	356	21	Clear	Clear	No odour	No sheen	Tap
POT005	20/10/2022	30 - 51.5	-	-	-	-	-	1.76	480.5	6.9	119.3	324.3	22	Clear	Clear	No odour	No sheen	Tap

Notes
mbgs is metres below ground surface
mbtoc is metres below top of casing
mAHD is metres above Australian height datum
DO is dissolved oxygen
EC is electrical conductivity
E_h is oxidation reduction potential
Oxidation reducation potential (E_r) measured with a platinum electrode and a silver/silver chloride reference electrode (E_r) and converted to E_h by $E_h = E_r + 205$ mV (based on a groundwater temperature of 21°C)
Temp is Temperature
µS/cm is microsiemens per centrimetre
ºC is degrees Celcius
mV is millivolts
` - No data

		Sum of PFHxS and PFOS	Perfluoroalkyl Sulfonic Acids						Perfluoroalkyl Carbonic Acids											Perfluoroalkyl Sulfonamides							Fluorotelomer Sulfonic Acids				Sum of PFAS
			PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FtS	8:2 FTS	10:2 FTS	
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.005	0.002
NEMP (HEPA, 2020) Human Health Drinking Water		0.07											0.56																	
NHMRC (HEPA, 2020) Human Health Recreational Water		**2.0**											**10**																	
NEMP (HEPA, 2020) Ecological Freshwater 99% Species Protection							0.00023						19																	

Location	Alt ID	Sample	Date	Lab Report	Type																												
MW101	MW101	0224_MW101_180924	24/09/2018	EB1823571	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW101	MW101	0224_MW101_190604	4/06/2019	EB1914500	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW101	MW101	0224_MW101_201029	29/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW101	MW101	0224_MW101_210521	21/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW101	MW101	0224_MW101_211111	11/11/2021	EB2132641	Normal	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.4	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.22	<0.09	<0.22	<0.22	<0.22	<0.22	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09	<0.09
MW101	MW101	0224_MW101_220510	10/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW101	MW101	0224_MW101_221022	22/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW102	MW102	0224_MW102_180924	24/09/2018	EB1823571	Normal	0.019	<0.002	<0.002	0.007	<0.002	0.012	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.019
MW102	MW102	0224_QC115_190529	28/05/2019	EB1913917	Field_D	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW102	MW102	0224-QC215-190529	29/05/2019	RN1235762	Interlab_D	<0.002	<0.001	<0.001	<0.01	<0.001	<0.002	<0.001	0.0053	0.005	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.001	<0.002	<0.002	<0.005	<0.005	<0.002	<0.002	<0.001	<0.01	<0.001	<0.001	<0.002
MW102	MW102	0224_MW102_190529	29/05/2019	EB1913917	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW102	MW102	0224_MW102_211110	11/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW102	MW102	0224_MW102_220510	10/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW102	MW102	0224_MW102_221021	21/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW103	MW103	0224_MW103_180925	25/09/2018	EB1823571	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW103	MW103	0224_MW103_190530	30/05/2019	EB1913917	Normal	0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.002
MW103	MW103	0224_MW103_201030	30/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW103	MW103	0224_MW103_210519	19/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW103	MW103	0224_MW103_211109	9/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW103	MW103	0224_MW103_220510	10/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW103	MW103	0224_MW103_221018	18/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW104	MW104	0224_MW104_180925	25/09/2018	EB1823571	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW104	MW104	0224_MW104_190530	30/05/2019	EB1913917	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW104	MW104	0224_MW104_201030	30/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW104	MW104	0224_MW104_210519	19/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW104	MW104	0224_MW104_211109	9/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW104	MW104	0224_MW104_220510	10/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW104	MW104	0224_MW104_221018	18/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW105	MW105	0224_MW105_180925	25/09/2018	EB1823571	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW105	MW105	0224_MW105_190530	30/05/2019	EB1913917	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW105	MW105	0224_MW105_201030	30/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW105	MW105	0224_MW105_210520	20/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW105	MW105	0224_MW105_211110	10/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW105	MW105	0224_MW105_220510	10/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW105	MW105	0224_MW105_221019	19/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW106	MW106	0224_MW106_180926	26/09/2018	EB1823571	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW106	MW106	0224_MW106_190528	28/05/2019	EB1913917	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW106	MW106	0224_MW106_201029	29/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW106	MW106	0224_MW106_210520	20/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW106	MW106	0224_MW106_211109	9/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW106	MW106	0224_MW106_220512	12/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW106	MW106	0224_MW106_221019	19/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW107	MW107	0224_MW107_180926	26/09/2018	EB1823571	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW107	MW107	0224_MW107_190527	27/05/2019	EB1913917	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW107	MW107	0224_MW107_201029	29/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW107	MW107	0224_MW107_210520	20/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW107	MW107	0224_MW107_211109	9/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW107	MW107	0224_MW107_220512	12/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW107	MW107	0224_MW107_221019	19/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW108	MW108	0224_MW108_180926	26/09/2018	EB1823571	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW108	MW108	0224_MW108_190527	27/05/2019	EB1913917	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW108	MW108	0224_MW108_201029	29/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW108	MW108	0224_MW108_210520	20/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW108	MW108	0224_MW108_211109	9/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW108	MW108	0224_MW108_220512	12/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW108	MW108	0224_MW108_221019	19/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW109	MW109	0224_MW109_180925	25/09/2018	EB1823571	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW109	MW109	0224_MW109_190604	4/06/2019	EB1914500	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW109	MW109	0224_MW109_201028	28/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW109	MW109	0224_MW109_210519	19/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW109	MW109	0224_MW109_211108	8/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW109	MW109	0224_MW109_220510	10/05/2022	EB2213545	Normal	0.02	<0.02	<0.02	<0.01	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.02
MW109	MW109	0224_MW109_221018	18/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW110	MW110	0224_QC208_180925	25/09/2018	RN1210825	Interlab_D	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW110	MW110	0224_QC108_180925	25/09/2018	EB1823571	Field_D	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW110	MW110	0224_MW110_180925	25/09/2018	EB1823571	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW110	MW110	0224_MW110_190604	4/06/2019	EB1914500	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01

			Perfluoroalkyl Sulfonic Acids						Perfluoroalkyl Carbonic Acids											Perfluoroalkyl Sulfonamides							Fluorotelomer Sulfonic Acids				
	Unit	Sum of PFHxS and PFOS	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FtS	8:2 FTS	10:2 FTS	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
LOR	µg/L	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.005	0.002
NEMP (HEPA, 2020) Human Health Drinking Water		0.07											0.56																		
NHMRC (HEPA, 2020) Human Health Recreational Water		**2.0**											**10**																		
NEMP (HEPA, 2020) Ecological Freshwater 99% Species Protection							0.00023						19																		

Location	Alt ID	Sample	Date	Lab Report	Type																												
MW111	MW111	0224_MW111_221019	19/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW112	MW112	0224_MW112_190909	9/09/2019	EB1924154	Normal	0.004	<0.002	<0.002	<0.002	<0.002	0.004	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.004
MW112	MW112	0224_MW112_201029	29/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW112	MW112	0224_MW112_210520	20/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW112	MW112	0224_MW112_211110	10/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW112	MW112	0224_MW112_220512	12/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW112	MW112	0224_MW112_221020	20/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW113	MW113	0224_MW113_190909	9/09/2019	EB1924154	Normal	0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.002
MW113	MW113	0224_MW113_201028	28/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW113	MW113	0224_MW113_210521	21/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW113	MW113	0224_MW113_211110	10/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW113	MW113	0224_MW113_220512	12/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW113	MW113	0224_MW113_221020	20/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW114	MW114	0224_MW114_190911	11/09/2019	EB1924154	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW114	MW114	0224_MW114_201028	28/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW114	MW114	0224_MW114_210521	21/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW114	MW114	0224_MW114_211110	10/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW114	MW114	0224_MW114_220512	12/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW114	MW114	0224_MW114_221020	20/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW115	MW115	0224_MW115_190910	10/09/2019	EB1924154	Normal	0.01	<0.002	<0.002	0.005	<0.002	0.005	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.01
MW115	MW115	0224_MW115_201029	29/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW115	MW115	0224_MW115_210520	20/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW115	MW115	0224_MW115_211110	10/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW115	MW115	0224_MW115_220509	9/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW115	MW115	0224_MW115_221017	17/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW116	MW116	0224_MW116_190910	10/09/2019	EB1924154	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW116	MW116	0224_MW116_201028	28/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW116	MW116	0224_MW116_210519	19/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW116	MW116	0224_MW116_211110	10/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW116	MW116	0224_MW116_220512	12/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW116	MW116	0224_MW116_221019	19/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW117	MW117	0224_MW117_190910	10/09/2019	EB1924154	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW117	MW117	0224_MW117_201028	28/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW117	MW117	0224_MW117_210518	18/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW117	MW117	0224_MW117_211110	10/11/2021	EB2132641	Normal	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.06	<0.02	<0.06	<0.06	<0.06	<0.06	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02
MW117	MW117	0224_MW117_220512	12/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW117	MW117	0224_MW117_221019	19/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW118	MW118	0224_MW118_190910	10/09/2019	EB1924154	Normal	0.021	<0.002	<0.002	0.012	<0.002	0.009	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.021
MW118	MW118	0224_MW118_201028	28/10/2020	EB2028561	Normal	0.01	<0.02	<0.02	<0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.01
MW118	MW118	0224_MW118_210521	21/05/2021	EB2114447	Normal	0.03	<0.02	<0.02	0.02	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.03
MW118	MW118	0224_MW118_211110	10/11/2021	EB2132641	Normal	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.06	<0.02	<0.06	<0.06	<0.06	<0.06	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02
MW118	MW118	0224_MW118_211110	10/11/2021	EB2132641	Field_D	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.06	<0.02	<0.06	<0.06	<0.06	<0.06	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02
MW118	MW118	0224_MW118_211110	10/11/2021	RN1335135	Interlab_D	0.019	<0.01	<0.01	0.019	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.019
MW118	MW118	0224_QC229_220512	12/05/2022	AECO06_220517	Interlab_D	0.038	<0.01	<0.01	0.038	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.038
MW118	MW118	0224_MW118_220512	12/05/2022	EB2213545	Normal	0.09	<0.02	<0.02	0.06	<0.02	0.03	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.09
MW118	MW118	0224_QC129_220512	12/05/2022	EB2213545	Field_D	0.07	<0.02	<0.02	0.05	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.07
MW118	MW118	0224_MW118_221018	18/10/2022	EB221148	Normal	0.02	<0.02	<0.02	0.01	<0.02	0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.02
MW118	MW118	0224_QC131_221018	18/10/2022	EB221148	Field_D	0.04	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.04
MW118	MW118	0224_QC231_221018	18/10/2022	AECO06_221026	Interlab_D	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW119	MW119	0224_QC223_190909	9/09/2019	RN1247904	Interlab_D	0.0116	<0.001	<0.001	0.0021	<0.001	0.0095	<0.001	<0.005	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.001	<0.002	<0.002	<0.005	<0.005	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	0.0116
MW119	MW119	0224_MW119_190909	9/09/2019	EB1924154	Normal	0.011	<0.002	<0.002	<0.002	<0.002	0.011	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.011
MW119	MW119	0224_QC123_190909	9/09/2019	EB1924154	Field_D	0.012	<0.002	<0.002	<0.002	<0.002	0.012	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.012
MW119	MW119	0224_MW119_201029	29/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW119	MW119	0224_MW119_210520	20/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW119	MW119	0224_MW119_211110	10/11/2021	EB2132641	Normal	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.06	<0.02	<0.06	<0.06	<0.06	<0.06	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02
MW119	MW119	0224_MW119_220509	9/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW119	MW119	0224_MW119_221020	20/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW120	MB1.1	0224_MB01.1_170814	14/08/2017	EB1716701	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	-	-	-	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01
MW120	MB1.1	0224_MB01.1_180926	26/09/2018	EB1823571	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	-	-	<0.002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.002
MW120	MB1.1	0224_MB01.1_190528	28/05/2019	EB1913917	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
MW120	MB1.1	0224_MW120_201029	29/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	*<0.01*	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW120	MB1.1	0224_MW120_210521	21/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW120	MB1.1	0224_MW120_210521	11/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW120	MB1.1	0224_MW120_220510	10/05/2022	EB2213545	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW120	MB1.1	0224_MW120_221020	20/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW121	MB2.1	0224_MB02.1_170307	7/03/2017	EB1704612	Normal	0.26	<0.02	<0.02	0.18	<0.02	<0.01	-	-	-	<0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.26
MW121	MB2.1	0224_MB02.1_170814	14/08/2017	EB1716701	Normal	0.14	<0.02	<0.02	0.08	<0.02	0.06	-	-	-	<0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.14
MW121	MB2.1	0224_MB02.1_180926	26/09/2018	EB1823571	Normal	0.152	0.013	0.013	0.107	0.006	0.045	-	-	-	0.004	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.188
MW121	MB2.1	0224_MB02.1_

			Perfluoroalkyl Sulfonic Acids						Perfluoroalkyl Carbonic Acids											Perfluoroalkyl Sulfonamides							Fluorotelomer Sulfonic Acids				
		Sum of PFHxS and PFOS	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FtS	8:2 FTS	10:2 FTS	Sum of PFAS
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.005	0.002
NEMP (HEPA, 2020) Human Health Drinking Water		0.07											0.56																	
NHMRC (HEPA, 2020) Human Health Recreational Water		**2.0**											**10**																	
NEMP (HEPA, 2020) Ecological Freshwater 99% Species Protection							0.00023						19																	
POT001	WS01	6/07/2017	EB1713783	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
POT001	WS01	0224_WS01_180927	27/09/2018	EB1823571	Normal	0.043	0.004	0.004	0.037	<0.002	0.006	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.051
POT001	WS01	0224_WS01_190529	29/05/2019	EB1913917	Normal	0.022	0.002	<0.002	0.022	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.024
POT001	WS01	0224_POT001_201028	28/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
POT001	WS01	0224_POT001_210520	20/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
POT001	WS01	0224_POT001_211110	10/11/2021	EB2132641	Normal	0.02	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.02
POT001	WS01	0224_POT001_220509	9/05/2022	EB2213545	Normal	0.03	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.03
POT001	WS01	0224_POT001_221020	20/10/2022	EB221148	Normal	0.03	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.03
POT002	WS02	WS01	6/07/2017	EB1713783	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
POT002	WS02	0224_WS02_180927	27/09/2018	EB1823571	Normal	0.02	<0.002	0.002	0.018	<0.002	0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.022
POT002	WS02	0224_WS02_190529	29/05/2019	EB1913917	Normal	0.01	<0.002	<0.002	0.01	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.01
POT002	WS02	0224_WS02_190529	29/05/2019	EB1913917	Normal	0.01	<0.002	<0.002	0.01	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.01
POT003	WS03	WS01	6/07/2017	EB1713783	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
POT003	WS03	0224_WS03_190605	27/09/2018	EB1823571	Normal	0.014	<0.002	<0.002	0.014	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.014
POT003	WS03	0224_QC116_190605	5/06/2019	EB1914500	Field_D	0.008	<0.002	<0.002	0.008	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.008
POT003	WS03	0224_WS03_190605	5/06/2019	EB1914500	Normal	0.008	<0.002	<0.002	0.008	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.008
POT003	WS03	0224_QC216_190605	5/06/2019	RN1235906	Interlab_D	0.0087	<0.001	<0.001	0.0087	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.002	<0.002	<0.005	<0.005	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	0.0087
POT004	WS04	WS01	6/07/2017	EB1713783	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
POT004	WS04	0224_WS03_190605	27/09/2018	EB1823571	Normal	0.013	<0.002	<0.002	0.013	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.013
POT004	WS04	0224_WS04_190529	29/05/2019	EB1913917	Normal	0.01	<0.002	<0.002	0.01	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.010
POT005	WS05	0224_WS04_190529	27/09/2018	EB1823571	Normal	0.01	<0.002	<0.002	0.01	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.013
POT005	WS05	0224_WS05_190529	29/05/2019	EB1913917	Normal	0.007	<0.002	<0.002	0.007	<0.002	<0.002	<0.002	<0.01	<0.002	0.009	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	0.01	<0.005	<0.005	0.026
POT005	WS05	0224_POT005_201028	28/10/2020	EB2028561	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
POT005	WS05	0224_POT005_210520	20/05/2021	EB2114447	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
POT005	WS05	0224_POT005_2101110	10/11/2021	EB2132641	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
POT005	WS05	0224_POT005_220509	9/05/2022	EB2213545	Normal	0.02	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.02
POT005	WS05	0224_POT005_221020	22/10/2022	EB221148	Normal	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
POT006	RN156623	0224_RN156623_190529	29/05/2019	EB1913917	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
POT101	GW01	0224_GW01_190815	15/08/2019	EB1921486	Normal	<0.002	0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.006
POT102	GW02	0224_GW02_190815	15/08/2019	EB1921486	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
POT103	GW03	0224_GW03_190815	15/08/2019	EB1921486	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
POT104	GW04	0224_GW04_190913	13/09/2019	EB1924153	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
POT105	GW05	0224_GW05_190913	13/09/2019	EB1924164	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
POT106	GW06	0224_GW06_190913	13/09/2019	EB1924163	Normal	0.004	<0.002	<0.002	<0.002	<0.002	0.004	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.004
POT107	GW07	0224_GW07_190913	13/09/2019	EB1924162	Normal	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	-	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
POT108	GW08	0224_QC225_191024	24/10/2019	RN1251547	Interlab_D	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.005	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.002	<0.002	<0.005	<0.005	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002
POT108	GW08	0224_QC125_191024	24/10/2019	EB1928343	Field_D	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0003	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	-	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0003
POT108	GW08	0224_GW08_191024	24/10/2019	EB1928343	Normal	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0003	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	-	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0003

LOR is limit of reporting
µg/L is micrograms per litre
'-' denotes no analysis undertaken
'<' denotes concentration is less than

Location ID	Sample Date	DO (mg/L)	EC (µS/cm)	pH	E_r (mV)	E_h (mV)	Temp (°C)	Turbidity	Odour	Sheen
SW004	27/10/2020	4.75	253.9	7.51	79.4	284.4	25.1	Clear	No odour	No sheen
SW004	19/05/2021	7.01	155.5	5.35	201	406	17.9	Clear	No odour	No sheen
SW004	10/11/2021	6.13	103.4	4.73	70.9	275.9	23.8	Medium	No odour	No sheen
SW004	11/05/2022	5.07	136	5.08	168	373	21.4	Clear	No odour	No sheen
SW004	18/10/2022	3.99	172.8	6.07	108.8	313.8	22.7	Clear	No odour	No sheen
SW005	27/10/2020	3.13	232.4	6.17	74.9	279.9	24.6	Clear	No odour	Slight organic sheen
SW005	19/05/2021	5.68	132.7	5.85	108.5	313.5	18.8	Clear	No odour	No sheen
SW005	11/11/2021	5.65	134	4.67	92.3	297.3	23.5	Low	No odour	No sheen
SW005	11/05/2022	4.39	114	4.98	162	367	21.5	Slightly turbid	No odour	No sheen
SW005	18/10/2022	3.82	135	6.08	105.6	310.6	21.7	Slightly turbid, clear/brown	No odour	No sheen
SW006	27/10/2020	4.56	202.8	6.33	120.4	325.4	24.9	Clear	No odour	Slight organic sheen
SW006	20/05/2021	3.07	86.7	5.89	140	345	17.1	Clear	No odour	No sheen
SW006	9/11/2021	2.83	184.8	8.79	111.2	316.2	23.7	Low	No odour	No sheen
SW006	12/05/2022	3.16	87	5.29	144	349	22.3	Slightly turbid	No odour	No sheen
SW006	19/10/2022	4.2	144.6	6.78	86.3	291.3	21.8	Slightly turbid	No odour	No sheen
SW007	26/10/2020	4.2	195.7	5.95	131.9	336.9	25.5	Clear	No odour	No sheen
SW007	20/05/2021	9.28	99.5	4.27	277	482	16.5	Clear	No odour	No sheen
SW007	8/11/2021	3.23	160.1	4.62	104.5	309.5	25.9	Low	No odour	No sheen
SW007	10/05/2022	3.78	106	4.71	196	401	21.4	Medium	No odour	No sheen
SW007	18/10/2022	2.8	132	5.5	111.4	316.4	25	Low, clear	No odour	No sheen
SW008	27/10/2020	3.08	41392	6.82	84.2	289.2	26.2	Clear	No odour	No sheen
SW008	19/05/2021	5.61	2959	6.31	149.7	354.7	19.5	Clear	No odour	No sheen
SW008	11/05/2022	4.57	166	5.06	143	348	21.4	Clear	No odour	No sheen
SW008	17/10/2022	4.25	25221	6.66	101.6	306.6	25.6	Clear	No odour	No sheen
SW009	26/10/2020	0.26	225.9	5.51	51	256	21.5	Clear	No odour	Slight organic sheen
SW009	19/05/2021	4.11	232	6.93	166.7	371.7	17.5	Clear	No odour	No sheen
SW009	8/11/2021	1.47	213.9	5.03	100.4	305.4	22.4	Low	No odour	No sheen
SW009	11/05/2022	5.15	88.3	5.27	148	353	23.1	Turbid	No odour	No sheen
SW009	19/10/2022	4.72	213.7	6.36	55.9	260.9	21.9	Low-medium	No odour	No sheen
SW012	26/10/2020	5.31	46198	7.18	49.1	254.1	27.7	Clear	No odour	No sheen
SW012	19/05/2021	5.16	9667	6.91	122	327	19.3	Medium	No odour	No sheen
SW012	11/05/2022	4.63	398	5.34	136	341	21.2	Clear	No odour	No sheen
SW012	17/10/2022	3.9	39340	7.25	57.5	262.5	24.9	Low, clear/brown	No odour	No sheen
SW013	26/10/2020	6.02	41260	7.29	41.1	246.1	23.6	Clear	No odour	No sheen
SW013	19/05/2021	5.77	9461	6.17	130.8	335.8	21.1	Clear	No odour	No sheen
SW013	10/05/2022	5.78	109	4.8	203	408	21.6	Medium	No odour	No sheen
SW013	18/10/2022	4.62	24179	6.71	108.1	313.1	27.4	Low-medium, clear/brown	No odour	No sheen
SW014	26/10/2020	4.87	220.1	7.83	52	257	22.3	Low	No odour	No sheen
SW014	19/05/2021	5.7	121.4	6.8	151.2	356.2	17.8	Clear	No odour	No sheen
SW014	8/11/2021	2.58	463.6	8.88	49.7	254.7	24.7	Clear	No odour	No sheen
SW014	10/05/2022	3.90	123	4.9	194	399	21	Clear	No odour	No sheen
SW014	18/10/2022	3.56	545	6.7	95.2	300.2	25.6	Clear/brown	No odour	No sheen
SW016	26/10/2020	4.48	174.3	7.7	93.4	298.4	23.1	Clear	No odour	No sheen
SW016	19/05/2021	8.1	87	5.16	240	445	17.3	Clear	No odour	No sheen
SW016	9/11/2021	6.84	140.8	4.9	109.3	314.3	22.5	Low	No odour	No sheen
SW016	12/05/2022	4.80	67.7	5.18	144	349	21.7	Medium	No odour	No sheen
SW016	20/10/2022	5.52	167.7	4.91	152.6	357.6	21	Clear/brown, low turbidity	No odour	No sheen
SW017	27/10/2020	5.91	169.9	7.16	97.9	302.9	23.2	Clear	No odour	No sheen
SW017	21/05/2021	3.42	932	6.85	146	351	19.2	Clear	No odour	No sheen
SW017	9/11/2021	4.89	53.9	8.64	133.7	338.7	23.2	Medium	No odour	No sheen
SW017	9/05/2022	6.80	107	6.27	165	370	20.9	Slightly turbid	No odour	No sheen
SW017	21/10/2022	6.5	39	6.55	92.3	297.3	22	Low	No odour	No sheen
SW018	27/10/2020	5.79	117.9	7.23	101	306	24	Clear	No odour	No sheen
SW018	20/05/2021	6.34	434	6.9	149	354	22.0	Turbid	No odour	No sheen
SW018	9/11/2021	5.52	15.1	7.42	157.8	362.8	22.7	Turbid	No odour	No sheen
SW018	9/05/2022	6.00	78	6.1	163	368	21.3	Clear	No odour	No sheen
SW018	21/10/2022	6.07	34	6.31	94.5	299.5	22.3	Clear	No odour	No sheen
SW019	28/10/2020	4.03	206.7	5.9	179.6	384.6	24.5	Low	No odour	No sheen
SW019	20/05/2021	9.56	189	6.09	139	344	20.0	Clear	No odour	No sheen
SW019	9/11/2021	5.73	25.9	7.58	180.8	385.8	22.7	Medium	No odour	No sheen
SW019	9/05/2022	5.81	143	5.35	173	378	20.5	Grey, silty	No odour	No sheen
SW019	20/10/2022	3.5	194.1	6.64	53.7	258.7	19.6	High, brown sediment	No odour	No sheen
SW020	29/10/2020	4.31	117.9	4.9	215.2	420.2	25.1	Clear	No odour	No sheen
SW020	18/05/2021	Not sampled- stakeholder could not be contacted to obtain access permission.								
SW020	21/05/2021	Not sampled- stakeholder could not be contacted to obtain access permission.								
SW021	13/10/2020	4.6	182	-	155	360	20.4	-	No odour	No sheen
SW021	18/05/2021	0.96	115	5.9	16.9	221.9	16.9	Clear	Slight organic odour	No sheen
SW021	11/11/2021	1.25	157.4	3.75	23.8	228.8	25.3	Low	No odour	No sheen
SW021	13/05/2022	2.50	107	5.13	119	324	21.7	Clear	No odour	No sheen
SW021	19/10/2022	3.61	187.8	6.55	50.6	255.6	20.5	low-medium, brown/clear	No odour	No sheen
SW022	13/10/2020	4.77	135	-	243	448	26.1	-	No odour	No sheen
SW022	18/05/2021	2.81	92	7.12	112	317	17.9	Turbid	No odour	No sheen
SW022	11/11/2021	2.18	68.5	4.41	105.3	310.3	25.8	Medium	No odour	No sheen
SW022	12/05/2022	3.86	72	5.24	163	368	23.5	Clear	No odour	No sheen
SW022	19/10/2022	1.4	119.5	5.09	62.2	267.2	20.5	Medium, brown	No odour	No sheen
SW023	13/10/2020	6.27	125	-	247	452	26.2	-	No odour	No sheen
SW023	18/05/2021	5.05	69	6.81	70	275	19.2	Turbid	No odour	No sheen
SW023	11/11/2021	5.33	81.5	5.45	64.1	269.1	27.7	Medium	No odour	No sheen
SW023	12/05/2022	2.72	106	5.72	103	308	23.6	Clear	No odour	No sheen
SW023	19/10/2022	1.05	105.5	6.19	61.4	266.4	20.3	Medium, brown	No odour	No sheen
SW024	29/10/2020	1.91	174.4	5.39	167.1	372.1	22.8	Clear	No odour	No sheen
SW024	19/05/2021	1.1	126	5.5	184	389	19.2	Clear	No odour	No sheen
SW024	11/11/2021	5.48	170.2	5.12	52.9	257.9	26.8	Turbid	No odour	No sheen
SW024	9/05/2022	Not sampled- stakeholder declined access.								
SW024	17/10/2022	Not sampled- stakeholder declined access.								
SW025	28/10/2020	3.85	187.1	5.62	158.4	363.4	23.5	Clear	No odour	No sheen
SW025	19/05/2021	1.74	118	5.62	195	400	17.9	Clear	Organic odour	No sheen
SW025	9/11/2021	4.42	128.9	5.83	150.1	355.1	23.5	Medium	No odour	No sheen
SW025	12/05/2022	3.09	94	5.29	134	339	21.6	Brown	No odour	No sheen
SW025	19/10/2022	2.74	151.8	6.4	48.7	253.7	20.2	Low, clearish/brown	No odour	No sheen
SW026	28/10/2020	1.82	224.2	6.45	150.3	355.3	22	Turbid	No odour	No sheen
SW027	18/05/2021	3.46	173	5.97	100	305	16.8	Turbid	No odour	No sheen
SW027	9/11/2021	3.53	93.7	9.63	110.7	315.7	22.8	Turbid	No odour	No sheen
SW027	11/05/2022	3.23	107	5.97	116	321	21	Turbid	No odour	No sheen
SW027	19/10/2022	1	145.6	6.45	74.4	279.4	18.4	Turbid, brown	No odour	No sheen

Notes
DO is dissolved oxygen
EC is electrical conductivity
E_h is oxidation reduction potential
Oxidation reducation potential (E_r) measured with a platinum electrode and a silver/silver chloride reference electrode (E_r) and converted to E_h by $E_h = E_r + 205$ mV (based on a
Temp is Temperature
µS/cm is microsiemens per centrimetre
ºC is degrees Celcius
mV is millivolts
` - No data

			Perfluoroalkyl Sulfonic Acids						Perfluoroalkyl Carbonic Acids											Perfluoroalkyl Sulfonamides							Fluorotelomer Sulfonic Acids				
		Sum of PFHxS and PFOS	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FtS	8:2 FTS	10:2 FTS	Sum of PFAS
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	0.0003	0.0005	0.0005	0.0005	0.0005	0.0003	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.001	0.001	0.001	0.0005	0.0005	0.001	0.001	0.001	0.001	0.0003
NHMRC (2019) Recreational Contact with Waters		2.0											10																	
NEMP (HEPA, 2018) Ecological Freshwater 99% Species Protection							0.00023						19																	

ID	Setting	Location	Date																													
SW001	Freshwater	Kauri Creek	8/03/2017	<0.01	-	-	<0.01	-	<0.01	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01
SW002	Freshwater	Mosquito Creek	16/08/2017	<0.01	-	-	<0.01	-	<0.01	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01
SW003	Estuarine	Mosquito Creek	8/03/2017	<0.05	-	-	<0.05	-	<0.05	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05
SW004	Freshwater	Kauri Creek	15/08/2017	<0.01	-	-	<0.01	-	<0.01	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01
SW004	Freshwater	Kauri Creek	27/09/2018	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.002
SW004	Freshwater	Kauri Creek	29/05/2019	<0.0003	<0.0005	-	<0.0005	-	<0.0003	-	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.0003
SW004	Freshwater	Kauri Creek	27/10/2020	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.008	<0.002	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.0016
SW004	Freshwater	Kauri Creek	19/05/2021	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.003	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0045	<0.0016	<0.004	<0.005	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.0016
SW004	Freshwater	Kauri Creek	11/11/2021	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.004	<0.202	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0019	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.0008
SW004	Freshwater	Kauri Creek	11/05/2022	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0157	<0.0157	<0.0393	<0.0016	<0.039	<0.039	<0.039	<0.039	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.0157
SW004	Freshwater	Kauri Creek	18/10/2022	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.002
SW005	Freshwater	Mosquito Creek	8/03/2017	<0.01	-	-	<0.01	-	<0.01	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01
SW005	Freshwater	Mosquito Creek	29/05/2019	<0.0003	<0.0005	-	<0.0005	-	<0.0003	-	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.0003
SW005	Freshwater	Mosquito Creek	27/10/2020	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.008	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016
SW005	Freshwater	Mosquito Creek	19/05/2021	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.002	0.0051	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0051
SW005	Freshwater	Mosquito Creek	11/11/2021	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.004	<0.012	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.0008
SW005	Freshwater	Mosquito Creek	11/05/2022	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0081	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0162	<0.0162	<0.0404	<0.0016	<0.04	<0.04	<0.04	<0.04	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0162
SW005	Freshwater	Mosquito Creek	18/10/2022	<0.002	<0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW006	Freshwater	Tributary of Kangaroo Creek	8/03/2017	4.62	-	-	0.69	-	3.93	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.14
SW006	Freshwater	Tributary of Kangaroo Creek	26/07/2018	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW006	Freshwater	Tributary of Kangaroo Creek	27/05/2019	0.0013	<0.0005	-	0.0008	-	0.0005	-	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	0.0013
SW006	Freshwater	Tributary of Kangaroo Creek	27/10/2020	0.0017	<0.0016	<0.0016	0.0017	<0.0016	<0.0016	<0.0016	<0.008	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0017
SW006	Freshwater	Tributary of Kangaroo Creek	20/05/2021	0.0016	<0.0016	<0.0016	0.0016	<0.0016	<0.0016	<0.0016	<0.008	<0.0035	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0016
SW006	Freshwater	Tributary of Kangaroo Creek	9/11/2021	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.008	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0008	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0016
SW006	Freshwater	Tributary of Kangaroo Creek	12/05/2022	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.005	0.014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.001	<0.005	<0.005	<0.01	<0.01	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	0.014
SW006	Freshwater	Tributary of Kangaroo Creek	12/05/2022	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0082	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0412	<0.0016	<0.004	<0.004	<0.041	<0.041	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0165
SW006	Freshwater	Tributary of Kangaroo Creek	13/05/2022	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0082	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.041	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0164
SW006	Freshwater	Tributary of Kangaroo Creek	19/10/2022	<0.002	<0.008	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW006	Freshwater	Tributary of Kangaroo Creek	19/10/2022	<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	<0.024	<0.01	<0.024	<0.024	<0.024	<0.024	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW006	Freshwater	Tributary of Kangaroo Creek	19/10/2022	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW006A	Freshwater	Tributary of Kangaroo Creek	26/07/2018	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW007	Freshwater	Kangaroo Creek	16/08/2017	<0.01	-	-	<0.01	-	<0.01	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01
SW007	Freshwater	Kangaroo Creek	27/09/2018	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0003	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.0003
SW007	Freshwater	Kangaroo Creek	28/05/2019	<0.0003	<0.0005	-	<0.0005	-	<0.0003	-	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.0003
SW007	Freshwater	Kangaroo Creek	27/10/2020	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.008	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016
SW007	Freshwater	Kangaroo Creek	20/05/2021	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.008	<0.003	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016
SW007	Freshwater	Kangaroo Creek	9/11/2021	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.008	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0008	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0016
SW007	Freshwater	Kangaroo Creek	10/05/2022	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0394	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0158
SW007	Freshwater	Kangaroo Creek	18/10/2022	<0.002	<0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW008	Estuarine	Kauri Creek	26/07/2018	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW008	Estuarine	Kauri Creek	28/09/2018	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW008	Estuarine	Kauri Creek	30/05/2019	<0.0003	<0.0005	-	<0.0005	-	<0.0003	-	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.0003
SW008	Estuarine	Kauri Creek	27/10/2020	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.008	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016
SW008	Estuarine	Kauri Creek	19/05/2021	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.002	<0.003	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016
SW008	Estuarine	Kauri Creek	10/11/2021	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.004	<0.012	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.0008
SW008	Estuarine	Kauri Creek	11/05/2022	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0397	<0.0016	<0.004	<0.04	<0.04	<0.04	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0159
SW008	Estuarine	Kauri Creek	17/10/2022	<0.002	<0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW009	Freshwater	Kangaroo Creek	9/03/2017	0.07	-	-	<0.02	-	0.07	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.07
SW009	Freshwater	Kangaroo Creek	26/07/2018	<0.01	-	-	<0.01	-	<0.02	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.02
SW009	Freshwater	Kangaroo Creek	30/05/2019	<0.0003	<0.0005	-	<0.0005	-	<0.0003	-	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.0003
SW009	Freshwater	Kangaroo Creek	27/10/2020	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.008	<0.002	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016
SW009	Freshwater	Kangaroo Creek	19/05/2021	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.006	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.108	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016
SW009	Freshwater	Kangaroo Creek	8/11/2021	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.008	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.0008	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0016
SW009	Freshwater	Kangaroo Creek	11/05/2022	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0395	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0158
SW009	Freshwater	Kangaroo Creek	19/10/2022	<0.002	<0.028	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW010	Freshwater	Mosquito Creek	16/08/2017	<0.01	-	-	<0.01	-	<0.01	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01
SW012	Estuarine	Kauri Creek	9/03/2017	0.16	-	-	<0.05	-	0.16	-	-	-	-	-	<0.005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.16
SW012	Estuarine	Kauri Creek	26/07/2018	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW012	Estuarine	Kauri Creek	29/05/2019	<0.0003	<0.0005	-	<0.0005	-	<0.0003	-	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.0003
SW012	Estuarine	Kauri Creek	26/10/2020	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.008	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016
SW012	Estuarine	Kauri Creek	19/05/2021	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.01	<0.0035	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016
SW012	Estuarine	Kauri Creek	8/11/2021	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0003	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0032	<0.0032	<0.0032	<0.008	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.001	<0.001	<0.001	<0.001	<0.0003
SW012	Estuarine	Kauri Creek	11/05/2022	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0397	<0.0016	<0.004	<0.04	<0.04	<0.04	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0159
SW012	Estuarine	Kauri Creek	17/10/2022	<0.002	<0.008	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW013	Estuarine	Snapper Creek	9/03/2017	1.16	-	-	0.08	-	1.08	-	-	-	-	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.16
SW013	Estuarine	Snapper Creek	26/07/2018	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.05	<0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW013	Estuarine	Snapper Creek	3/06/2019	0.0008	<0.0005	<0.0005	0.0005	<0.0005	0.0003	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0008
SW013	Estuarine	Snapper Creek	26/10/2020	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.008	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016
SW013	Estuarine	Snapper Creek	19/05/2021	0.003	<0.0016	<0.0016	0.003	<0.0016	<0.0016	<0.0016	<0.002	0.0027	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0057
SW013	Estuarine	Snapper Creek	8/11/2021	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0003	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0032	<0.0032	<0.0032	<0.008	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.001	<0.001	<0.001	<0.001	<0.0003
SW013	Estuarine	Snapper Creek	10/05/2022	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0012	<0.0008	<0.0041	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0082	<0.0082	<0.0205	<0.0008	<0.02	<0.02	<0.02	<0.02	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.0082
SW013	Estuarine	Snapper Creek	18/10/2022	0.009	<0.008	<0.002	0.005	<0.002	0.004	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.009
SW014	Freshwater	Tributary of Snapper Creek	15/08/2017	<0.01	-	-	<0.02	-	<0.01	-	-	-	-	-	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01
SW014	Freshwater	Tributary of Snapper Creek	28/09/2018	0.0027	<0.0005	<0.0005	0.0017	<0.0005	0.001	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0027
SW014	Freshwater	Tributary of Snapper Creek	3/06/2019	0.0038	<0.0005	<0.0005	0.0023	<0.0005	0.0015	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

				Perfluoroalkyl Sulfonic Acids						Perfluoroalkyl Carbonic Acids												Perfluoroalkyl Sulfonamides							Fluorotelomer Sulfonic Acids				
			Sum of PFHxS and PFOS	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FtS	8:2 FTS	10:2 FTS	Sum of PFAS
	Unit		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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		0.0003	0.0005	0.0005	0.0005	0.0005	0.0003	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.001	0.001	0.001	0.0005	0.0005	0.001	0.001	0.001	0.001	0.0003
NHMRC (2019) Recreational Contact with Waters			2.0											10																	
NEMP (HEPA, 2018) Ecological Freshwater 99% Species Protection								0.00023						19																	
ID	**Setting**	**Location**	**Date**																													
SW017	Rainwater	Unlined stormwater channel	3/06/2019	0.0037	0.0012	<0.0005	0.0037	<0.0005	<0.0003	<0.0005	<0.002	<0.0005	<0.0005	0.0008	0.0024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0081
SW017	Rainwater	Unlined stormwater channel	27/10/2020	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.012	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0016
SW017	Rainwater	Unlined stormwater channel	21/05/2021	0.0151	0.0169	0.0022	0.0151	<0.0016	<0.003	<0.0016	<0.008	0.017	0.0059	<0.0016	0.0072	<0.0016	0.0029	<0.0016	<0.0016	<0.0016	<0.006	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0672
SW017	Rainwater	Unlined stormwater channel	9/11/2021	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.004	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.0008
SW017	Rainwater	Unlined stormwater channel	9/05/2022	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0003	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0032	<0.0032	<0.008	<0.0005	<0.008	<0.008	<0.008	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0032
SW017	Rainwater	Unlined stormwater channel	21/10/2022	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW018	Rainwater	Unlined stormwater channel	3/06/2019	0.0089	<0.0005	<0.0005	0.0042	<0.0005	0.0047	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	0.0009	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0098
SW018	Rainwater	Unlined stormwater channel	27/10/2020	0.0021	<0.0016	<0.0016	0.0021	<0.0016	<0.0049	<0.0016	<0.008	<0.0016	<0.0016	<0.0016	0.0038	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0059
SW018	Rainwater	Unlined stormwater channel	20/05/2021	0.0159	<0.0079	<0.0079	0.0159	<0.0079	<0.0079	<0.0079	<0.04	<0.0079	0.0143	<0.0079	<0.0079	<0.0079	<0.0079	<0.0079	<0.0079	<0.0079	<0.0198	<0.0079	<0.02	<0.02	<0.02	<0.02	<0.0079	<0.0079	<0.008	0.013	<0.008	<0.008	0.0432
SW018	Rainwater	Unlined stormwater channel	9/11/2021	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.004	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.0008
SW018	Rainwater	Unlined stormwater channel	9/05/2022	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0022	<0.0008	<0.004	<0.0035	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.002	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.0008
SW018	Rainwater	Unlined stormwater channel	21/10/2022	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW019	Rainwater	Ponded water along track	30/05/2019	0.116	0.004	-	0.0665	-	0.05	-	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	0.1205
SW019	Rainwater	Ponded water along track	28/10/2020	0.0741	0.0025	0.0019	0.0433	<0.0016	0.0308	<0.0016	<0.008	<0.004	0.0027	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0812
SW019	Rainwater	Ponded water along track	20/05/2021	0.0063	<0.0016	<0.0016	0.0036	<0.0016	0.0027	<0.0016	<0.008	<0.0025	<0.002	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0063
SW019	Rainwater	Ponded water along track	9/11/2021	0.0026	<0.0008	<0.0008	0.0008	<0.0008	0.0018	<0.0008	<0.004	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0020	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	0.0026
SW019	Rainwater	Ponded water along track	9/05/2022	0.0354	<0.003	<0.002	0.0197	<0.0016	0.0157	<0.0016	<0.008	<0.0016	<0.003	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.016	<0.016	<0.04	<0.0016	<0.04	<0.04	<0.04	<0.04	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0354
SW019	Rainwater	Ponded water along track	20/10/2022	0.027	<0.014	<0.009	0.015	<0.009	0.012	<0.009	<0.04	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.022	<0.009	<0.022	<0.022	<0.022	<0.022	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	0.027
SW020	Freshwater	Private dam	15/08/2019	<0.002	0.011	<0.002	<0.002	<0.002	<0.002	<0.002	0.03	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.044
SW020	Freshwater	Private dam	29/10/2020	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	0.0021	0.0011	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0024	<0.001	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0032
SW021	Freshwater	Private dam	15/08/2019	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.03	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.03
SW021	Freshwater	Private dam	13/10/2020	0.0043	<0.0016	<0.0016	<0.0016	<0.0016	0.0043	<0.0016	<0.008	0.0043	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0086
SW021	Freshwater	Private dam	18/05/2021	0.0056	<0.0016	<0.0016	0.0016	<0.0016	0.004	<0.0016	<0.008	<0.004	0.0021	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.112	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0077
SW021	Freshwater	Private dam	11/11/2021	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	<0.0032
SW021	Freshwater	Private dam	13/05/2022	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.004	<0.0008	<0.004	<0.0015	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.02	<0.0008	<0.002	<0.002	<0.02	<0.02	<0.008	<0.008	<0.001	<0.001	<0.001	<0.001	<0.0008
SW021	Freshwater	Private dam	19/10/2022	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW022	Freshwater	Private dam	13/09/2019	0.0096	0.0008	<0.0005	0.0048	<0.0005	0.0048	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0114
SW022	Freshwater	Private dam	13/10/2020	0.0093	<0.0016	<0.0016	0.0036	<0.0016	0.0057	<0.0016	<0.008	0.0052	0.0022	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0167
SW022	Freshwater	Private dam	18/05/2021	0.0076	<0.0016	<0.0016	0.003	<0.0016	0.0046	<0.0016	<0.016	0.0133	0.0024	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0085	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0233
SW022	Freshwater	Private dam	11/11/2021	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	<0.0032
SW022	Freshwater	Private dam	12/05/2022	<0.0008	<0.0008	<0.0008	<0.0015	<0.0008	<0.0012	<0.0008	<0.004	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.02	<0.0008	<0.02	<0.02	<0.02	<0.02	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.008
SW022	Freshwater	Private dam	19/10/2022	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW023	Freshwater	Private dam	13/09/2019	0.0058	<0.0005	<0.0005	0.0032	<0.0005	0.0026	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.0065
SW023	Freshwater	Private dam	13/10/2020	0.0067	<0.0016	<0.0016	0.0028	<0.0016	0.0039	<0.0016	<0.008	0.0053	0.0019	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0139
SW023	Freshwater	Private dam	18/05/2021	0.0057	<0.0016	<0.0016	0.0027	<0.0016	0.003	<0.0016	<0.012	0.0177	0.0032	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0266
SW023	Freshwater	Private dam	11/11/2021	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	<0.0032
SW023	Freshwater	Private dam	12/05/2022	0.0117	<0.0008	<0.0008	0.0074	<0.0008	0.0043	<0.0008	<0.006	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.02	<0.0008	<0.02	<0.02	<0.02	<0.02	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	0.0117
SW023	Freshwater	Private dam	19/10/2022	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW024	Freshwater	Private dam	13/09/2019	0.0013	<0.0005	<0.0005	<0.0005	<0.0005	0.0013	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	0.0027	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.004
SW024	Freshwater	Private dam	29/10/2020	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.008	<0.005	<0.0016	<0.0016	0.002	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.002
SW024	Freshwater	Private dam	19/05/2021	0.0025	<0.0016	<0.0016	<0.0016	<0.0016	0.0025	<0.0016	<0.012	<0.005	<0.003	<0.0016	0.0025	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0025	<0.035	<0.0016	<0.004	<0.004	<0.004	<0.005	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0066
SW024	Freshwater	Private dam	11/11/2021	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	<0.0032
SW025	Freshwater	Unnamed Waterway in Wallu	12/09/2019	0.0044	<0.0005	<0.0005	0.0015	<0.0005	0.0029	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	0.005
SW025	Freshwater	Unnamed Waterway in Wallu	28/10/2020	0.0046	<0.0016	<0.0016	0.0016	<0.0016	0.003	<0.0016	<0.008	<0.003	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0046
SW025	Freshwater	Unnamed Waterway in Wallu	19/05/2021	0.0051	<0.0016	<0.0016	0.0017	<0.0016	0.0034	<0.0016	<0.008	<0.0045	0.0017	<0.0016	0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0039	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0084
SW025	Freshwater	Unnamed Waterway in Wallu	9/11/2021	0.0024	<0.0016	<0.0016	<0.0016	<0.0016	0.0024	<0.0016	<0.008	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0024
SW025	Freshwater	Unnamed Waterway in Wallu	13/05/2022	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0026	<0.0016	<0.0081	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0163	<0.0163	<0.0406	<0.0016	<0.041	<0.041	<0.041	<0.041	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0163
SW025	Freshwater	Unnamed Waterway in Wallu	19/10/2022	0.003	<0.008	<0.002	<0.002	<0.002	0.003	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.003
SW027	Freshwater	Discharge point from Base	28/10/2020	0.0124	<0.0032	<0.0032	0.0057	<0.0032	0.0067	<0.0032	<0.016	<0.0065	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.008	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	0.0124
SW027	Freshwater	Discharge point from Base	18/05/2021	0.0202	0.0021	<0.0016	0.0125	<0.0016	0.0077	<0.0016	<0.02	0.0072	0.0066	<0.0016	0.0021	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.004	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0382
SW027	Freshwater	Discharge point from Base	9/11/2021	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0032	<0.0080	<0.0032	<0.008	<0.008	<0.008	<0.008	<0.0032	<0.0032	<0.003	<0.003	<0.003	<0.003	<0.0032
SW027	Freshwater	Discharge point from Base	11/05/2022	0.0086	<0.001	<0.001	0.0039	<0.001	0.0047	<0.001	<0.005	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.001	<0.005	<0.005	<0.01	<0.01	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	0.0186
SW027	Freshwater	Discharge point from Base	11/05/2022	<0.003	<0.003	<0.003	<0.004	<0.003	<0.0112	<0.003	<0.0151	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.0076	<0.003	<0.008	<0.008	<0.008	<0.008	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
SW027	Freshwater	Discharge point from Base	11/05/2022	<0.0031	<0.0031	<0.0031	<0.0035	<0.0031	<0.01	<0.0031	<0.0153	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0076	<0.0031	<0.008	<0.008	<0.008	<0.008	<0.0031	<0.0031	<0.003	<0.003	<0.003	<0.003	<0.0031
SW027	Freshwater	Discharge point from Base	19/10/2022	0.01	<0.024	<0.002	0.006	<0.002	0.004	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.01
SW027	Freshwater	Discharge point from Base	19/10/2022	<0.005	<0.028	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SW027	Freshwater	Discharge point from Base	19/10/2022	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

LOR is limit of reporting
µg/L is micrograms per litre
'-' denotes no analysis undertaken
'<' denotes concentration is less than
The LOR for PFOS is higher than the NEMP (2020) ecological guideline value for 99% species protection. PFOS concentrations
Blue shading indicates first time detection.

		Analyte	PFHxS + PFOS	Perfluoroalkyl Sulfonic Acids						Perfluoroalkyl Carbonic Acids											Perfluoroalkyl Sulfonamides							Fluorotelomer Sulfonic Acids				Sum of PFAS
				PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	
		Unit		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	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002
ID	Field ID	Sample Date																														
SD001	0224_SD001_170308	8/03/2017	<0.0002	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002
SD002	0224_SD002_170816	16/08/2017	<0.0002	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002
SD003	0224_SD003_170308	8/03/2017	<0.0002	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002
SD004	0224_SD004_170816	16/08/2017	<0.0002	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002
SD004	0224_SD004_210519	18/05/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD004	0224_SD004_220511	11/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD005	0224_SD005_170815	15/08/2017	<0.0002	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002
SD005	0224_SD005_210519	18/05/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD005	0224_SD005_220511	11/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD006	0224_SD006_170309	9/03/2017	<0.0002	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002
SD006	0224_SD006_180928	28/09/2018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD006	0224_SD006_210520	18/05/2021	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002	<0.001	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0007
SD006	0224_SD006_220512	12/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD006	0224_QC127_220512	12/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD006	0224_QC227_220512	12/05/2022	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.001	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.002	<0.001
SD007	0224_SD007_170816	16/08/2017	<0.0002	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002
SD007	0224_SD007_180927	27/09/2018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD007	0224_SD007_210520	18/05/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD007	0224_SD007_220510	10/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD008	0224_SD008_210519	18/05/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD008	0224_SD008_220511	11/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD009	0224_SD009_170309	9/03/2017	<0.0002	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002
SD009	0224_SD009_180927	27/09/2018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD009	0224_SD009_210519	18/05/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.0002	<0.0004	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0012	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0005
SD009	0224_SD009_220511	11/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD010	0224_SD010_170816	16/08/2017	<0.0002	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002
SD012	0224_SD012_170309	9/03/2017	<0.0002	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002
SD012	0224_SD012_180928	28/09/2018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD012	0224_SD012_210519	18/05/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD012	0224_SD012_220511	11/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD013	0224_SD013_170309	9/03/2017	<0.0002	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002
SD013	0224_SD014_170815	15/08/2017	<0.0002	-	-	-	-	<0.0002	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0002
SD013	0224_SD013_180928	28/09/2018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD013	0224_SD013_210519	18/05/2021	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0002
SD013	0224_SD013_220510	10/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD014	0224_SD014_210519	18/05/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD014	0224_SD014_220510	10/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD014	0224_QC121_220510	10/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD014	0224_QC221_220510	10/05/2022	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.001	<0.005	<0.005	<0.005	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.002	<0.001
SD015	0224_SD015_180928	28/09/2018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD016	0224_SD016_180928	28/09/2018	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD016	0224_SD016_210519	18/05/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD016	0224_SD016_220512	12/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD017	0224_SD017_190530	30/05/2019	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD017	0224_SD017_210521	18/05/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0003
SD017	0224_SD017_220509	9/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD018	0224_SD018_210520	18/05/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.0002	<0.001	<0.0002	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0003
SD018	0224_SD018_220509	9/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD019	0224_SD019_210520	18/05/2021	0.0008	<0.0002	<0.0002	<0.0002	<0.0002	0.0008	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0008
SD019	0224_SD019_220509	9/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD021	0224_SD021_210518	18/05/2021	0.0012	<0.0005	<0.0005	<0.0005	<0.0005	0.0012	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0013	<0.0005	<0.0013	<0.0013	<0.0013	<0.0013	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0012
SD021	0224_SD022_220513	13/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD022	0224_SD022_210518	18/05/2021	0.0009	<0.0002	<0.0002	<0.0002	<0.0002	0.0009	<0.0002	<0.001	<0.0002	0.0007	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0016
SD022	0224_SD022_220512	12/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD023	0224_SD023_210518	18/05/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0004	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD023	0224_SD023_220512	12/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0002	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD024	0224_SD024_210519	19/05/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0002
SD025	0224_SD025_190912	12/09/2019	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD025	0224_SD025_210519	18/05/2021	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD025	0224_SD025_220512	12/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD027	0224_SD027_210518	18/05/2021	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	0.0005
SD027	0224_SD027_220511	11/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD027	0224_QC125_220511	11/05/2022	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD027	0224_QC225_220511	11/05/2022	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.001	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.002	<0.001

LOR is limit of reporting
mg/kg is milligrams per kilogram
-' denotes no analysis undertaken
<' denotes concentration is less than
Blue shading indicates first time detection.

Location ID	Sample Date	DO (mg/L)	EC (µS/cm)	pH	E_r (mV)	E_h (mV)	Temp (°C)	Turbidity	Odour	Sheen
OTH001	20/05/2021	5.58	976	8.05	97.1	302.1	21.9	Clear	No odour	No sheen
OTH001	10/11/2021	5.4	879	6.93	420.1	625.1	25.5	Clear	No odour	No sheen
OTH001	10/05/2022	4.63	1549	8.6	589	794	21.9	Clear	No odour	No sheen
OTH001	20/10/2022	3.57	502.3	7.02	104.6	309.6	22.1	Clear	No odour	No sheen

Notes
DO is dissolved oxygen
EC is electrical conductivity
E_h is oxidation reduction potential
Oxidation reducation potential (E_r) measured with a platinum electrode and a silver/silver chloride reference electrode (E_r) and converted to E_h by E_h
Temp is Temperature
µS/cm is microsiemens per centrimetre
ºC is degrees Celcius
mV is millivolts
` - No data

			Perfluoroalkyl Sulfonic Acids						Perfluoroalkyl Carbonic Acids												Perfluoroalkyl Sulfonamides							Fluorotelomer Sulfonic Acids				
		Sum of PFHxS and PFOS	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFHxDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSA	EtFOSA	MeFOSE	EtFOSE	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FtS	8:2 FTS	10:2 FTS	Sum of PFAS
	Unit	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.01	0.002	0.002	0.002	0.002	0.002	0.002	0.005	0.002	0.002	0.002	0.005	0.002	0.005	0.005	0.005	0.005	0.002	0.002	0.005	0.005	0.005	0.005	0.002
NEMP (HEPA, 2020) Human Health Drinking Water		0.07											0.56																		
NHMRC (HEPA, 2020) Human Health Recreational Water		**2.0**											**10**																		
NEMP (HEPA, 2020) Ecological Freshwater 99% Species Protection							0.00023						19																		
OTH001	WWTP	0224_QC114_190528	EB1913917	Field_D	0.0091	0.0075	-	0.0079	-	0.0012	-	<0.002	0.0082	0.0066	0.0024	0.0064	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	0.0402
OTH001	WWTP	0224-QC214-190529	RN1235762	Interlab_D	0.011	0.0049	0.0013	0.011	<0.001	<0.002	<0.001	0.0093	0.015	0.0056	0.0036	0.0068	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001	<0.002	<0.002	<0.005	<0.005	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	0.0403
OTH001	WWTP	0224_WWTP_190529	EB1913917	Normal	0.0089	0.0094	-	0.0078	-	0.0011	-	<0.002	0.0077	0.0058	0.0025	0.0063	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	0.0406
OTH001	WWTP	0224_OTH001_201028	EB2028561	Normal	<0.01	<0.04	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	0.02	<0.02	<0.02	<0.01	<0.02	<0.02	-	<0.05	<0.02	<0.02	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.02
OTH001	WWTP	0224_OTH001_210520	EB2114447	Normal	<0.01	<0.04	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.03	<0.02	<0.01	<0.02	<0.02	-	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
OTH001	WWTP	0224_OTH001_211110	EB2132641	Normal	<0.01	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02		<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
OTH001	WWTP	0224_OTH001_220510	EB2213545	Normal	0.01	<0.04	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.03	<0.02	<0.01	<0.02	<0.02	-	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.01
OTH001	WWTP	0224_OTH001_220825	EB2225015	Normal	0.02	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02		<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.02
OTH001	WWTP	0224_OTH001_220825	EB2225015	Duplicate	0.02	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02		<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.02
OTH001	WWTP	0224_OTH001_220825	ES2231048	Triplicate	0.02	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02		<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.02
OTH001	WWTP	0224_OTH001_221020	EB2231148	Normal	0.02	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02		<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.02

Appendix C

Infrastructure Projects at Wide Bay Training Area in 2022

Appendix C Infrastructure Projects at Wide Bay Training Area in 2022

Date	Location	Activity
2022	ADP-050 (J1545) Multiple Tracks and Toilets Project.	A number of tracks in the WBTA, and up to eight enviro toilets will be placed within the training area. Will involve grading, repair of tracks; soil disturbance, potential temporary stockpiling; changes to water inputs from the toilets when land irrigation areas or selected/tank systems selected. Effluent disposal report, soil contamination, flora and fauna reports were completed by March 2022. As of January 2023, the construction phase has not started.
2022	EMOS AE547 – Multi User Firing Point Replenishment Project.	This project was to replenish movers and firing range mounds at the multi user firing point. This was completed in 2022.
2022	EMOS AE547 – Electronic Classification Range Reshaping Project.	This project is to reshape the 600m Electronic Classification Range and replenishment of 100m and 200m firing mounds. Soil was not removed from Base. The works were not completed in 2022.
2022	EST08878 EMOS Roads Grade and Roll Project.	This project was to grade roads. The status is uncertain and this project may have changed into flood damage works in February 2022.
2022	EST08100 Training Area Ranges Refurbishment Project (AGR/SGR and DFSW).	The purpose of this project is to bring up to current safety standards/requirements of Ranges. The project involves cleaning out of current bio-basin, changes to drainage/sub-surface irrigation off the throwing bay into newly devised sedimentation structure. The works included soil contamination testing completed to understand what contamination risks are coming from the throwing bay. The construction phase was between March and October 2022.
2022	6ESR construction activity.	These unit works, undertaken during 2022 included safety works to the White Quarry and altering benching. Excess material has been stored in the middle level of the quarry.
2022	EST08192 – WBTA Roads Refurbishments (Route 5, Gate 12 to Route 20) Project.	Construction works started in October 2022 and, as of January 2023, are ongoing.
2022	EST08193 – WBTA Fencing Gate 9 to Gate 14.	Project will realign fence onto boundary and will involve ground disturbance, vegetation disturbance on the western side of the Training Area. Has reached 90% design with construction to start later in 2023.
2022	SPO – ADP – 103 forward operational base demolition.	Forward operational base was demolished between March and July 2022. The area is now an open brown field.

Date	Location	Activity
2022	EST08326 Ammo Point Repair, Route 20 and 15 repair, new TA13 track.	Project in early design stages and waiting on 30% design.
2022	Flood repair work – various.	Works in a number of causeways along the Base roads, including substantial changes to drainage at Castle Bridge on Route 20 including repairing erosion and damage from upstream into the Training Area from the February 2022 floods. Flood repair works to the biobasin requiring removal of soil within a large area (hundreds of square metres). Some contaminated land investigation has been completed. Project is currently on hold.
2022	Trenching by 8/9 RAR for Ex Ram Horn	Extensive trenching to level 3 in the area to the west of the southern sentry car park.

Appendix D

Sampling Event Factual Reports

Prepared for
Department of Defence
ABN: 68706814312

Sampling Event Factual Report, May 2022

PFAS OMP - Wide Bay Training Area

13-Dec-2022
Doc No. 60612563_RP_053_4_221213

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Delivering a better world

Sampling Event Factual Report, May 2022

PFAS OMP - Wide Bay Training Area

Client: Department of Defence

ABN: 68706814312

Prepared by

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13-Dec-2022

Job No.: 60612563

Quality Information

Document	Sampling Event Factual Report, May 2022
Ref	60612563
Date	13-Dec-2022
Prepared by	[redacted]
Reviewed by	[redacted]

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
0	15-Jun-2022	Draft	[redacted]	
1	24-Jun-2022	Draft		
2	22-Jul-2022	Draft		
4	13-Dec-2022	Final		[redacted]

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Abbreviation	
ALS	Australian Laboratory Services
ASC NEPM	Assessment of Site Contamination National Environment Protection Measure 1999 (as amended 2013)
COC	Chain of Custody
DCMM	Defence Contamination Management Manual
Defence	Department of Defence
DO	Dissolved oxygen
EC	Electrical conductivity
HEPA	Heads of Environmental Protection Agencies
IP	Interface probe
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
OMP	Ongoing management plan
ORP	Oxidation reduction potential
PFAS	Per- and poly-fluorinated alkyl substances
PFHxS	Perfluorohexane sulfonate
PFOA	Perflurooctanoic acid
PFOS	Perflurooctanesulfonic acid
PMAP	PFAS management area plan
POL	Paints, oil and lubricants
QA/QC	Quality assurance / quality control
QLD	Queensland
RPD	Relative percent difference
SAQP	Sampling analysis and quality plan
SWL	Standing water level
WBTA	Wide Bay Training Area
WWTP	Wastewater treatment plant

Units of Measurement			
L	Litres	m	Metres
mg	Milligram	ha	Hectares
kg	Kilogram	µg	Microgram
mV	Millivolts		

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) has been engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Program (OMP) (Defence, 2020) at the Wide Bay Training Area (WBTA) (the 'Site') and the WBTA Management Area in the South Queensland Region. The locations of the Site and the Management Area are shown in **Figure 1** in **Appendix A**. The OMP for WBTA includes the following sampling events:

- Biannual sampling events[1] in October 2020, April 2021, October 2021, April 2022, October 2022 and April 2023 including:
  - groundwater sampling of 17 on-Site groundwater monitoring wells and five off-Site groundwater monitoring wells
  - surface water sampling of creeks and dams at 13 on-Site and seven off-Site sampling locations[2]
  - tap sampling of the two on-Site groundwater extraction bores
  - tap sampling of the treated wastewater from the outlet tap of the Camp Kerr wastewater treatment plant (WWTP).
- Sediment samples (co-located with the surface water samples) at creeks and dams to be collected once per year in April 2021, April 2022 and April 2023.
- Up to two event-based sampling of the WWTP during times of high site usage.

Following each sampling event, a sampling event factual report will be prepared. 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 biannual sampling event completed in May 2022, specifically highlighting any first-time detections and/or first-time exceedances of human health or ecological (freshwater species) screening criteria for PFHxS+PFOS and / or PFOA.

The sampling event presented in this report was planned for April 2022, however it was delayed until May 2022 due to training activities within the WBTA Management Area preventing safe access to the base.

This report has been prepared in accordance with the *PFAS OMP Factual Report Guidance,* v0.2, May 2021 (Defence, 2021).

1.2 Objectives

The objectives of the OMP program are to:

- Implement the OMP prepared as part of the PFAS Management Area Plan (PMAP); and
- Collect data that will enable Defence to maintain an up-to-date understanding of the distribution, concentration and transport of PFAS at the Site and WBTA Management Area.

The data will assist in the timely identification of risks and inform Defence's approach to the management of PFAS, including updates and revisions to the PMAP.

[1] Due to training exercises at the Base preventing safe access to sampling locations, three of the four sampling events completed to date have been conducted one month later than scheduled, occurring in October 2020, May 2021, November 2021 and May 2022.
[2] The OMP specifies 13 on-Site and seven off-Site surface water / sediment sampling locations. However, one of the surface water / sediment sampling locations has been removed as the stakeholder declined access permission. The latest version of the SAQP [Rev 6] (AECOM, 2022a) identifies six off-Site surface water / sediment sampling locations.

The objective of this phase of works is to implement the scope of works for the biannual May 2022 sampling event (identified in **Section 2.0**) in accordance with the Sampling and Analysis Quality Plan (SAQP) (AECOM, 2022a).

2.0 Scope of Work

The biannual sampling event at WBTA was completed in accordance with the SAQP (AECOM, 2022a [Rev 6]). In summary, the scope of work for this sampling event included:

- Obtaining access to private properties where some surface water 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) (Heads of Environmental Protection Authorities [HEPA], 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.
- Gauging of groundwater level at 22 locations including 17 on-Site and five off-Site monitoring wells (located on Council / State land) prior to collection of samples[3] (refer to **Table 1** below, and **Figure 2** and **Figure 3** in **Appendix A** for specific locations).
- Tap sampling of the two on-Site groundwater extraction bores (refer to **Table 1** below and **Figure 3** in **Appendix A** for specific locations).
- Tap sampling of the treated wastewater from the outlet tap of the Camp Kerr WWTP (refer to **Table 2** below and **Figure 3** in **Appendix A** for specific location).
- Collection of surface water and sediment samples at 19 locations including 13 on-Site and six off-Site locations (refer to **Table 3** below, and **Figure 2** and **Figure 3** in **Appendix A**). One off-Site location (SW024/SD024) was not accessible as the stakeholder declined access, refer to **Table 9**.
- Collecting field quality control samples including field duplicate and triplicate samples at a rate of 1 in 10 primary samples and collecting one rinsate sample per fieldwork day as per the SAQP.
- Analysis of all groundwater samples for the PFAS suite at the standard limit of reporting (LOR).
- Analysis of all surface water samples for the PFAS suite at trace levels of detection.
- Analysis of the WWTP outlet sample for the PFAS suite at the standard LOR.
- Data management of all OMP field and laboratory data in the Defence ESdat database.
- Preparation of results letters for off-site stakeholders.
- Preparation of this Sampling Event Factual Report.

[3] Two groundwater sampling locations, POT001 and POT005, have pumps installed and consequently groundwater levels cannot be gauged.

Table 1 Groundwater Sampling Locations

Location	Monitoring Well
Paints, oils and lubricants (POL) Refuelling point	MW101, MW102, MW115
Airfield	MW103, MW104, MW105
Southern site boundary	MW106
Electronic Classification Range	MW107
Landfill 1	MW108
Eastern site boundary	MW109
Multiuser Firing Point Range	MW110
Possible demonstration area	MW111
WWTP discharge areas	MW112, MW113*, MW114*, MW120, MW121, MW122
Central portion of Camp Kerr	MW119
Down-gradient / cross-gradient of Camp Kerr	MW116*, MW117*, MW118*
Water treatment plant	POT001, POT005
Note: * denotes off-site sampling location	

Table 2 Wastewater Sampling Locations

Description	Tapwater Sampling Locations
Wastewater treatment plant outlet	OTH001

Table 3 Surface Water and Sediment Sampling Locations

Area	Description	Surface Water Sampling Locations
Creek	Kauri Creek	SW/SD004, SW/SD008, SW/SD012
	Mosquito Creek	SW/SD005
	Kangaroo Creek	SW/SD006, SW/SD07, SW/SD009
	Snapper Creek	SW/SD013, SW/SD014, SW/SD016
Drainage Channel	Site entrance (receives runoff from WWTP discharge areas)	SW/SD017
	Vehicle wash point drainage channel	SW/SD018
	Ponded water from surface water flows flowing overland from Camp Kerr	SW/SD019
	Drainage pipe at Clyde Road discharging runoff from Camp Kerr to residential dam	SW/SD027*
	Ephemeral waterway draining residential dams in Wallu	SW/SD025*
Dams	Residential dams in Wallu	SW/SD021*, SW/SD022*, SW/SD023*, SW/SD024*
Note: * denotes off-site sampling location		

3.0 Methodology

The methodology used for the May 2022 sampling event was in accordance with the SAQP (AECOM, 2022a) and is summarised below.

3.1 Groundwater Sampling Methodology

Table 4 Groundwater 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. Due to ongoing training activities in different areas of the Base at the time of the fieldworks, areas of the Base were only accessible at specific times/days. Consequently, groundwater gauging data were collected over several days, between 09 and 13 May 2022.
Groundwater quality parameter field measurements	Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation-reduction potential (ORP), pH and observations of water quality were recorded for all groundwater samples. Equipment calibration certificates are provided in **Appendix F**.
Sampling methodology	Groundwater samples were collected from all monitoring wells using no-purge methodology HydraSleeves™, which were installed within the screened interval of each well, approximately 1 m above the base of the well (the target depth is shown in **Table T1** in **Appendix A**), for a minimum of 24 hours prior to the sampling round. Once sampling was completed, new HydraSleeves™ were deployed at the screened interval depth in preparation for the next sampling round. Tap samples from extraction bores were collected by opening the tap / valve and allowing the water to run for approximately three minutes prior to sample collection. Water samples were collected by placing the laboratory provided sample bottle beneath the tap outlet.
Sample analysis	All primary samples were submitted for PFAS suite using the standard levels of detection. ALS Environmental (ALS) Brisbane, Queensland 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 groundwater analyses were certified by the National Association of Testing Authorities (NATA). Chain of custody (COC) forms and laboratory certificates are presented in **Appendix D** and **Appendix E** respectively.
QA/QC Samples	Field quality assurance (QA) / quality control (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 QA/QC sample data.

3.2 Surface Water Sampling Methodology

Table 5 Surface Water Sampling Methodology

Item	Details
Surface water parameter field measurements	Temperature, electrical conductivity, dissolved oxygen, oxidation-reduction potential, pH and observations of water quality were recorded for all surface water samples. Equipment calibration certificates are provided in **Appendix F**.
Sampling methodology	Samples were collected from immediately 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 with the cap immediately applied once the container was full.
Sample analysis	All primary samples were submitted for PFAS suite using the trace levels of detection. ALS Brisbane, Queensland was used as the primary laboratory. NMI of Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for groundwater analyses were certified by the NATA. COC forms and laboratory certificates are presented in **Appendix D** and **Appendix E** respectively.
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 C** for assessment of QA/QC sample data.

3.3 Sediment Sampling Methodology

Table 6 Sediment Sampling Methodology

Item	Details
Sampling methodology	Samples representative of sediments were collected co-located with surface water samples. Sediment samples were by gloved hand or using a trowel. At each location, a new laboratory supplied container was used for each sample.
Logging	Sediment characteristics were recorded for each sample.
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 C** for assessment of QA/QC sample data.
Sample analysis	All primary samples were submitted for PFAS suite using the standard levels of detection. ALS Brisbane, Queensland was used as the primary laboratory. NMI of Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for groundwater analyses were certified by the NATA. COC forms and laboratory certificates are presented in **Appendix D** and **Appendix E** respectively.

3.4 Wastewater Sampling Methodology

Table 7 Wastewater Sampling Methodology

Item	Details
Locations sampled	OTH001 was collected from an outlet at the WWTP.
Sampling methodology	The tap/valve was opened and water allowed to run for approximately one minute prior to a sample being collected. A laboratory provided sample bottle was placed beneath the tap outlet. The sample bottle was filled to the top to ensure no headspace and the cap was immediately applied. The sample bottle was immediately placed in a cooler with cooling media.
Sample analysis	The sample was submitted for PFAS suite using the standard levels of detection.

3.5 Adopted Screening Criteria

Adopted screening criteria references national guidance in the form of the PFAS National Environmental Management Plan (NEMP), Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset includes the following:

- PFAS NEMP v2.0 (HEPA, 2020)
- Department of Health, 2019. Health Based Guidance Values for PFAS for use in site investigations in Australia. April 2017 [updated 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.

The adopted PFAS screening criteria to assess the data generated as part of the OMP are presented in **Table 8** below.

Table 8 Summary of Adopted Screening Criteria

Pathway	Compound	Criteria	Comment / Reference
Human Health Receptors			
Drinking water - groundwater	PFOS + PFHxS	0.07 µg/L	The values are from 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 are from NHMRC (2019). *All surface water and WWTP (OTH001) results will be compared to these criteria.*
	PFOA	10 µg/L	
Ecological Receptors			
Freshwater / marine water (99% species protection values)	PFOS	0.00023 µg/L	The values are from the 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 (except SW025), groundwater and WWTP (OTH001) results will be compared to these criteria.*
	PFOA	19 µg/L	
Freshwater / marine water (95% species protection values)	PFOS	0.13 µg/L	Surface water in the ephemeral waterway south of Clyde Road (SW025) should be screened against freshwater ecological guidelines for slight to moderately disturbed ecosystems (95% species protection).
	PFOA	220 µg/L	

There are no human health or ecological guideline values available for sediment.

3.6 Data Quality Objectives and Data Validation

The data quality objectives and data quality indicators adopted for these works are presented in the SAQP (AECOM, 2022a).

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

The 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 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 (Defence 2018, amended August 2021) requirements.

3.7 Deviations from the SAQP

Table 9 lists the deviations from the SAQP (AECOM, 2022a) during this sampling event.

Table 9 Deviations from the SAQP during the May 2022 Sampling Event

SAQP	Sampling Event
The biannual event was scheduled for April 2022	The sampling event was delayed until May 2022 due to ongoing training activities at WBTA.
Surface water and sediment sampling at 19 locations	Sample SW024/SD024 could not be collected as the stakeholder declined access. The non-sampling of this location is not considered to have a large impact as a downstream location was monitored during the sampling event.

4.0 Field Observations and Results

The May 2022 biannual sampling event was completed between 09 and 13 May 2022. The results are summarised in following sections.

4.1 Groundwater

4.1.1 Groundwater Observations and Quality Parameter Field Measurements

Table 10 Groundwater Observations and Quality Parameter Field Measurements

Compound	Criteria
Access	All monitoring wells and bores were accessible.
Monitoring Well Network	Covers to the groundwater monitoring wells were noted to be in good condition at the time of sampling.
Field Observations	With one exception, no visible or olfactory indications of contamination were observed during the sampling of the groundwater monitoring wells. A septic odour was recorded during the sampling of MW108. Field observations are presented **Table T1** in **Appendix B**.
Depth to Groundwater	Depth to groundwater in the monitoring wells was between 0.457 (MW109) metres below top of casing (mbtoc) and 11.507 mbtoc (MW101). Groundwater elevations in these wells were between 8.75 metres above Australian Height Datum (mAHD) (MW109) and 73.33 mAHD (MW119). Groundwater gauging data are presented in **Table T1** in **Appendix B**.
Groundwater Flow Direction	Inferred groundwater contours and groundwater flow directions in the greater WBTA area in May 2022 are shown on **Figure 4** in **Appendix A**. The inferred local groundwater flow direction is generally from the southwest to the northeast, towards Tin Can Bay Inlet. Inferred groundwater contours and groundwater flow directions within and immediately adjacent to Camp Kerr between 09 and 13 May 2022 are shown on **Figure 5** in **Appendix A**. A groundwater divide appears to be present in the central portion of Camp Kerr with groundwater to the east of the groundwater divide flowing towards the east. Groundwater to the west of the groundwater divide appears to be flowing to the west and southwest towards Wallu, and towards the south. The observed groundwater divide is consistent with that observed in previous investigations (AECOM, 2020) and previous OMP sampling events in October 2020, May 2021 and November 2021 (AECOM, 2022b).
Groundwater Quality Parameter Field Measurements	Groundwater quality parameters were measured prior to collecting groundwater samples. The readings are presented in **Table T1** in **Appendix B** and are summarised below: • Electrical conductivity ranged from 67 µS/cm (MW112) to 572 µS/cm (MW105) indicating fresh conditions. • pH ranged from 4.3 (MW106) to 6.8 (POT001) with a mean pH of 5.2 generally indicating acidic conditions. • Corrected redox ranged from 116.1 mV (MW108) to 477 mV (MW122) indicating mildly to moderately reducing conditions. • Temperature ranged from 19.5°C (POT001) to 23.5°C (MW108). • The dissolved oxygen results ranged between 0.22 mg/L (MW117) and 3.81 mg/L (MW106) indicating poorly to moderately oxygenated conditions.
Weather Conditions	Weather conditions during groundwater sampling were wet with heavy rainfall on four of the five days. There was a total of 157.6 mm of rainfall during this period.

Compound	Criteria
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.

4.1.2 PFAS Groundwater Analytical Results

The PFAS groundwater analytical results from this sampling event are presented in **Table T2** in **Appendix B**. There was one first-time detection of PFAS in the samples in the May 2022 sampling event. This was the detection of sum of PFHxS and PFOS at 0.02 µg/L in the sample from MW109. There was one first-time exceedance of the human health guideline value for sum of PFHxS and PFOS. This was the sample from MW118 which reported sum of PFHxS and PFOS at a concentration of 0.09 µg/L. Duplicate and triplicate samples were collected and analysed from MW118 and reported sum of PFHxS and PFOS concentrations to be 0.07 µg/L and 0.038 µg/L, respectively. The locations of MW118 and MW109 are shown on **Figure 6** and **Figure 7**, respectively, in **Appendix A**.

Three groundwater samples exceeded the HEPA (2020) drinking water guideline value for sum of PFHxS and PFOS (MW118, MW121 and MW122). Four groundwater samples (MW109, MW118, MW121 and MW122) also reported PFOS above the limit of reporting at a concentration that exceeded the HEPA (2020) ecological guideline value for 99% protection of freshwater species. There were no exceedances of the human health or ecological guidelines values for PFOA.

With the exception of PFHxS, no PFAS compounds were detected at concentrations that exceeded the limit of reporting in groundwater samples from the two extraction bores, Bore 1 (POT001) and Bore 2 (POT005). PFHxS was detected at concentrations of 0.03 µg/L and 0.02 µg/L in Bores 1 and 2, respectively. Sum of PFHxS+PFOS, PFOS and PFOA concentrations did not exceed the human health or ecological guideline values in these potable water samples.

Table 11 Deviation from Historical Groundwater Dataset

Deviation Type	Monitoring wells/bores	Sum of PFHxS+PFOS concentration (µg/L)		PFOA concentration (µg/L)	
		May 2022	Historical maximum	May 2022	Historical maximum
First-time detection	MW109	0.02	<0.01	<0.01	<0.01
First-time exceedance of human health guideline value	MW118	0.09	0.03	<0.01	<0.01

Note: Blue shading indicates a sampling detection with a first-time detection of PFOS + PFHxS or PFOA. Yellow shading indicates first-time exceedance of the human health guideline value.

4.2 Surface Water

4.2.1 Surface Water Observations and Quality Parameter Field Measurements

Table 12 Surface Water Observations and Quality Parameter Field Measurements

Compound	Criteria
Access	Except for SW024, all surface water sampling locations were accessible during the May 2022 sampling event. Prior to conducting sampling on private properties, access permissions were obtained from stakeholders. SW024 was not sampled as the stakeholder declined sampling.
Field Observations	No visual or olfactory indications of contamination were observed during the sampling of the surface water sampling locations. Field observations are presented in **Table T3** in **Appendix B**.

Compound	Criteria
Surface Water Quality Parameter Field Measurements	Surface water quality parameters were measured prior to collecting surface water samples. The readings are presented in **Table T3** in **Appendix B** and are summarised below: • Dissolved oxygen ranged from 2.72 mg/L (SW023) to 6.80 mg/L (SW017). The measurements generally indicated moderately to well oxygenated conditions. • Electrical conductivity ranged from 67.7 µS/cm (SW016) to 398 µS/cm (SW012) indicating fresh conditions in inland creeks, dams and estuarine environments. • pH ranged from 4.71 (SW007) to 6.27 (SW017). pH results generally indicated acidic conditions. • Corrected redox ranged from 308 mV (SW023) to 408 mV (SW013) indicating mildly reducing conditions. • Temperature ranged from 20.5°C (SW019) and 23.6°C (SW023).
Weather Conditions	Weather conditions during groundwater sampling were wet with heavy rainfall on four of the five days. There was a total of 157.6 mm of rainfall during this period.
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.

4.2.2 PFAS Surface Water Analytical Results

The PFAS surface water analytical results from this sampling event are presented in **Table T4** in **Appendix B**. There were no first-time detections or first-time exceedances of the human health guideline values in the May 2022 sampling event for PFOA and sum of PFHxS+PFOS. Two primary surface water samples (SW019, SW023) reported PFOS above the limit of reporting at concentrations that exceeded the HEPA (2020) ecological guideline value for 99% protection of fresh / marine water species. In addition, the triplicate surface water sample from SW027 (QC226) reported PFOS at a concentration that exceeded the ecological guideline. No surface water samples reported PFOA at concentrations that exceeded the HEPA (2020) ecological guideline value for 99% protection of fresh / marine water species.

Concentrations of PFOS and PFOA at SW025 did not exceed the HEPA (2020) ecological guideline value for 95% species protection of freshwater species.

4.3 Sediment

4.3.1 Sediment Observations

Table 13 Sediment Observations

Compound	Criteria
Access	Eighteen of the 19 sediment sampling locations were accessible during the May 2022 sampling event. Prior to conducting sampling on private properties, access permissions were obtained from stakeholders. SD024 was not sampled as the stakeholder declined sampling.
Field Observations	No visible or olfactory indications of contamination were observed during the sampling of the sediment locations. Field observations are presented in **Table T5** in **Appendix B**.
Weather Conditions	Weather conditions during groundwater sampling were wet with heavy rainfall on four of the five days. There was a total of 157.6 mm of rainfall during this period.
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.

4.3.2 Sediment Analytical Results

The PFAS sediment analytical results from this sampling event are presented in **Table T6** in **Appendix B.** None of the samples reported PFAS concentrations exceeding the limit of reporting.

4.4 Wastewater Observations, Quality Parameter Field Measurements and Analytical Results

Wastewater observations and quality parameter field measurements are presented in **Table T7**, **Appendix B**. The water was clear with no sheen or odour. The field parameters indicated the water was slightly alkaline, brackish, well oxygenated and oxidising.

The PFAS analytical results for the wastewater sample is presented in **Table T8** in **Appendix B**. One compound, PFHxS was detected at 0.01 µg/L. There were no first-time detections of PFAS or exceedances of the human health or ecological guideline values in the May 2022 sampling event.

5.0 Summary and Next Sampling Event

5.1 Summary of Monitoring Event

A biannual groundwater, surface water and wastewater monitoring event was completed at the WBTA Management Area between 09 and 13 May 2022. The event included sampling of groundwater from 22 monitoring wells, two extraction bores, one wastewater sample from the WWTP and 18 surface water / sediment sampling locations. **Table 14** summarises the findings of the biannual May 2022 sampling event and the recommended actions.

Table 14 Summary of Sampling Event

Item	Comment	Recommended Actions
Access to sampling locations	All 22 monitoring wells, two extraction bores and 18 surface water / sediment sampling locations were accessible and able to be sampled. One surface water / sediment sampling location could not be sampled as the stakeholder declined access. The WWTP outlet was able to be sampled.	None.
Monitoring well network condition	No issues were identified in the 22 monitoring wells sampled.	None.
Analytical results	PFAS concentrations in all groundwater, surface and wastewater samples were consistent with historical results. Sum of PFHxS and PFOS concentrations exceeded the HEPA (2020) drinking water guidelines value in three groundwater samples. PFOS concentrations exceeded the HEPA (2020) ecological guideline value (99% species protection) in four groundwater and three surface water samples.	Ongoing monitoring in accordance with the OMP.
First-time detections of sum of PFHxS+PFOS or PFOA	There were one first-time detection of sum of PFHxS+PFOS in groundwater sample MW109. The concentration detected was close to the limit of reporting. There were no first-time detections of sum of PFHxS+PFOS or PFOA in the other 23 groundwater samples, the 18 surface water samples, 18 sediment samples or the wastewater sample.	Ongoing monitoring in accordance with the OMP.
First time exceedance of HEPA (2020) drinking water or recreational use guidelines	There was one first-time exceedance of the HEPA (2020) drinking water guidelines. This was in the off-site sample, MW118. There were no first-time exceedances of the NHMRC (2019) recreational use guidelines.	Ongoing monitoring in accordance with the OMP. The next monitoring event will verify if PFAS concentrations in groundwater at MW118 continue to exceed the drinking water guideline value.

5.2 Upcoming Sampling Events

The next biannual sampling event is scheduled for October/November 2022.

5.3 Upcoming Annual Interpretive Report

The next annual interpretative report is scheduled for January 2023.

6.0 References

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Appendix A

Figures

Appendix A Figures

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LOCATION OF WBTA AND MANAGEMENT AREA

May 2022 Sampling Event Wide Bay Training Area, Queensland

FIGURE 1

Pioneer Point Boat Ramp
Tin Can Bay
Inskip
Pannikin Island
UOTF/EHTA
Demolition Range
SW012
Old Boat Ramp/Sentry Post
Little Sandy Creek
Airstrip UAV
24m Tower
Wide Bay Training Area
SW005
SW008
Mosquito Creek
Tookar Creek
Griffin Creek
Forward Operating Base
SW009
Carlo Island
AGR/SGR/DFSW
SW004
Kauri Creek
Kingfisher Creek
Easy Feature/MUFP/MCR/BIF
Tin Can Bay
Tin Can Inlet
Snapper Point
Smooger Point
Quarry
Tin Can Bay Waste Transfer Station and Sewage Treatment Works
MW110
MW109
SW013
SW014
Ammunition Storage
Maryborough - Cooloola Road
CASUARINA PARK
TIN CAN BAY STATE SCHOOL
TOOLARA GOLF COURSE
Toolara
Range/ECR
SW07
MW104
MW107
MW105
TOOLARA AIRPORT
MW108
SW06
MW103
Landfill 1
SW016
Tin Can Bay Road
Teewah Point
North Cooloola Point
MW111
MW106
Area shown in Figure 3
Wallu Heights
Rainbow Beach Road
Snapper Creek
Wallu
Tramway Creek
Cooloola Cove
South Cooloola Point
Poverty Point

KEY

- Wide Bay Training Area
- Management Area
- Great Sandy Strait Ramsar
- Parks and recreation reserves
- Major road
- Road
- Watercourse
- Surface water sample location
- Groundwater monitoring well location

0 2km

G:\ENV\GIS\Projects\605\60580555 Wide Bay Training Area\FIGURES\60580555 F5 Sample Locations (Greater WBTA) 08 01 2020 TO Rev B

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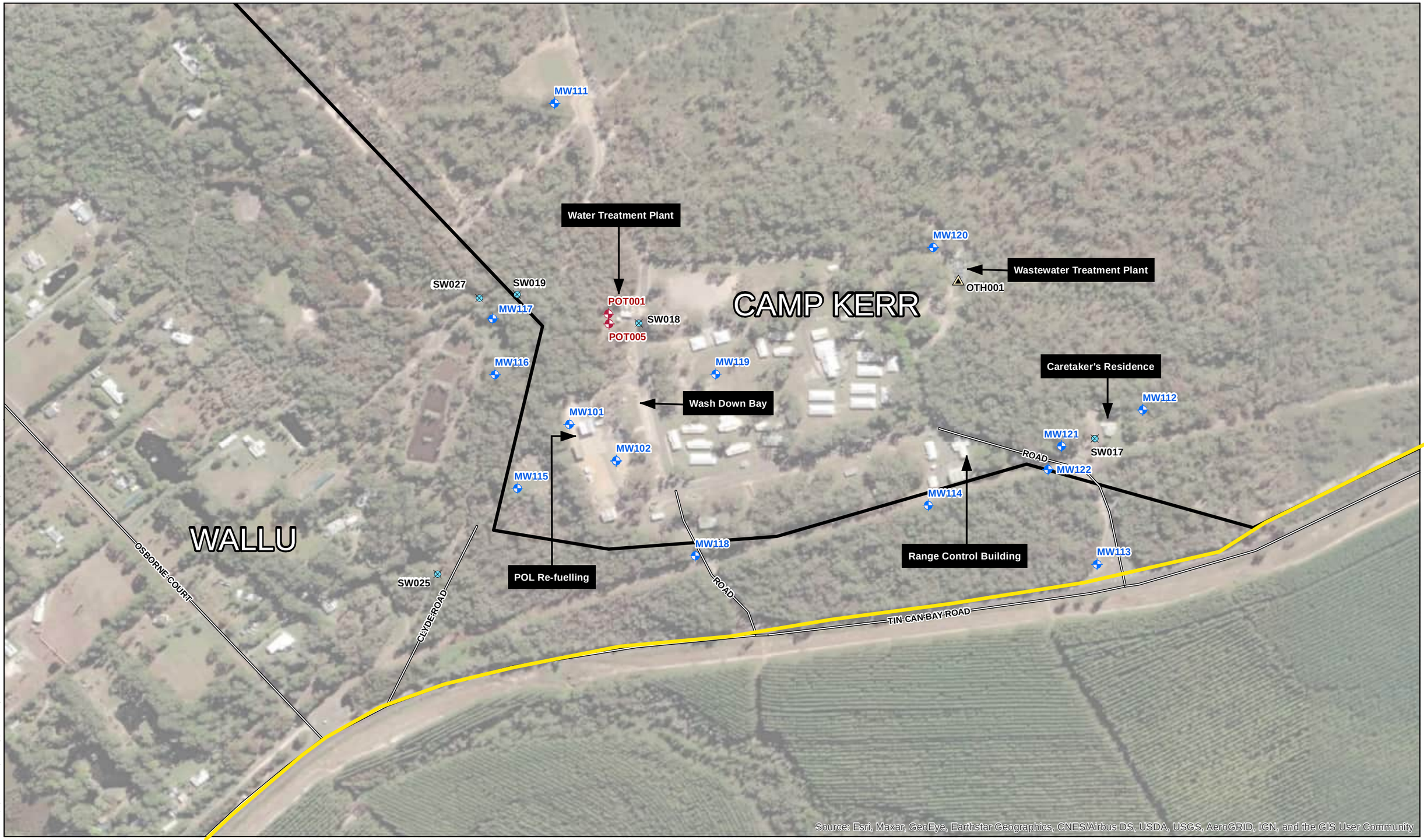
UOTF – Urban Operations Training Facility
AGR – Assault Grenade Range
SGR – Standard Grenade Range
MUFP - Multi User Firing point
MCR – Multi Classification Range
ECR – Electronic Classification Range
BIF – Battle Inoculation Facility

SAMPLING LOCATIONS (GREATER WIDE BAY TRAINING AREA)

May 2022 Sampling Event
Wide Bay Training Area, Queensland

FIGURE 2



AECOM

N

DATUM GDA 1994, PROJECTION MGA ZONE

0 50 100 200

metres

1:4,500 (when printed at A3)

LEGEND

- Waste Water Treatment Plant Sampling Location
- Abstraction Bore
- Groundwater sampling location
- Surface water sampling location
- Road
- WBTA Property Boundary
- WBTA Management Area

Note that not all sampling locations are shown for privacy reasons.

Wide Bay Training Area, Queensland

SAMPLING LOCATIONS (CAMP KERR)

May 2022 Sampling Event

PROJECT ID	60612563
CREATED BY	JP
LAST MODIFIED	SCS-06/06/22
VERSION:	1

Figure

3

A3 size

N

AECOM

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0 200 400 800

metres

1:16,918 (when printed at A3)

LEGEND

- Groundwater elevation (mAHD)
- Groundwater elevation contours (mAHD)
- Inferred Groundwater Flow Direction

Data sources:

Base Data: (c) 20XX (data source) (additional data)

Wide Bay Training Area, Queensland

INFERRED GROUNDWATER CONTOURS, GREATER WBTA

09-13 May 2022

PROJECT ID	60612563
CREATED BY	JP
LAST MODIFIED	SCS- 06/06/22
VERSION:	1

Figure 4

A3 size

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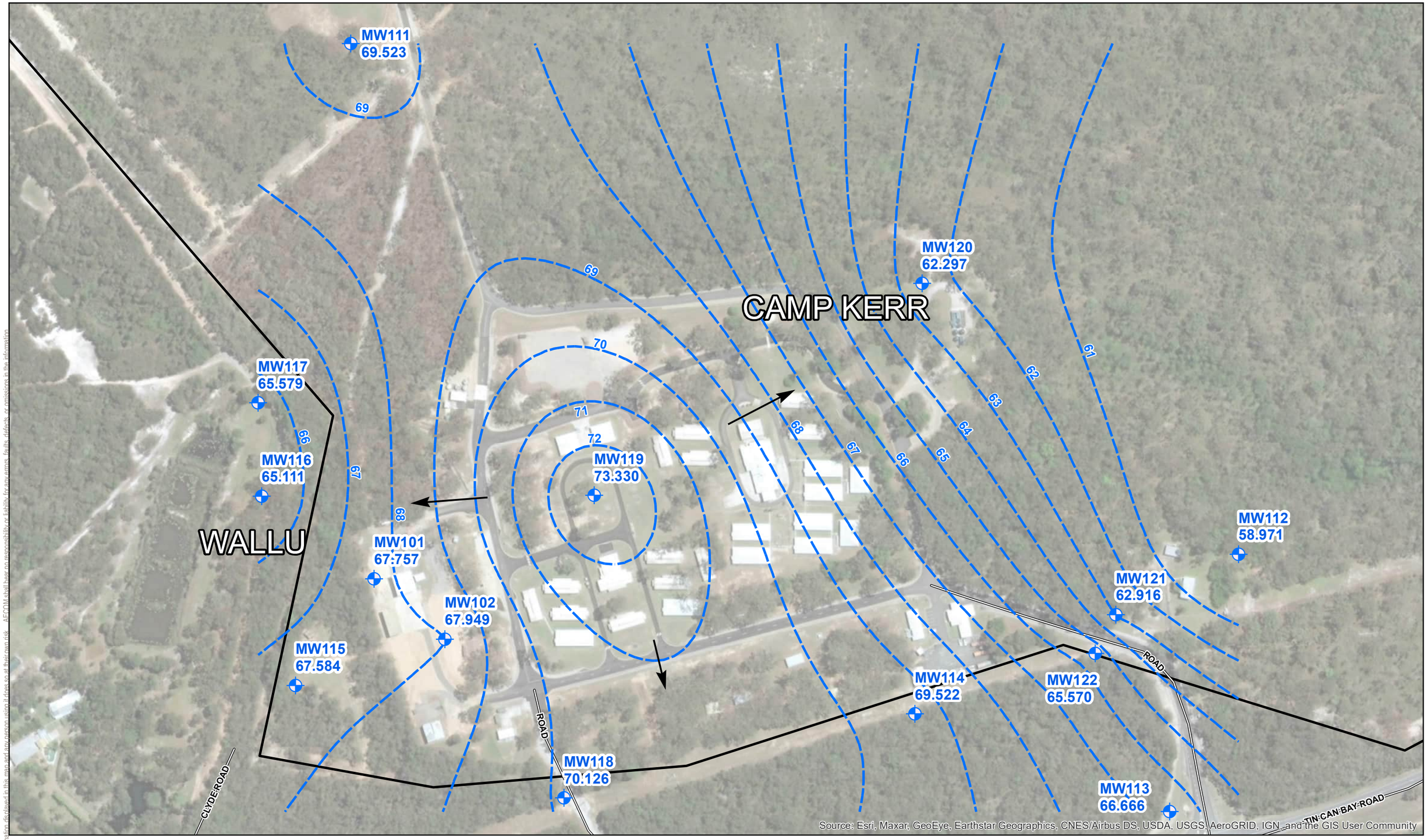

AECOM

N

DATUM GDA 1994, PROJECTION MGA ZONE XX

0 30 60 120

metres

1:2,685 (when printed at A3)

LEGEND

- Groundwater Elevation (mAHD)
- Inferred Groundwater Flow Direction
- Inferred Groundwater Contours (mAHD)
- WBTA Property Boundary

Data sources:

Base Data: (c) 20XX (data source) (additional data)

Wide Bay Training Area, Queensland

INFERRED GROUNDWATER CONTOURS (CAMP KERR)

09-13 May 2022

PROJECT ID	60612563
CREATED BY	JP
LAST MODIFIED	SCS- 06/06/22
VERSION:	1

Figure 5

A3 size

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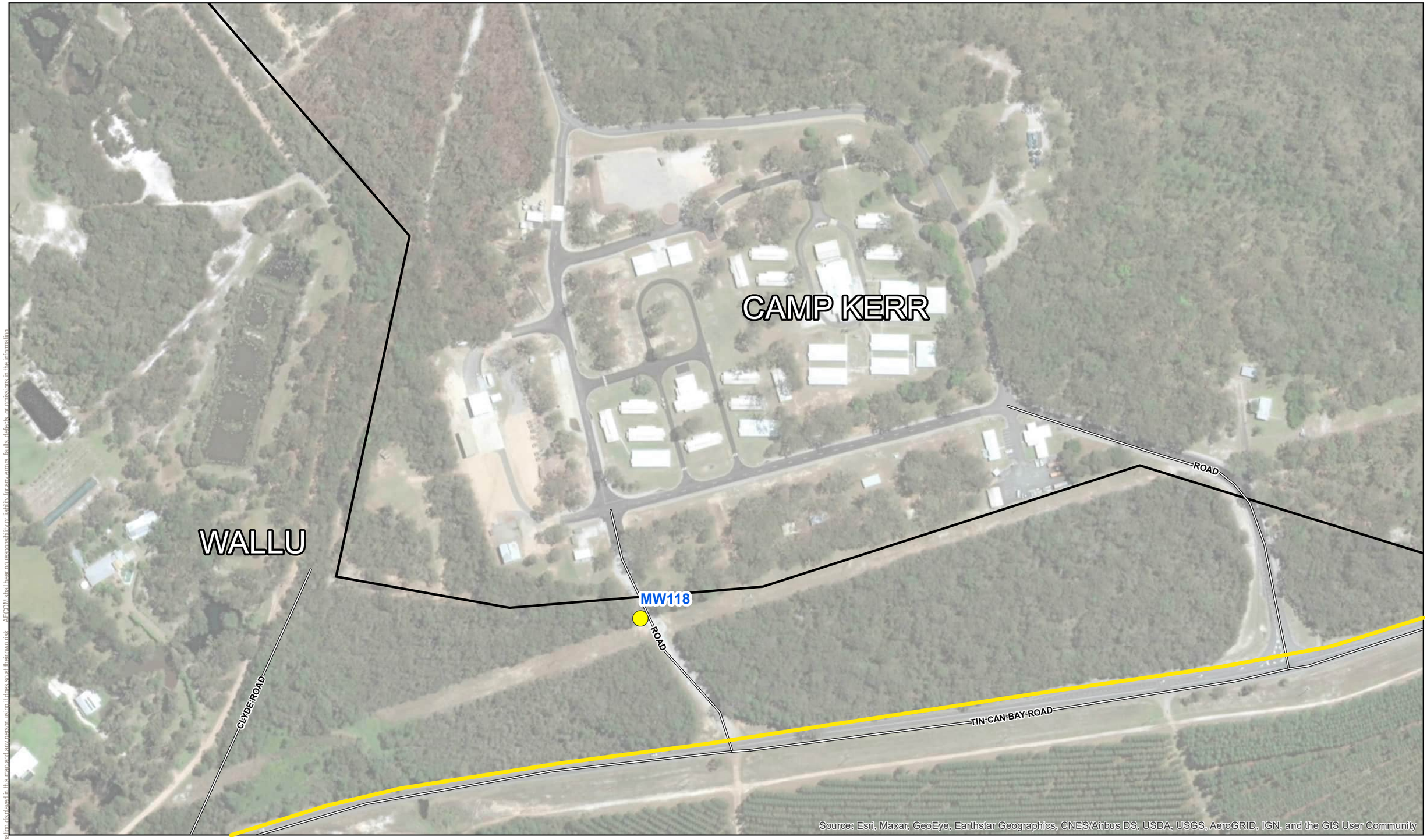

AECOM

N

DATUM GDA 1994, PROJECTION MGA ZONE XX

0 30 60 120

metres

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LEGEND

- First time exceedance of human health screening criteria for PFHxS+PFOS or PFOA
- First time detection of PFHxS+PFOS or PFOA
- WBTA Property Boundary
- Management Area

Data sources:

Base Data: (c) 20XX (data source) (additional data)

Wide Bay Training Area, Queensland

Groundwater Results Deviations from Historical Data (Camp Kerr)

09-13 May 2022

PROJECT ID	60612563
CREATED BY	JP
LAST MODIFIED	SCS- 06/06/22
VERSION:	1

Figure 6

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A3 size

G:\ENV\GIS\Projects\605\60580555 Wide Bay Training Area\FIGURES\605805555\PMAP_Figure 3 Site Features 08/05/2020 JP Rev 1

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Definitions
UOTF – Urban Operations Training Facility
AGR – Assault Grenade Range
SGR – Standard Grenade Range
MUFP - Multi User Firing point
MCR – Multi Classification Range
ECR – Electronic Classification Range
BIF – Battle Inoculation Facility

First time detection of PFHxS+PFOS or PFOA
WBTA Property Boundary
Management Area

GROUNDWATER RESULTS DEVIATIONS FROM HISTORICAL DATA (GREATER WBTA)

May 2022 Sampling Event - Wide Bay Training Area, Queensland

FIGURE 7

Appendix B

Tables

Appendix B Tables

Table T1 Groundwater Gauging and Quality Parameter Field Measurement Results

Property ID	Well ID	Hydrasleeve install date	Gauging and Sample date	Hydrasleeve target depth (mbtoc)	Screened Interval depth (mbgs)	Depth to Water (mbtoc)	TOC Elevation (mAHD)	Groundwater Elevation (mAHD)	Well Depth (mbtoc)	Condition of Stand up cover / Gatic	DO (mg/L)	EC (µS/cm)	pH	E_r (mV)	E_h (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method / Comments
0224	MW101	10/11/2021	10/05/2022	15.0	11 - 15	11.507	79.264	67.757	16.08	Good	1.01	211	5.54	212	417	20.9	Medium	Clear	No odour	No sheen	Hydrasleeve
0224	MW102	09/11/2021	10/05/2022	19.5	14-20	10.615	78.564	67.949	19.91	Good	1.6	115	4.37	242	447	22	Slightly turbid	Clear	No odour	No sheen	Hydrasleeve
0224	MW103	09/11/2021	10/05/2022	10.5	7.5 - 10.5	2.081	33.239	31.158	11.6	Good	3.77	116	5.25	165	370	22.6	Medium	Clear	No odour	No sheen	Hydrasleeve
0224	MW104	09/11/2021	10/05/2022	11.0	8 - 11	3.043	20.815	17.772	12.035	Good	2.2	128	4.71	199	404	22.7	Slightly turbid	Clear	No odour	No sheen	Hydrasleeve
0224	MW105	09/11/2021	10/05/2022	7.0	4.2 - 7.2	1.748	27.603	25.855	8.35	Good	1.8	572	6.14	98	303	22.6	Medium	Clear	No odour	No sheen	Hydrasleeve
0224	MW106	09/11/2021	12/05/2022	10.0	4 - 10	2.017	69.468	67.451	11.05	Good	3.81	93.4	4.32	168	373	23.1	Medium	Clear	No odour	No sheen	Hydrasleeve
0224	MW107	09/11/2021	12/05/2022	5.8	2.8 - 5.8	1.425	37.789	36.364	6.31	Good	0.87	227	5.37	105	310	22.8	Medium	Clear	No odour	No sheen	Hydrasleeve
0224	MW108	09/11/2021	12/05/2022	17.5	14.5 - 17.5	2.822	39.99	37.168	18.475	Good	0.33	474	6.72	-88.9	116.1	23.5	Medium	Clear, grey sediment	Septic odour	No sheen	Hydrasleeve
0224	MW109	08/11/2021	10/05/2022	10.0	7 - 10	0.457	9.207	8.750	11.06	Good	0.48	209	5.48	152	357	21.8	Medium	Clear	No odour	No sheen	Hydrasleeve
0224	MW110	08/11/2021	10/05/2022	3.5	0.5 - 4	1	17.967	16.967	4.535	Good	0.97	227	4.5	214	419	22.5	Medium	Clear	No odour	No sheen	Hydrasleeve
0224	MW111	09/11/2021	12/05/2022	20.5	16.5 - 20.5	9.429	78.952	69.523	21.535	Good	0.32	221	4.95	125.6	330.6	22.9	Medium	Clear	No odour	No sheen	Hydrasleeve
0224	MW112	10/11/2021	12/05/2022	9.0	6 - 9	6.212	65.183	58.971	9.87	Good	0.29	67	4.87	150	355	22.6	Medium	Clear	No odour	No sheen	Hydrasleeve.
0224	MW113	10/11/2021	12/05/2022	8.0	6 - 9	1.051	67.717	66.666	9.015	Good	1.1	162	4.84	164	369	23	Medium	Clear	No odour	No sheen	Hydrasleeve
0224	MW114	10/11/2021	12/05/2022	11.5	8.5 - 11.5	3.494	73.016	69.522	12.52	Good	1.94	80.3	5.18	158	363	22.8	Medium	Clear	No odour	No sheen	Hydrasleeve
0224	MW115	10/11/2021	09/05/2022	16.0	13 - 16	9.075	76.659	67.584	17.065	Good	1.19	186.5	5.1	180	385	21.2	Medium	Clear	No odour	No sheen	Hydrasleeve
0224	MW116	10/11/2021	12/05/2022	11.0	8 - 11	4.704	69.815	65.111	11.795	Good	0.54	419	5.97	73	278	22.4	Medium	Clear	No odour	No sheen	Hydrasleeve
0224	MW117	10/11/2021	12/05/2022	10.0	7 - 10	3.335	68.914	65.579	11.01	Good	0.22	416	5.31	85	290	22.4	Medium	Clear	No odour	No sheen	Hydrasleeve
0224	MW118	10/11/2021	12/05/2022	12.7	10 - 13	6.028	76.154	70.126	13.59	Good	2.37	100	4.54	168	373	22.2	Medium	Clear	No odour	No sheen	Hydrasleeve.
0224	MW119	10/11/2021	09/05/2022	14.7	13 - 16	6.216	79.546	73.330	15.76	Good	2.4	227	4.6	211	416	20.9	Medium	Clear	No odour	No sheen	Hydrasleeve
0224	MW120	09/05/2022	10/05/2022	12.7	Unknown	9.035	71.332	62.297	14.5	Good	0.38	122	4.72	212.7	417.7	21.6	Clear	Clear	No odour	No sheen	Hydrasleeve
0224	MW121	09/05/2022	11/05/2022	14.0	Unknown	7.489	70.405	62.916	14.4	Good	0.8	181	4.53	156	361	22	Clear	Clear	No odour	No sheen	Hydrasleeve
0224	MW122	09/05/2022	10/05/2022	19.0	Unknown	5.005	70.575	65.570	19.4	Good	1.6	115	4.39	272	477	22	Clear	Clear	No odour	No sheen	Hydrasleeve
0224	POT001	-	09/05/2022	-	18 - 78.4	-	-	-	-	-	2.8	453	6.8	148	353	19.5	Clear	Clear	No odour	No sheen	Tap
0224	POT005	-	09/05/2022	-	30 - 51.5	-	-	-	-	-	2.5	484	6.7	151	356	21	Clear	Clear	No odour	No sheen	Tap

Notes

mbgs is metres below ground surface

9/05/2022

mbtoc is metres below top of casing

mAHD is metres above Australian height datum

DO is dissolved oxygen

EC is electrical conductivity

E_h is oxidation reduction potential

Oxidation reducation potential (E_r) measured with a platinum electrode and a silver/silver chloride reference electrode (E_r) and converted to E_h by $E_h = E_r + 205$ mV (based on a groundwater temperature of 21°C)

Temp is Temperature

µS/cm is microsiemens per centrimetre

ºC is degrees Celcius

mV is millivolts

˙ - No data

Table T2 Groundwater PFAS Analytical Results

		PFHxS and PFOS	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTeDA	PFTrDA	FOSA	MeFOSE	EtFOSE	MeFOSA	EtFOSA	MFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Sum of PFAS
	Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.05	0.05	0.05	0.05	0.02	0.02	0.05	0.05	0.05	0.05	0.01
NEMP (HEPA, 2020) Human Health Drinking Water		**0.07**											**0.56**																		
NHMRC (2019) PFAS Recreational Water		2											10																		
NEMP (HEPA, 2020) Ecological Freshwater 99% Species Protection							*0.00023*						*19*																		

Location ID	Sample ID	Sample Date		Lab Report No.																												
MW101	0224_MW101_220510	10/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW102	0224_MW102_220510	10/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW103	0224_MW103_220510	10/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW104	0224_MW104_220510	10/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW105	0224_MW105_220510	10/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW106	0224_MW106_220512	12/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW107	0224_MW107_220512	12/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW108	0224_MW108_220512	12/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW109	0224_MW109_220510	10/05/2022	Normal	EB2213545	0.02	<0.02	<0.02	<0.01	<0.02	*0.02*	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.02
MW110	0224_MW110_220510	10/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW111	0224_MW111_220512	12/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW112	0224_MW112_220512	12/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW113	0224_MW113_220512	12/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW114	0224_MW114_220512	12/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW115	0224_MW115_220509	9/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW116	0224_MW116_220512	12/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW117	0224_MW117_220512	12/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW118	0224_MW118_220512	12/05/2022	Normal	EB2213545	**0.09**	<0.02	<0.02	0.06	<0.02	*0.03*	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.09
MW118	0224_QC129_220512	12/05/2022	Duplicate	EB2213545	**0.07**	<0.02	<0.02	0.05	<0.02	*0.02*	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.07
MW118	0224_QC229_220512	12/05/2022	Triplicate	AECO06_220517	0.038	<0.01	<0.01	0.038	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.038
MW119	0224_MW119_220509	9/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW120	0224_MW120_220510	10/05/2022	Normal	EB2213545	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW121	0224_MW121_220511	11/05/2022	Normal	EB2213545	**0.08**	<0.02	<0.02	0.06	<0.02	*0.02*	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.08
MW121	0224_QC123_220511	11/05/2022	Duplicate	EB2213545	**0.08**	<0.02	<0.02	0.06	<0.02	*0.02*	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.08
MW121	0224_QC223_220511	11/05/2022	Triplicate	AECO06_220517	0.044	<0.01	<0.01	0.044	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.044
MW122	0224_MW122_220510	10/05/2022	Normal	EB2213545	**0.2**	<0.02	<0.02	0.16	<0.02	*0.04*	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.2
MW122	0224_QC124_220510	10/05/2022	Duplicate	EB2213545	**0.17**	<0.02	<0.02	0.13	<0.02	*0.04*	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.17
MW122	0224_QC224_220510	10/05/2022	Triplicate	AECO06_220517	**0.133**	<0.01	0.011	0.11	<0.01	*0.023*	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.144
POT001	0224_POT001_220509	9/05/2022	Normal	EB2213545	0.03	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.03
POT005	0224_POT005_220509	9/05/2022	Normal	EB2213545	0.02	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.02

LOR is limit of reporting
µg/L is micrograms per litre
-' denotes no analysis undertaken
<' denotes concentration is less than
NEMP is National Environmental Mangement Plan
Denotes first time detection above LOR
Denotes new exceedance of human health guideline values

Table T3 Surface Water Quality Parameter Field Measurement Results

Property ID	Location ID	Sample Date	DO (mg/L)	EC (µS/cm)	pH	E_r (mV)	E_h (mV)	Temp (°C)	Turbidity	Odour	Sheen
0224	SW004	11/05/2022	5.07	136	5.08	168	373	21.4	Clear	No odour	No sheen
0224	SW005	11/05/2022	4.39	114	4.98	162	367	21.5	Slightly turbid	No odour	No sheen
0224	SW006	12/05/2022	3.16	87	5.29	144	349	22.3	Slightly turbid	No odour	No sheen
0224	SW007	10/05/2022	3.78	106	4.71	196	401	21.4	Medium	No odour	No sheen
0224	SW008	11/05/2022	4.57	166	5.06	143	348	21.4	Clear	No odour	No sheen
0224	SW009	11/05/2022	5.15	88.3	5.27	148	353	23.1	Turbid	No odour	No sheen
0224	SW012	11/05/2022	4.63	398	5.34	136	341	21.2	Clear	No odour	No sheen
0224	SW013	10/05/2022	5.78	109	4.8	203	408	21.6	Medium	No odour	No sheen
0224	SW014	10/05/2022	3.90	123	4.9	194	399	21	Clear	No odour	No sheen
0224	SW016	12/05/2022	4.80	67.7	5.18	144	349	21.7	Medium	No odour	No sheen
0224	SW017	9/05/2022	6.80	107	6.27	165	370	20.9	Slightly turbid	No odour	No sheen
0224	SW018	9/05/2022	6.00	78	6.1	163	368	21.3	Clear	No odour	No sheen
0224	SW019	9/05/2022	5.81	143	5.35	173	378	20.5	Grey, silty	No odour	No sheen
0224	SW021	13/05/2022	2.50	107	5.13	119	324	21.7	Clear	No odour	No sheen
0224	SW022	12/05/2022	3.86	72	5.24	163	368	23.5	Clear	No odour	No sheen
0224	SW023	12/05/2022	2.72	106	5.72	103	308	23.6	Clear	No odour	No sheen
0224	SW024	Not sampled- stakeholder declined access.									
0224	SW025	12/05/2022	3.09	94	5.29	134	339	21.6	Brown	No odour	No sheen
0224	SW027	11/05/2022	3.23	107	5.97	116	321	21	Turbid	No odour	No sheen

Notes

DO is dissolved oxygen

EC is electrical conductivity

E_h is oxidation reduction potential

Oxidation reducation potential (E_r) measured with a platinum electrode and a silver/silver chloride reference electrode (E_r) and converted to E_h by $E_h = E_r + 205$ mV (based on a groundwater temperature of 21°C)

Temp is Temperature

µS/cm is microsiemens per centrimetre

ºC is degrees Celcius

mV is millivolts

` - No data

Table T4 Surface Water PFAS Analytical Results

		PFHxS and PFOS	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTeDA	PFTrDA	FOSA	MeFOSE	EtFOSE	MeFOSA	EtFOSA	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Sum of PFAS
	Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	0.0016	0.0005	0.0005	0.0005	0.0005	0.0003	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.001	0.001	0.001	0.0005	0.0005	0.001	0.001	0.001	0.001	0.0016
NHMRC (2019) PFAS Recreational Water		2											10																		
HEPA (2020) Ecological Freshwater 99% Species Protection							**0.00023**						**19**																		
HEPA (2020)Ecological Freshwater 95% Species Protection (SW025 only)							*0.13*						*220*																		

Location ID	Sample ID	Sample Date	Type	Lab Report No.																												
SW004	0224_SW004_220511	11/05/2022	Normal	EB2213573	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0157	<0.0393	<0.0157	<0.0016	<0.039	<0.039	<0.039	<0.039	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0157
SW005	0224_SW005_220511	11/05/2022	Normal	EB2213573	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0081	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0162	<0.0404	<0.0162	<0.0016	<0.04	<0.04	<0.04	<0.04	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0162
SW006	0224_SW006_220512	13/05/2022	Normal	EB2213573	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0082	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.041	<0.0016	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0164
SW006	0224_QC128_220512	12/05/2022	Duplicate	EB2213573	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0082	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0412	<0.0016	<0.0016	<0.004	<0.004	<0.041	<0.041	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0165
SW006	0224_QC228_220512	12/05/2022	Triplicate	AECO06_220517	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.005	0.014	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.001	<0.005	<0.005	<0.01	<0.01	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	0.014
SW007	0224_SW007_220510	10/05/2022	Normal	EB2213573	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0394	<0.0016	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0158
SW008	0224_SW008_220511	11/05/2022	Normal	EB2213573	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0397	<0.0016	<0.0016	<0.004	<0.04	<0.04	<0.04	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0159
SW009	0224_SW009_220511	11/05/2022	Normal	EB2213573	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0395	<0.0016	<0.0016	<0.004	<0.004	<0.004	<0.004	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0158
SW012	0224_SW012_220511	11/05/2022	Normal	EB2213573	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0079	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0397	<0.0016	<0.0016	<0.004	<0.04	<0.04	<0.04	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0159
SW013	0224_SW013_220510	10/05/2022	Normal	EB2213573	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0012	<0.0008	<0.0041	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0082	<0.0205	<0.0082	<0.0008	<0.02	<0.02	<0.02	<0.02	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.0082
SW014	0224_SW014_220510	10/05/2022	Normal	EB2213573	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0018	<0.0016	<0.0081	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0162	<0.0404	<0.0162	<0.0016	<0.004	<0.04	<0.04	<0.04	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0162
SW014	0224_QC122_220510	10/05/2022	Duplicate	EB2213573	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0012	<0.0008	<0.004	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.008	<0.02	<0.008	<0.0008	<0.02	<0.02	<0.02	<0.02	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.008
SW014	0224_QC222_220510	10/05/2022	Triplicate	AECO06_220517	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.005	0.018	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.001	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	0.018
SW016	0224_SW016_220512	13/05/2022	Normal	EB2213573	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0081	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0163	<0.0407	<0.0163	<0.0016	<0.004	<0.041	<0.041	<0.041	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0163
SW017	0224_SW017_220509	9/05/2022	Normal	EB2213573	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0003	<0.0005	<0.002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0032	<0.008	<0.0032	<0.0005	<0.008	<0.008	<0.008	<0.008	<0.0005	<0.0005	<0.001	<0.001	<0.001	<0.001	<0.0032
SW018	0224_SW018_220509	9/05/2022	Normal	EB2213573	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0022	<0.0008	<0.004	<0.0035	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.002	<0.0008	<0.0008	<0.0008	<0.002	<0.002	<0.002	<0.002	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.0008
SW019	0224_SW019_220509	9/05/2022	Normal	EB2213573	0.0354	<0.003	<0.002	0.0197	<0.0016	**0.0157**	<0.0016	<0.008	<0.0016	<0.003	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.016	<0.04	<0.016	<0.0016	<0.04	<0.04	<0.04	<0.04	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	0.0354
SW021	0224_SW021_220513	13/05/2022	Normal	EB2213615	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.004	<0.0008	<0.004	<0.0015	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.02	<0.0008	<0.0008	<0.002	<0.002	<0.02	<0.02	<0.008	<0.008	<0.001	<0.001	<0.001	<0.001	<0.0008
SW022	0224_SW022_220512	12/05/2022	Normal	EB2213618	<0.0008	<0.0008	<0.0008	<0.0015	<0.0008	<0.0012	<0.0008	<0.004	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.02	<0.0008	<0.0008	<0.02	<0.02	<0.02	<0.02	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	<0.008
SW023	0224_SW023_220512	12/05/2022	Normal	EB2213618	0.0117	<0.0008	<0.0008	0.0074	<0.0008	**0.0043**	<0.0008	<0.006	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.02	<0.0008	<0.0008	<0.02	<0.02	<0.02	<0.02	<0.0008	<0.0008	<0.001	<0.001	<0.001	<0.001	0.0117
SW025	0224_SW025_220512	13/05/2022	Normal	EB2213573	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0026	<0.0016	<0.0081	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0016	<0.0163	<0.0163	<0.0406	<0.0163	<0.0016	<0.041	<0.041	<0.041	<0.0016	<0.0016	<0.002	<0.002	<0.002	<0.002	<0.0163
SW027	0224_SW027_220511	11/05/2022	Normal	EB2213573	<0.003	<0.003	<0.003	<0.004	<0.003	<0.0112	<0.003	<0.0151	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.0076	<0.003	<0.003	<0.008	<0.008	<0.008	<0.008	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
SW027	0224_QC126_220511	11/05/2022	Duplicate	EB2213573	<0.0031	<0.0031	<0.0031	<0.0035	<0.0031	<0.01	<0.0031	<0.0153	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0031	<0.0076	<0.0031	<0.0031	<0.008	<0.008	<0.008	<0.008	<0.0031	<0.0031	<0.003	<0.003	<0.003	<0.003	<0.0031
SW027	0224_QC226_220511	11/05/2022	Triplicate	AECO06_220517	0.0086	<0.001	<0.001	0.0039	<0.001	**0.0047**	<0.001	<0.005	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.001	<0.005	<0.005	<0.01	<0.01	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	0.0186

LOR is limit of reporting
µg/L is micrograms per litre
-' denotes no analysis undertaken
<' denotes concentration is less than
Denotes first time detection above LOR
Denotes new exceedance of human health guideline values
In accordance with the SAQP, SW025 has been assessed with HEPA (2020) ecological guideline for the protection of freshwater species at 95%.

Table T5 Sediment Sample Field Observations

Property ID	Location ID	Sample Date	Sample Description	Odour
0224	SD004	11/05/2022	SAND, grey brown with gravels, roots and organic matter.	No odour
0224	SD005	11/05/2022	SAND, grey brown with clay, gravels, roots and organic matter.	No odour
0224	SD006	12/05/2022	SAND, grey with red and orange gravels.	No odour
0224	SD007	10/05/2022	SAND, grey brown with clay.	No odour
0224	SD008	11/05/2022	clayey SAND, brown with fine gravels.	No odour
0224	SD009	11/05/2022	clayey SAND, yellow brown with minor gravels.	No odour
0224	SD012	11/05/2022	clayey SAND, light brown with red and orange mottling, gravels.	No odour
0224	SD013	10/05/2022	sandy CLAY, yellow brown.	No odour
0224	SD014	10/05/2022	clayey SAND, grey.	No odour
0224	SD016	12/05/2022	SAND, grey and red, dark brown, with organic matter.	No odour
0224	SD017	9/05/2022	SAND, brown, over black silty clay.	No odour
0224	SD018	9/05/2022	clayey CLAY, grey brown, with minor gravels.	No odour
0224	SD019	9/05/2022	sandy CLAY, brown, with some gravel and roots.	No odour
224	SD021	13/05/2022	clayey SAND, grey brown.	No odour
0224	SD022	12/05/2022	clayey SAND, red orange.	No odour
0224	SD023	12/05/2022	sandy CLAY, dark brown, with oranic matter.	No odour
0224	SD025	12/05/2022	SAND, brown with minor clay, gravel and roots.	No odour
0224	SD027	11/05/2022	sandy CLAY, dark brown, gravels and roots.	No odour

Table T6 Sediment PFAS Analytical Results

	PFHxS and PFOS	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFDoDA	PFTeDA	PFTrDA	PFUnDA	FOSA	EtFOSE	MeFOSE	EtFOSA	MeFOSA	EtFOSAA	MFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Sum of PFAS
Units	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	mg/kg
LOR	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002	0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002	0.0002	0.0005	0.0005	0.0005	0.0005	0.0002

Location ID	Sample ID	Sample Date	Type	Lab Report No.																												
SD004	0224_SD004_220511	11/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD005	0224_SD005_220511	11/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD006	0224_SD006_220512	12/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD006	0224_QC127_220512	12/05/2022	Duplicate	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD006	0224_QC227_220512	12/05/2022	Triplicate	AECO06_220517	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.001	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.002	<0.001
SD007	0224_SD007_220510	10/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD008	0224_SD008_220511	11/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD009	0224_SD009_220511	11/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD012	0224_SD012_220511	11/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD013	0224_SD013_220510	10/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD014	0224_SD014_220510	10/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD014	0224_QC121_220510	10/05/2022	Duplicate	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD014	0224_QC221_220510	10/05/2022	Triplicate	AECO06_220517	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.001	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.002	<0.001
SD016	0224_SD016_220512	12/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD017	0224_SD017_220509	9/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD018	0224_SD018_220509	9/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0003	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD019	0224_SD019_220509	9/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD021	0224_SD022_220513	13/05/2022	Normal	EB2213615	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD022	0224_SD022_220512	12/05/2022	Normal	EB2213618	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD023	0224_SD023_220512	12/05/2022	Normal	EB2213618	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0006	<0.0002	<0.0002	<0.0006	<0.0006	<0.0006	<0.0006	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD025	0224_SD025_220512	12/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD027	0224_SD027_220511	11/05/2022	Normal	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.001	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD027	0224_QC125_220511	11/05/2022	Duplicate	EB2213563	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002	<0.0002	<0.0005	<0.0005	<0.0005	<0.0005	<0.0002
SD027	0224_QC225_220511	11/05/2022	Triplicate	AECO06_220517	<0.002	<0.001	<0.001	<0.001	<0.001	<0.002	<0.001	<0.002	<0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.002	<0.001	<0.005	<0.005	<0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.001	<0.002	<0.001

LOR is limit of reporting
mg/kg is milligrams per kilogram
µg/kg is micrograms per kilogram
'-' denotes no analysis undertaken
'<' denotes concentration is less than
Denotes first time detection above LOR

Table T7 Wastewater Quality Parameter Field Measurement Results

Property ID	Well ID	Sample Date	DO (mg/L)	EC (µS/cm)	pH	E_r (mV)	E_h (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method / Comments
0224	OTH001	10/05/2022	4.63	1549	8.6	589	794	21.9	Clear	Clear	No odour	No sheen	Tap

DO is dissolved oxygen
EC is electrical conductivity
E_h is oxidation reduction potential
Oxidation reducation potential (E_r) measured with a platinum electrode and a silver/silver chloride reference electrode (E_r) and converted to E_h by $E_h = E_r + 205$ mV (based on a groundwater temperature of 21°C)
Temp is Temperature
µS/cm is microsiemens per centrimetre
ºC is degrees Celcius
mV is millivolts

Table T8 Wastewater PFAS Analytical Results

		PFHxS and PFOS	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFPeA	PFHpA	PFHxA	PFOA	PFNA	PFDA	PFTeDA	PFTrDA	PFUnDA	PFDoDA	FOSA	MeFOSE	EtFOSE	MeFOSA	EtFOSA	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Sum of PFAS
	Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.02	0.02	0.05	0.05	0.05	0.05	0.01
HEPA (2020) Ecological Freshwater 99% Species Protection							*0.00023*						*19*																		
Location ID	**Sample ID**	**Sample Date**	**Lab Report No.**																												
OTH001	0224_OTH001_220510	10/05/2022	EB2213545	0.01	<0.02	<0.02	0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.01

LOR is limit of reporting
µg/L is micrograms per litre
-' denotes no analysis undertaken
<' denotes concentration is less than
Denotes first time detection above LOR
Denotes new exceedance of human health guideline values

Appendix C

Analytical Data Validation

Appendix C Analytical Data Validation

DATA VALIDATION REPORT

Project No.:	60612563	**Validation by:** NK	**Date:** 07/06/2022
Client:	Department of Defence		
Site:	Wide Bay Training Area		
Matrix type:	Groundwater, surface water, sediment, waste water	**Data verified by:** JP	**Date:** 24/06/2022
No. of primary samples:	43 water, 18 sediment		
Laboratory:	ALS (Brisbane), NMI (Sydney)	**Project Manager:** JP	
Lab reference:	EB2213545; EB2213563; EB2213573; EB2213615, EB2213618; AECO06_220517 (RN1352955)		

Key Issues:	Four anomalous groundwater results reported by ALS were investigated. ALS identified there was a preparation error in the initial extraction and reanalysed and reissued the results. No other QA/QC issues were identified in the field or laboratory datasets that could have a material implication on data interpretation and therefore decision-making on the project. The data are therefore considered appropriate for use to meet the project objectives.

Field QA/QC

Sampling personnel	Sampling was conducted by an AECOM environmental scientist between 09 and 13 May 2022.
Sampling Methodology	Samples were collected using appropriate methods as identified within the main body of the report.
Hydrasleeve sampling	All hydrasleeves were left in the monitoring wells for a minimum of 24 hours prior to being sampled. Installation and retrieval dates are shown in **Table T1** in **Appendix B**.
Daily Equipment Calibration	Daily equipment calibration was completed during the sampling event and are attached within **Appendix F**.
Chain of Custody (COC)	COC documents were completed as per AECOM procedures and are attached within **Appendix D**.
Rinsate Blank (refer to **Table C1**)	Rinsate blank samples were collected at a frequency of approximately one per day of sampling (five in total) where non-dedicated sampling equipment was used. All rinsates were collected from the decontaminated interface probe. Concentrations reported below the LOR for all analytes tested.
Frequency of field QC	Field duplicate (intra-laboratory duplicates) and triplicates (inter-laboratory duplicates) were collected for samples analysed for PFAS at a frequency of one in ten primary samples (six sets for 43 water samples [14%] and three sets for 18 sediment samples (17%). The frequency of field QC achieves the expected frequency for each media type. The target frequency of one in ten primary samples was achieved for all matrices.
Handling and preservation	Primary, duplicate and triplicate samples were received preserved and chilled at the laboratory. All samples were received at the laboratory in appropriate sample containers with no sample container / preservation non-compliances noted.

Laboratory QA/QC	
Tests requested/reported	Samples were analysed and reported as requested on the COC.
Holding time compliance	Samples were extracted and analysed within recommended holding times.
Laboratory Accreditation	The laboratory analysis was conducted by ALS Environmental Pty Ltd (Brisbane) a National Association of Testing Authorities (NATA) accredited laboratory. The triplicate samples were analysed at the National Measurement Institute (Sydney), also a NATA accredited laboratory.
Frequency of laboratory QC	The laboratory reported a sufficient frequency of quality control samples to assess whether the results have been reported to an acceptable accuracy and precision, except: • Laboratory duplicates for PFAS (0.00%) below the expected rate of 10.00% in: - EB2213545 (33 samples in batch) - EB2213615 (2 samples in batch) - EB2213618 (4 samples in batch). - EB2213573 (18 samples in batch) • Matrix spikes for PFAS (0.00%) below the expected rate of 5.00% in: - EB2213545 (33 samples in batch) - EB2213618 (4 samples in batch) - EB2213573 (18 samples in batch) The reason for insufficient matrix spikes and laboratory duplicates for these batches is due to the way the laboratory assigns the duplicates and matrix spikes and the availability of additional bottles. The laboratory LIMS assigns laboratory QC to samples in the analytical run; however, the runs may not allocate samples to allow for frequency compliance. However, as all other laboratory QC results met control limits this is not expected to impact data quality.
Method Blank	No method blank non-conformances were reported in the batches.
Laboratory duplicate RPDs	Laboratory duplicate relative percentage differences (RPD) were within control limits for all samples.
Laboratory control spike recovery	No non-compliances were reported for Laboratory Control Spikes (LCS).
Matrix spike recovery	All matrix spike recoveries were within control limits.
Surrogate spike recovery	Surrogate spike recoveries were within control limits.
QA/QC Data Evaluation	
Comparison of Field Observations and Laboratory Results	No anomalous results between field observations and analysis results were noted.
Data transcription	A random 10% check of the laboratory results identified no anomalies within the electronic data, the laboratory reports, and tables generated by AECOM.
Limits of reporting	LORs were sufficiently low to enable assessment against adopted screening levels except for PFOS for HEPA (2020) ecological guideline values for the 99% protection of freshwater species. The potential exists for concentrations of PFOS to be above the adopted guideline, but below the laboratory LOR. This should be taken into consideration when interpreting and using this data quantitatively where results are reported below LOR.

Field duplicate RPDs (refer to **Tables C2, C3** and **C4**)	Field duplicate RPDs were reported within control limits for all primary and duplicate samples.
Field triplicate RPDs (refer to **Tables C2, C3** and **C4**)	Field triplicate RPDs were reported within control limits for all primary and triplicate samples except for the following sample: The highest concentration is indicated in bold: 0224_SW014_220510 and **0224_QC222_220510** for PFPeA (167%). The reason for the difference is likely to be different extraction techniques between the primary and secondary laboratories.
Other	
Other observations	Monitoring well MW109 is located within 50m of a tributary of Snapper Creek that is likely to be tidally influenced. Due to this proximity, MW109 has the potential to have some tidal variations in groundwater levels. However, due to the large distance covered by the monitoring network (>8 km) between Wallu and the Base eastern boundary, the presence of minor fluctuations in groundwater level in MW109 due to tidal influence (if present) would have a minimal impact on the groundwater contour interpretation due to the large change in piezometric surface, which falls from 73.33 mAHD in Camp Kerr to 8.75 mAHD at MW109. Following review of the laboratory reports, possible anomalous results were identified for EB2213545 samples -026 to -029. ALS undertook an investigation and identified a preparation error in the initial extraction of the samples. Re-extraction and analysis of samples -026 to -029 was completed and the report reissued. A first-time exceedance of the drinking water guideline for sum of PFHxS+PFOS was reported for MW118 (0.09 µg/L). Duplicate and triplicate samples were also analysed for this location with lower concentrations reported. The triplicate sample was analysed at NMI and reported a concentration (0.038 µg/L) that did not exceed the drinking water guideline. Laboratory reports EB2213563, EB2213573, EB2213615 and EB2213618 reported raised limits of reporting due to matrix interferences (high sediment content) for selected analytes. For 16 of the 18 surface water samples analysed, the limit of reporting was raised for PFOS to a concentration higher than the ecological guideline level for 99% species protection. For these samples, it was not possible to assess if the PFOS ecological guideline level was exceeded.

Table C1
Rinsate Analytical Results

		Lab Report Number	EB2213545	EB2213545	EB2213545	EB2213545	EB2213545
		Field ID	0224_QC313_220509	0224_QC314_220510	0224_QC315_220511	0224_QC316_220512	0224_QC317_220513
		Sampled_Date	9/05/2022	10/05/2022	11/05/2022	12/05/2022	13/05/2022
		Sample Type	Rinsate	Rinsate	Rinsate	Rinsate	Rinsate
Analyte	**Units**	**EQL**					
10:2 FTS	µg/L	0.001	<0.05	<0.05	<0.05	<0.05	<0.05
4:2 FTS	µg/L	0.001	<0.05	<0.05	<0.05	<0.05	<0.05
6:2 FTS	µg/L	0.001	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 FTS	µg/L	0.001	<0.05	<0.05	<0.05	<0.05	<0.05
EtFOSA	µg/L	0.001	<0.05	<0.05	<0.05	<0.05	<0.05
EtFOSAA	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
EtFOSE	µg/L	0.001	<0.05	<0.05	<0.05	<0.05	<0.05
MeFOSA	µg/L	0.001	<0.05	<0.05	<0.05	<0.05	<0.05
MFOSAA	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
MeFOSE	µg/L	0.001	<0.05	<0.05	<0.05	<0.05	<0.05
PFBS	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
PFBA	µg/L	0.002	<0.1	<0.1	<0.1	<0.1	<0.1
PFDS	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
PFDA	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
PFDoDA	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
PFHpS	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
PFHpA	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
PFHxA	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
PFNA	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
FOSA	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
PFPeS	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
PFPeA	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
PFTeDA	µg/L	0.0005	<0.05	<0.05	<0.05	<0.05	<0.05
PFTrDA	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
PFUnDA	µg/L	0.0005	<0.02	<0.02	<0.02	<0.02	<0.02
PFOS	µg/L	0.0002	<0.01	<0.01	<0.01	<0.01	<0.01
PFOA	µg/L	0.0005	<0.01	<0.01	<0.01	<0.01	<0.01
PFHxS	µg/L	0.0005	<0.01	<0.01	<0.01	<0.01	<0.01

Table C2 Groundwater Duplicate and Triplicate Analytical Results

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		Lab Report Number	EB2213545	EB2213545		EB2213545	RN1352955		EB2213545	EB2213545		EB2213545	RN1352955		EB2213545	EB2213545		EB2213545	RN1352955	
		Field ID	0224_MW121_220511	0224_QC123_220511	RPD	0224_MW121_220511	0224_QC223_220511	RPD	0224_MW122_220510	0224_QC124_220510	RPD	0224_MW122_220510	0224_QC224_220510	RPD	0224_MW118_220512	0224_QC129_220512	RPD	0224_MW118_220512	0224_QC229_220512	RPD
		Sampled Date	11/05/2022	11/05/2022		11/05/2022	11/05/2022		10/05/2022	10/05/2022		10/05/2022	10/05/2022		12/05/2022	12/05/2022		12/05/2022	12/05/2022	
Chemical	**Units**	**EQL**																		
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	<0.05	<0.05	0	<0.05	<0.01	0
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	<0.05	<0.05	0	<0.05	<0.01	0
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	<0.05	<0.05	0	<0.05	<0.01	0
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	<0.05	<0.05	0	<0.05	<0.01	0
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	<0.05	<0.05	0	<0.05	<0.02	0
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	<0.02	<0.02	0	<0.02	<0.01	0
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	<0.05	<0.05	0
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	<0.05	<0.05	0	<0.05	<0.02	0
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	<0.02	<0.02	0	<0.02	<0.01	0
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	<0.05	<0.05	0
PFBS	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	<0.02	<0.02	0	<0.02	<0.01	0
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	<0.1	<0.1	0	<0.1	<0.05	0
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	<0.02	<0.02	0	<0.02	<0.01	0
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	<0.02	<0.02	0	<0.02	<0.01	0
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	<0.02	<0.02	0	<0.02	<0.01	0
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	<0.02	<0.02	0	<0.02	<0.01	0
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	<0.02	<0.02	0	<0.02	<0.01	0
PFHxA	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	<0.02	<0.02	0	<0.02	<0.01	0
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	<0.02	<0.02	0	<0.02	<0.01	0
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	<0.02	<0.02	0	<0.02	<0.01	0
PFPeS	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	<0.02	<0.02	0	<0.02	<0.01	0
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	<0.02	<0.02	0	<0.02	<0.02	0
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	<0.05	<0.05	0	<0.05	<0.02	0
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	<0.02	<0.02	0
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	<0.02	<0.02	0	<0.02	<0.01	0
PFOS	µg/L	0.01 : 0.02 (Interlab)	0.02	0.02	0	0.02	<0.02	0	0.04	0.04	0	0.04	0.023	54	0.03	0.02	40	0.03	<0.02	40
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	<0.01	<0.01	0	<0.01	<0.01	0
PFHxS	µg/L	0.01	0.06	0.06	0	0.06	0.044	31	0.16	0.13	21	0.16	0.11	37	0.06	0.05	18	0.06	0.038	45

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

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: no limit (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

Table C3 Surface Water Duplicate and Triplicate Analytical Results

AECOM Imagine it. Delivered.

		Lab Report Number	EB2213573	EB2213573		EB2213573	RN1352955		EB2213573	EB2213573		EB2213573	RN1352955		EB2213573	EB2213573		EB2213573	RN1352955	
		Field ID	0224_SW014_220510	0224_QC122_220510	RPD	0224_SW014_220510	0224_QC222_220510	RPD	0224_SW027_220511	0224_QC126_220511	RPD	0224_SW027_220511	0224_QC226_220511	RPD	0224_SW006_220512	0224_QC128_220512	RPD	0224_SW006_220512	0224_QC228_220512	RPD
		Sampled Date	10/05/2022	10/05/2022		10/05/2022	10/05/2022		11/05/2022	11/05/2022		11/05/2022	11/05/2022		13/05/2022	13/05/2022		13/05/2022	13/05/2022	
Chemical	**Units**	**EQL**																		
10:2 FTS	µg/L	0.05 : 0.01 (Interlab)	<0.002	<0.001	0	<0.002	<0.001	0	<0.003	<0.003	0	<0.003	<0.001	0	<0.002	<0.002	0	<0.002	<0.001	0
4:2 FTS	µg/L	0.05 : 0.01 (Interlab)	<0.002	<0.001	0	<0.002	<0.001	0	<0.003	<0.003	0	<0.003	<0.001	0	<0.002	<0.002	0	<0.002	<0.001	0
6:2 FTS	µg/L	0.05 : 0.01 (Interlab)	<0.002	<0.001	0	<0.002	<0.001	0	<0.003	<0.003	0	<0.003	<0.001	0	<0.002	<0.002	0	<0.002	<0.001	0
8:2 FTS	µg/L	0.05 : 0.01 (Interlab)	<0.002	<0.001	0	<0.002	<0.001	0	<0.003	<0.003	0	<0.003	<0.001	0	<0.002	<0.002	0	<0.002	<0.001	0
EtFOSA	µg/L	0.05 : 0.02 (Interlab)	<0.04	<0.02	0	<0.04	<0.002	0	<0.008	<0.008	0	<0.008	<0.01	0	<0.004	<0.041	0	<0.004	<0.01	0
EtFOSAA	µg/L	0.02 : 0.01 (Interlab)	<0.0016	<0.0008	0	<0.0016	<0.002	0	<0.003	<0.0031	0	<0.003	<0.002	0	<0.0016	<0.0016	0	<0.0016	<0.002	0
EtFOSE	µg/L	0.05	<0.04	<0.02	0	<0.04	<0.005	0	<0.008	<0.008	0	<0.008	<0.005	0	<0.004	<0.004	0	<0.004	<0.005	0
MeFOSA	µg/L	0.05 : 0.02 (Interlab)	<0.04	<0.02	0	<0.04	<0.002	0	<0.008	<0.008	0	<0.008	<0.01	0	<0.004	<0.041	0	<0.004	<0.01	0
MFOSAA	µg/L	0.02 : 0.01 (Interlab)	<0.0016	<0.0008	0	<0.0016	<0.002	0	<0.003	<0.0031	0	<0.003	<0.002	0	<0.0016	<0.0016	0	<0.0016	<0.002	0
MeFOSE	µg/L	0.05	<0.004	<0.02	0	<0.004	<0.005	0	<0.008	<0.008	0	<0.008	<0.005	0	<0.004	<0.004	0	<0.004	<0.005	0
PFBS	µg/L	0.02 : 0.01 (Interlab)	<0.0016	<0.0008	0	<0.0016	<0.001	0	<0.003	<0.0031	0	<0.003	<0.001	0	<0.0016	<0.0016	0	<0.0016	<0.001	0
PFBA	µg/L	0.1 : 0.05 (Interlab)	<0.0081	<0.004	0	<0.0081	<0.005	0	<0.0151	<0.0153	0	<0.0151	<0.005	0	<0.0082	<0.0082	0	<0.0082	<0.005	0
PFDS	µg/L	0.02 : 0.01 (Interlab)	<0.0016	<0.0008	0	<0.0016	<0.001	0	<0.003	<0.0031	0	<0.003	<0.001	0	<0.0016	<0.0016	0	<0.0016	<0.001	0
PFDA	µg/L	0.02 : 0.01 (Interlab)	<0.0016	<0.0008	0	<0.0016	<0.001	0	<0.003	<0.0031	0	<0.003	<0.001	0	<0.0016	<0.0016	0	<0.0016	<0.001	0
PFDoDA	µg/L	0.02 : 0.01 (Interlab)	<0.0162	<0.008	0	<0.0162	<0.001	0	<0.003	<0.0031	0	<0.003	<0.001	0	<0.0016	<0.0016	0	<0.0016	<0.001	0
PFHpS	µg/L	0.02 : 0.01 (Interlab)	<0.0016	<0.0008	0	<0.0016	<0.001	0	<0.003	<0.0031	0	<0.003	<0.001	0	<0.0016	<0.0016	0	<0.0016	<0.001	0
PFHpA	µg/L	0.02 : 0.01 (Interlab)	<0.0016	<0.0008	0	<0.0016	<0.001	0	<0.003	<0.0031	0	<0.003	<0.001	0	<0.0016	<0.0016	0	<0.0016	<0.001	0
PFHxA	µg/L	0.02 : 0.01 (Interlab)	<0.0016	<0.0008	0	<0.0016	<0.001	0	<0.003	<0.0031	0	<0.003	<0.001	0	<0.0016	<0.0016	0	<0.0016	<0.001	0
PFNA	µg/L	0.02 : 0.01 (Interlab)	<0.0016	<0.0008	0	<0.0016	<0.001	0	<0.003	<0.0031	0	<0.003	<0.001	0	<0.0016	<0.0016	0	<0.0016	<0.001	0
FOSA	µg/L	0.02 : 0.01 (Interlab)	<0.0016	<0.0008	0	<0.0016	<0.001	0	<0.003	<0.0031	0	<0.003	<0.001	0	<0.0016	<0.0016	0	<0.0016	<0.001	0
PFPeS	µg/L	0.02 : 0.01 (Interlab)	<0.0016	<0.0008	0	<0.0016	<0.001	0	<0.003	<0.0031	0	<0.003	<0.001	0	<0.0016	<0.0016	0	<0.0016	<0.001	0
PFPeA	µg/L	0.02	<0.0016	<0.0008	0	<0.0016	0.018	167	<0.003	<0.0031	0	<0.003	<0.001	0	<0.0016	<0.0016	0	<0.0016	<0.001	0
PFTeDA	µg/L	0.05 : 0.02 (Interlab)	<0.0404	<0.02	0	<0.0404	<0.002	0	<0.0076	<0.0076	0	<0.0076	<0.002	0	<0.041	<0.0412	0	<0.041	<0.002	0
PFTrDA	µg/L	0.02	<0.0162	<0.008	0	<0.0162	<0.002	0	<0.003	<0.0031	0	<0.003	<0.001	0	<0.0016	<0.0016	0	<0.0016	<0.001	0
PFUnDA	µg/L	0.02 : 0.01 (Interlab)	<0.0016	<0.0008	0	<0.0016	<0.001	0	<0.003	<0.0031	0	<0.003	<0.001	0	<0.0016	<0.0016	0	<0.0016	<0.001	0
PFOS	µg/L	0.01 : 0.02 (Interlab)	<0.0018	<0.0012	0	<0.0018	<0.002	0	<0.0112	<0.01	0	<0.0112	0.0047	0	<0.0016	<0.0016	0	<0.0016	<0.002	0
PFOA	µg/L	0.01	<0.0016	<0.0008	0	<0.0016	<0.001	0	<0.003	<0.0031	0	<0.003	<0.001	0	<0.0016	<0.0016	0	<0.0016	<0.001	0
PFHxS	µg/L	0.01	<0.0016	<0.0008	0	<0.0016	<0.001	0	<0.004	<0.0035	0	<0.004	0.0039	0	<0.0016	<0.0016	0	<0.0016	<0.001	0

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

**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

Table C4 Sediment Duplicate and Triplicate Analytical Results

AECOM Imagine it. Delivered.

Lab Report Number			EB2213563	EB2213563		EB2213563	EB2213563		EB2213563	EB2213563		EB2213563	RN1352955		EB2213563	RN1352955		EB2213563	RN1352955	
Field ID			0224_SD014_220510	0224_QC121_220510	RPD	0224_SD027_220511	0224_QC125_220511	RPD	0224_SD006_220512	0224_QC127_220512	RPD	0224_SD014_220510	0224_QC221_220510	RPD	0224_SD027_220511	0224_QC225_220511	RPD	0224_SD006_220512	0224_QC227_220512	RPD
Sampled Date			10/05/2022	10/05/2022		11/05/2022	11/05/2022		12/05/2022	12/05/2022		10/05/2022	10/05/2022		11/05/2022	11/05/2022		12/05/2022	12/05/2022	
Chemical	**Units**	**EQL**																		
10:2 FTS	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.002	0	<0.0005	<0.002	0	<0.0005	<0.002	0
4:2 FTS	mg/kg	0.0005 : 0.001 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0005	<0.001	0	<0.0005	<0.001	0
6:2 FTS	mg/kg	0.0005 : 0.001 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0005	<0.001	0	<0.0005	<0.001	0
8:2 FTS	mg/kg	0.0005 : 0.001 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.001	0	<0.0005	<0.001	0	<0.0005	<0.001	0
EtFOSA	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.002	0	<0.0005	<0.002	0	<0.0005	<0.002	0
EtFOSAA	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0	<0.0002	<0.002	0	<0.0002	<0.002	0
EtFOSE	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.005	0	<0.0005	<0.005	0
MeFOSA	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.002	0	<0.0005	<0.002	0	<0.0005	<0.002	0
MFOSAA	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0	<0.0002	<0.002	0	<0.0002	<0.002	0
MeFOSE	mg/kg	0.0005 : 0.005 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.005	0	<0.0005	<0.005	0	<0.0005	<0.005	0
PFBS	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001	0	<0.0002	<0.001	0	<0.0002	<0.001	0
PFBA	mg/kg	0.001	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.001	0	<0.001	<0.002	0	<0.001	<0.002	0	<0.001	<0.002	0
PFDS	mg/kg	0.0002	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001	0	<0.0002	<0.001	0	<0.0002	<0.001	0
PFDA	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001	0	<0.0002	<0.001	0	<0.0002	<0.001	0
PFDoDA	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0	<0.0002	<0.002	0	<0.0002	<0.002	0
PFHpS	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001	0	<0.0002	<0.001	0	<0.0002	<0.001	0
PFHpA	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001	0	<0.0002	<0.001	0	<0.0002	<0.001	0
PFHxA	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001	0	<0.0002	<0.001	0	<0.0002	<0.001	0
PFNA	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001	0	<0.0002	<0.001	0	<0.0002	<0.001	0
FOSA	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001	0	<0.0002	<0.001	0	<0.0002	<0.001	0
PFPeS	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001	0	<0.0002	<0.001	0	<0.0002	<0.001	0
PFPeA	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0	<0.0002	<0.002	0	<0.0002	<0.002	0
PFTeDA	mg/kg	0.0005 : 0.002 (Interlab)	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.0005	0	<0.0005	<0.002	0	<0.0005	<0.002	0	<0.0005	<0.002	0
PFTrDA	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0	<0.0002	<0.002	0	<0.0002	<0.002	0
PFUnDA	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.002	0	<0.0002	<0.002	0	<0.0002	<0.002	0
PFOS	mg/kg	0.0002 : 0.002 (Interlab)	<0.0002	<0.0002	0	<0.001	<0.0005	0	<0.0002	<0.0002	0	<0.0002	<0.002	0	<0.001	<0.002	0	<0.0002	<0.002	0
PFOA	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001	0	<0.0002	<0.001	0	<0.0002	<0.001	0
PFHxS	mg/kg	0.0002 : 0.001 (Interlab)	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.0002	0	<0.0002	<0.001	0	<0.0002	<0.001	0	<0.0002	<0.001	0

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

**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

Appendix D

Chain of Custody Forms

Appendix D Chain of Custody Forms

1/2

CHAIN OF CUSTODY DOCUMENTATION

ALS Laboratory Group

CLIENT: AECOM		SAMPLER: [redacted]	
ADDRESS / OFFICE:		MOBILE: [redacted]	
PROJECT MANAGER (PM): [redacted]		PHONE:	
PROJECT ID: 60612563		EMAIL REPORT TO: @AECOM.COM	@AECOM.COM
SITE: WBTA OMP	P.O. NO.:	EMAIL INVOICE TO: (if different to repo [redacted]	
RESULTS REQUIRED (Date):	QUOTE NO.:	ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)	

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

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	STD PFAS 0.002-0.1µg/L	HOLD
1	0224_MW115_220509	W	9/5/22		2x 250 ml	plastic	X	
2	0224_MW119_220509	"	"		"	"	X	
3	0224_MW103_220510	"	10/5/22		"	"	X	
4	0224_MW104_220510	"	"		"	"	X	
5	0224_MW105_220510	"	"		"	"	X	
6	0224_MW109_220510	"	"		"	"	X	
7	0224_MW110_220510	"	"		"	"	X	
8	0224_MW101_220510	"	"		"	"	X	
9	0224_MW102_220510	"	"		"	"	X	
10	0224_MW120_220510	"	"		"	"	X	
11	0224_MW122_220510	"	"		"	"	X	
12	0224_MW121_220511	"	11/5/22		"	"	X	
13	0224_PDT001_220509	"	09/5/22		"	"	X	
14	0224_PDT005_220509	"	"		"	"	X	
15	0224_DTH001_220510	"	10/5/22		"	"	X	
16	0224_MW113_220512	"	12/5/22		"	"	X	
17	0224_MW106_220512	"	"		"	"	X	
18	0224_MW117_220512	"	"		"	"	X	
19	0224_MW116_220512	"	"		"	"	X	

Environmental Division Brisbane
Work Order Reference
EB2213545

Telephone : +61-7-3243 7222

RELINQUISHED BY:			RECEIVED BY			METHOD OF SHIPMENT
Name: [redacted]	Date: [redacted]		Name: [redacted]	Date: [redacted]		Con' Note No:
Of:	Time:		Of:	Time:	1300	
Name:	Date:		Name:	Date:		Transport Co:
Of:	Time:		Of:	Time:		

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; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; 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.

ALS LABORATORY GROUP

ENFM (204/5)

CHAIN OF CUSTODY DOCUMENTATION

ALS Laboratory Group

CLIENT: AECOM	SAMPLER: [redacted]
ADDRESS / OFFICE:	MOBILE:
PROJECT MANAGER (PM): [redacted]	PHONE:
PROJECT ID: 60612563	EMAIL REPORT TO: [redacted] @AECOM.COM
SITE: WBTA OMP P.O. NO.:	EMAIL INVOICE TO: (if [redacted]
RESULTS REQUIRED (Date): QUOTE NO.:	ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

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	Container Type / Code	Total bottles	STD PHAS	0.002 - 0.1 µg/L	HOLD
30	0224_MW107_220512	W	12/5/22		2x20 mL plastic	2	X		
31	0224_MW108_220512	"	"		"	"	X		
32	0224_MW111_220512	"	"		"	"	X		
	0224_MW112_220512	"	"		"	"	X		
	0224_MW118_220512	"	"		"	"	X		
	0224_MW114_220512	"	"		"	"	X		
	0224_QC123_220510		10/5/22		"	"	X		
	0224_QC124_220510		10/5/22		"	"	X		
	0224_QC129_220512		12/5/22		"	"	X		
	0224_QC313_220509		9/5/22		"	"	X		
	0224_QC314_220510		10/5/22		"	"	X		
	0224_QC315_220511		11/5/22		"	"	X		
	0224_QC316_220512		12/5/22		"	"	X		
	0224_QC317_220513		13/5/22		"	"	X		

RELINQUISHED BY:			RECEIVED BY			METHOD OF SHIPMENT
Name: [redacted]	Date: [redacted]		Name: [redacted]	Date: [redacted]		Con' Note No:
Of:	Time:		Of:	Time:	1300	
Name:	Date:		Name:	Date:		Transport Co:
Of:	Time:		Of:	Time:		

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; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; 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 DOCUMENTATION

ALS Laboratory Group

CLIENT: AECOM	SAMPLER: [redacted]
ADDRESS / OFFICE:	MOBILE: [redacted]
PROJECT MANAGER (PM): [redacted]	PHONE:
PROJECT ID: 60612563	EMAIL REPORT TO: @AECOM.COM @AECOM.COM
SITE: WBTA OMP P.O. NO.:	EMAIL INVOICE TO: (if different to report) [redacted]
RESULTS REQUIRED (Date): QUOTE NO.:	ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

Std PFAS 0.0002 - 0.001 ng/g

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	Container Type / Code	Total bottles	HOLD
1	0224-SD017-220509	S	9/5/22		Plastic jar	1	X
2	0224-SD018-220509	"	"		"	"	X
3	0224-SD019-220509	"	"		"	"	X
4	0224-SD007-220510	"	10/5/22		"	"	X
5	0224-SD013-220510	"	"		"	"	X
6	0224-SD014-220510	"	"		"	"	X
7	0224-SD004-220510	"	11/05/22		"	"	X
8	0224-SD005-220510	"	"		"	"	X
9	0224-SD008-220510	"	"		"	"	X
10	0224-SD009-220510	"	"		"	"	X
11	0224-SD012-220511	"	"		"	"	X
12	0224-SD027-220511	"	"		"	"	X
13	0224-SD006-220512	"	12/5/22		"	"	X
14	0224-SD025-220512	"	12/5/22		"	"	X
15	0224-SD016-220512	"	"		"	"	X
16	0224-QC121-220510	"	10/5/22		"	"	X
17	0224-QC125-220511	"	11/5/22		"	"	X
18	0224-QC127-220512	"	12/5/22		"	"	X

Environmental Division
Brisbane
Work Order Reference
EB2213563
Telephone : +61-7-3243 7222

RELINQUISHED BY:			RECEIVED BY			METHOD OF SHIPMENT
Name: [redacted]	Date: [redacted]		Name: [redacted]	Date:	13-5-22	Con' Note No:
Of:	Time:		Of:	Time:	1300	
Name:	Date:		Name:	Date:		Transport Co:
Of:	Time:		Of:	Time:		

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; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; 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.

ISTODY DOCUMENTATION

ALS Laboratory Group

SAMPLER:	[redacted]
MOBILE:	
PHONE:	
EMAIL REPORT TO:	[redacted] AECOM.COM
EMAIL INVOICE TO: (if different to report)	

GER (PM): [redacted]

T ID: 60612563

ITE: WBTA OMP P.O. NO.:

RESULTS REQUIRED (Date): QUOTE NO.:

ANALYSIS REQUIRED including SUITES (note - suite codes must be listed to attract suite prices)

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate)
Intact: Yes No N/A
SAMPLE TEMPERATURE
CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

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	Container Type / Code	Total bottles	Trace PFAS 0.0005 - 0.002 ug/L	HOLD
1	0224-SW017-220509	W	9/5/22		2x125 mL	01oSHc	X	
2	0224-SW018-220509	"	"		"	"	X	
3	0224-SW019-220509	"	"		"	"	X	
4	0224-SW007-220510	"	10/5/22		"	"	X	
5	0224-SW013-220510	"	"		"	"	X	
6	0224-SW014-220510	"	"		"	"	X	
7	0224-SW004-220511	"	11/5/22		"	"	X	
8	0224-SW005-220511	"	"		"	"	X	
9	0224-SW008-220511	"	"		"	"	X	
10	0224-SW009-220511	"	"		"	"	X	
11	0224-SW012-220511	"	"		"	"	X	
12	0224-SW027-220511	"	"		"	"	X	
13	0224-SW006-220512	"	12/5/22		"	"	X	
14	0224-SW025-220512	"	"		"	"	X	
15	0224-SW016-220512	"	"		"	"	X	
16	0224-QC122-220510	"	10/5/22		"	"	X	
17	0224-QC126-220511	"	11/5/22		"	"	X	
18	0224-QC128-220512	"	12/5/22		"	"	X	

Environmental Division
Brisbane
Work Order Reference
EB2213573

Telephone : +61-7-3243 7222

RELINQUISHED BY:				RECEIVED BY				METHOD OF SHIPMENT
Name:	[redacted]	Date:	[redacted]	Name:	[redacted]	Date:	13.5.22	Con' Note No:
Of:		Time:		Of:		Time:	1300	
Name:		Date:		Name:		Date:		Transport Co:
Of:		Time:		Of:		Time:		

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; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; 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 DOCUMENTATION

CLIENT: AECOM

ADDRESS / OFFICE:

PROJECT MANAGER (PM): [redacted]

PROJECT ID: 60612563

SITE: WBTA OMP P.O. NO.:

RESULTS REQUIRED (Date): QUOTE NO.:

SAMPLER: [redacted]

MOBILE:

PHONE:

EMAIL REPORT TO: @AECOM.COM @AECOM.COM

EMAIL INVOICE TO: (if different to report) [redacted]

ANALYSIS REQUIRED including SUITES (NOTE: Suite codes must be listed to attract Suite prices)

ALS Laboratory Group

FOR LABORATORY USE ONLY

COOLER SEAL (circle applicable) Intact: Yes No N/A

SAMPLE TEMPERATURE CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		0.0005 - 0.0002 Trace PFAS	0.0002 - 0.001 Std PFAS												HOLD	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															
1	0224-SW021-220513	W	13/5/22		2X 125		X														
2	0224-SD021-220513	S	"		1X [redacted]			X													

Environmental Division
Brisbane
Work Order Reference
EB2213615

Telephone : +61-7-3243 7222

RELINQUISHED BY:				RECEIVED BY				METHOD OF SHIPMENT
Name: [redacted]		Date: [redacted]		Name: [redacted]		Date: [redacted]		Con' Note No:
Of: [redacted]		Time: [redacted]		Of: [redacted]		Time: [redacted]		
Name:		Date:		Name:		Date:		Transport Co:
Of:		Time:		Of:		Time:		

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; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; 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 DOCUMENTATION

CLIENT: AECOM
ADDRESS / OFFICE:
PROJECT MANAGER (PM): [redacted]
PROJECT ID: 60612563
SITE: WBTA OMP
P.O. NO.:
RESULTS REQUIRED (Date):
QUOTE NO.:

SAMPLER: [redacted]
MOBILE:
PHONE:
EMAIL REPORT TO:
EMAIL INVOICE TO:

ALS Laboratory Group

@AECOM.COM
ecom.com

FOR LABORATORY USE ONLY
COOLER SEAL (circle appropriate) Intact: Yes No N/A
SAMPLE TEMPERATURE CHILLED: Yes No

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

ANALYSIS REQUIRED including SUITES (note suite codes must be listed to attract suite prices)

SAMPLE INFORMATION (note: S = Soil, W=Water)					CONTAINER INFORMATION		0.0005 - 0.02 Trace PFAS	0.0002 - 0.001 Std PFAS	HOLD
ALS ID	SAMPLE ID	MATRIX	DATE	Time	Type / Code	Total bottles			
1	0224_SW022_220513	W	13/5/20		2x125		X		
2	0224_SW023_220513	W	"		"		X		
3	0224_SD022_220513	S	"		1 Jar			X	
4	0224_SD023_220513	S	"		"			X	

Notes: e.g. Highly contaminated samples
e.g. "High PAHs expected".
Extra volume for QC or trace LORs etc.

Environmental Division
Brisbane
Work Order Reference
EB2213618

Telephone : + 61-7-3243 7222

RELINQUISHED BY:				RECEIVED BY				METHOD OF SHIPMENT
Name: [redacted]		Date: [redacted]		Name: [redacted]		Date: [redacted]		Con' Note No:
Of:		Time:		Of:		Time:	1300	
Name:		Date:		Name:		Date:		Transport Co:
Of:		Time:		Of:		Time:		

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; V = VOA Vial HCl Preserved; VS = VOA Vial Sulphuric Preserved; 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.

[redacted]

√26/5 1/1

AECOM	LABORATORY: [redacted]	All results to be provided in MRED format	FOR LABORATORY USE ONLY
ADDRESS:	ADDRESS:	email address: [redacted]	
PHONE NO:	PHONE NO:	PURCHASE ORDER NUMBER:	
FAX NO:	FAX NO:		
PROJECT NAME: WBTA OMP	Quote number:		AECOM61220517
PROJECT NO: 60612563	PROJECT MANAGER: [redacted]		
COMMENTS:	SAMPLERS: [redacted]		

0.0002 – 0.001 µg/kg | 0.0005 – 0.002 µg/L | 0.002 – 0.1 µg/L

ANALYSIS REQUIRED

LAB ID	SAMPLE ID	DATE	MATRIX	CONTAINER TYPE & PRESERVATIVE	TOTAL NUMBER OF CONTAINERS	STD PFAS Soils	Trace PFAS water	Std PFAS Water	Hold	
	0224_QC221_220510	10/5/22	S			X	X			N22/009534
	0224_QC222_220510	"	W					X		N22/009535
	0224_QC224_220510	"	"					X		N22/009536
	0224_QC223_220511	11/5/22	"			X				N22/009537
	0224_QC225_220511	"	S				X			N22/009538
	0224_QC226_220511	"	W			X				N22/009539
	0224_QC227_220512	12/5/22	S				X			N22/009540
	0224_QC228_220512	"	W					X		N22/009541
	0224_QC229_220512	"	"							N22/009542

RECEIVED
17 MAY 2022
BY: N.N. 16-20

TOTAL NO:

CONTAINER TYPE AND PRESERVATIVE CODES
J = Jar; A = Amber Bottle; VH = HCl Preserved Vial; P = Plastic Bottle; N = Nitric Acid Preserved; S = Sulphuric Acid Preserved; C = Sodium Hydroxide Preserved; B = Sterile Bottle; Z = Zinc Acetate Preserved; E = EDTA Preserved; O = Other

PLEASE SIGN AND FAX TO URS UPON RECEIPT

Custody Seal ? Y N NA
Samples Cold ? Y N NA
Comments:

RELINQUISHED BY: [redacted]
DATE:
RECEIVED BY:
DATE: TIME:

Appendix E

Laboratory Analytical Certificates and QA/QC Reports

Appendix E Laboratory Analytical Certificates and QA/QC Reports

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EB2213545**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: QLD_0224_PFASOMP	Page	: 1 of 3
Order number	: 60612563 4.1	Quote number	: ES2020AECOMAU0024 (SY/139/19 V3_QLD)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: WBTA OMP		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-May-2022 13:00	Issue Date	: 17-May-2022
Client Requested Due Date	: 30-May-2022	Scheduled Reporting Date	: **30-May-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: -1.3°C, 3.2°C, 3.5°C, 2.4°C - Ice present
Receipt Detail	: SMALL/MEDIUM ESKY	No. of samples received / analysed	: 33 / 33

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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 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)
EB2213545-001	09-May-2022 00:00	0224_MW115_220509	✓
EB2213545-002	09-May-2022 00:00	0224_MW119_220509	✓
EB2213545-003	10-May-2022 00:00	0224_MW103_220510	✓
EB2213545-004	10-May-2022 00:00	0224_MW104_220510	✓
EB2213545-005	10-May-2022 00:00	0224_MW105_220510	✓
EB2213545-006	10-May-2022 00:00	0224_MW109_220510	✓
EB2213545-007	10-May-2022 00:00	0224_MW110_220510	✓
EB2213545-008	10-May-2022 00:00	0224_MW101_220510	✓
EB2213545-009	10-May-2022 00:00	0224_MW102_220510	✓
EB2213545-010	10-May-2022 00:00	0224_MW120_220510	✓
EB2213545-011	10-May-2022 00:00	0224_MW122_220510	✓
EB2213545-012	11-May-2022 00:00	0224_MW121_220511	✓
EB2213545-013	09-May-2022 00:00	0224_POT001_220509	✓
EB2213545-014	09-May-2022 00:00	0224_POT005_220509	✓
EB2213545-015	10-May-2022 00:00	0224_OTH001_220510	✓
EB2213545-016	12-May-2022 00:00	0224_MW113_220512	✓
EB2213545-017	12-May-2022 00:00	0224_MW106_220512	✓
EB2213545-018	12-May-2022 00:00	0224_MW117_220512	✓
EB2213545-019	12-May-2022 00:00	0224_MW116_220512	✓
EB2213545-020	12-May-2022 00:00	0224_MW107_220512	✓
EB2213545-021	12-May-2022 00:00	0224_MW108_220512	✓
EB2213545-022	12-May-2022 00:00	0224_MW111_220512	✓
EB2213545-023	12-May-2022 00:00	0224_MW112_220512	✓
EB2213545-024	12-May-2022 00:00	0224_MW118_220512	✓
EB2213545-025	12-May-2022 00:00	0224_MW114_220512	✓
EB2213545-026	11-May-2022 00:00	0224_QC123_220511	✓
EB2213545-027	10-May-2022 00:00	0224_QC124_220510	✓
EB2213545-028	12-May-2022 00:00	0224_QC129_220512	✓
EB2213545-029	09-May-2022 00:00	0224_QC313_220509	✓
EB2213545-030	10-May-2022 00:00	0224_QC314_220510	✓
EB2213545-031	11-May-2022 00:00	0224_QC315_220511	✓
EB2213545-032	12-May-2022 00:00	0224_QC316_220512	✓
EB2213545-033	13-May-2022 00:00	0224_QC317_220513	✓

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]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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 - ESDAT (ESDAT)	Email	

DERP ESDAT REPORTS

- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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	
- A4 - AU Tax Invoice (INV)	Email	
- Chain of Custody (CoC) (COC)	Email	
- EDI Format - ESDAT (ESDAT)	Email	

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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 - ESDAT (ESDAT)	Email	

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2213545**	Page	: 1 of 17
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022 13:00
Order number	: 60612563 4.1	Date Analysis Commenced	: 18-May-2022
C-O-C number	: ----	Issue Date	: 14-Jun-2022 17:58
Sampler	: [redacted]		
Site	: WBTA OMP		
Quote number	: SY/139/19 V3_QLD		
No. of samples received	: 33		
No. of samples analysed	: 33		

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
	2IC Organic Chemist	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 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 (14/06/2022): This report has been amended following a change to the EP231X PFAS results (PFHxS, PFOS, Sum of PFAS and Sum of PFHxS and PFOS) reported for samples '0224_QC123_220511' (EB2213545-026), '0224_QC124_220510' (-027), '0224_QC129_220512' (-028) and '0224_QC313_220509' (-029) due to a sequence error. All details are recorded in client query 22BNCC259 and a full investigation will be detailed in corrective action request 22BNC070.
- 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	0224_MW115_220509	0224_MW119_220509	0224_MW103_220510	0224_MW104_220510	0224_MW105_220510
				Sampling date / time	09-May-2022 00:00	09-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
					EB2213545-001	EB2213545-002	EB2213545-003	EB2213545-004	EB2213545-005
					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	<0.01
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**)

Compound	CAS Number	LOR	Unit	Sample ID	0224_MW115_220509	0224_MW119_220509	0224_MW103_220510	0224_MW104_220510	0224_MW105_220510
				Sampling date / time	09-May-2022 00:00	09-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
					EB2213545-001	EB2213545-002	EB2213545-003	EB2213545-004	EB2213545-005
					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	<0.01
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	%		**97.4**	**95.8**	**103**	**89.7**	**97.0**
13C8-PFOA	----	0.02	%		**93.1**	**87.9**	**90.3**	**98.2**	**87.9**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	0224_MW109_220510	0224_MW110_220510	0224_MW101_220510	0224_MW102_220510	0224_MW120_220510
				Sampling date / time	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
					EB2213545-006	EB2213545-007	EB2213545-008	EB2213545-009	EB2213545-010
					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		**0.02**	<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**)

Compound	CAS Number	LOR	Unit	Sample ID	0224_MW109_220510	0224_MW110_220510	0224_MW101_220510	0224_MW102_220510	0224_MW120_220510
				Sampling date / time	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
					EB2213545-006	EB2213545-007	EB2213545-008	EB2213545-009	EB2213545-010
					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		**0.02**	<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		**0.02**	<0.01	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**98.0**	**107**	**99.2**	**106**
13C8-PFOA	----	0.02	%		**91.0**	**89.9**	**97.5**	**92.6**	**89.0**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	0224_MW122_220510	0224_MW121_220511	0224_POT001_220509	0224_POT005_220509	0224_OTH001_220510
				Sampling date / time	10-May-2022 00:00	11-May-2022 00:00	09-May-2022 00:00	09-May-2022 00:00	10-May-2022 00:00
					EB2213545-011	EB2213545-012	EB2213545-013	EB2213545-014	EB2213545-015
					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	<0.02	<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		**0.16**	**0.06**	**0.03**	**0.02**	**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		**0.04**	**0.02**	<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	0224_MW122_220510	0224_MW121_220511	0224_POT001_220509	0224_POT005_220509	0224_OTH001_220510
				Sampling date / time	10-May-2022 00:00	11-May-2022 00:00	09-May-2022 00:00	09-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213545-011	EB2213545-012	EB2213545-013	EB2213545-014	EB2213545-015
					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		**0.20**	**0.08**	**0.03**	**0.02**	**0.01**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.20**	**0.08**	**0.03**	**0.02**	**0.01**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.20**	**0.08**	**0.03**	**0.02**	**0.01**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.6**	**92.9**	**105**	**101**	**98.6**
13C8-PFOA	----	0.02	%		**95.6**	**93.7**	**90.2**	**89.7**	**98.0**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	0224_MW113_220512	0224_MW106_220512	0224_MW117_220512	0224_MW116_220512	0224_MW107_220512
				Sampling date / time	12-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00
					EB2213545-016	EB2213545-017	EB2213545-018	EB2213545-019	EB2213545-020
					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	0.01	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	0224_MW113_220512	0224_MW106_220512	0224_MW117_220512	0224_MW116_220512	0224_MW107_220512
				Sampling date / time	12-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213545-016	EB2213545-017	EB2213545-018	EB2213545-019	EB2213545-020
					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	<0.01
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	%		**85.2**	**87.5**	**86.8**	**100**	**107**
13C8-PFOA	----	0.02	%		**90.0**	**91.7**	**93.0**	**91.9**	**89.6**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	0224_MW108_220512	0224_MW111_220512	0224_MW112_220512	0224_MW118_220512	0224_MW114_220512
				Sampling date / time	12-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00
					EB2213545-021	EB2213545-022	EB2213545-023	EB2213545-024	EB2213545-025
					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	0.01	µg/L		<0.01	<0.01	<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		<0.01	<0.01	<0.01	**0.03**	<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**)

Compound	CAS Number	LOR	Unit	Sample ID	0224_MW108_220512	0224_MW111_220512	0224_MW112_220512	0224_MW118_220512	0224_MW114_220512
				Sampling date / time	12-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00
					EB2213545-021	EB2213545-022	EB2213545-023	EB2213545-024	EB2213545-025
					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		<0.01	<0.01	<0.01	**0.09**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	**0.09**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	<0.01	<0.01	**0.09**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**94.6**	**93.4**	**95.6**	**93.1**	**105**
13C8-PFOA	----	0.02	%		**88.4**	**90.9**	**89.1**	**93.0**	**91.9**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	0224_QC123_220511	0224_QC124_220510	0224_QC129_220512	0224_QC313_220509	0224_QC314_220510
				Sampling date / time	11-May-2022 00:00	10-May-2022 00:00	12-May-2022 00:00	09-May-2022 00:00	10-May-2022 00:00
					EB2213545-026	EB2213545-027	EB2213545-028	EB2213545-029	EB2213545-030
					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**	**0.13**	**0.05**	<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		**0.02**	**0.04**	**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: WATER (Matrix: WATER)				Sample ID	0224_QC123_220511	0224_QC124_220510	0224_QC129_220512	0224_QC313_220509	0224_QC314_220510
				Sampling date / time	11-May-2022 00:00	10-May-2022 00:00	12-May-2022 00:00	09-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213545-026	EB2213545-027	EB2213545-028	EB2213545-029	EB2213545-030
					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		**0.08**	**0.17**	**0.07**	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.08**	**0.17**	**0.07**	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.08**	**0.17**	**0.07**	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**103**	**90.1**	**108**	**98.7**	**89.3**
13C8-PFOA	----	0.02	%		**101**	**99.2**	**103**	**102**	**93.3**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)			Sample ID	0224_QC315_220511	0224_QC316_220512	0224_QC317_220513	----	----
			Sampling date / time	11-May-2022 00:00	12-May-2022 00:00	13-May-2022 00:00	----	----
Compound	CAS Number	LOR	Unit	EB2213545-031	EB2213545-032	EB2213545-033	--------	--------
				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	0224_QC315_220511	0224_QC316_220512	0224_QC317_220513	----	----
				Sampling date / time	11-May-2022 00:00	12-May-2022 00:00	13-May-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2213545-031	EB2213545-032	EB2213545-033	--------	--------
					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	%		**93.2**	**94.1**	**88.5**	----	----
13C8-PFOA	----	0.02	%		**97.9**	**94.6**	**92.7**	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**

Compound	CAS Number	Recovery Limits (%) Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2213545**	Page	: 1 of 6
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022
Order number	: 60612563 4.1	Date Analysis Commenced	: 18-May-2022
C-O-C number	: ----	Issue Date	: 14-Jun-2022
Sampler	: [redacted]		
Site	: WBTA OMP		
Quote number	: SY/139/19 V3_QLD		
No. of samples received	: 33		
No. of samples analysed	: 33		

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]	Assistant Laboratory Manager	Brisbane Organics, Stafford, QLD
	2IC Organic Chemist	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%.

- **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: 4355404)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	114	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	80.6	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	73.7	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	104	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	106	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	120	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4355405)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	114	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	101	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	90.2	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	106	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	99.8	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	118	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4355407)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	122	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	117	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	112	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	122	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	102	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	125	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4355404)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	108	73.0	129
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.25 µg/L	110	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	104	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	111	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	106	69.0	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.25 µg/L	104	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	102	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	88.4	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	83.4	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4355405)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	112	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: 4355405) - continued								
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	117	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	110	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	106	71.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.25 µg/L	100	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	109	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	89.4	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	82.8	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	122	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4355407)								
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	118	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	112	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	123	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	119	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	120	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	104	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: 4355404)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	89.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	94.1	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	92.4	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	92.1	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	95.0	62.6	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	97.8	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	109	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4355405)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	107	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	115	60.5	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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4355405) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	116	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	113	62.6	138
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	117	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4355407)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	120	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	132	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	127	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	113	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	131	62.6	138
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	122	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4355404)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	115	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	116	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	116	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	113	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4355405)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	117	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	119	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.24 µg/L	124	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	118	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4355407)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	120	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	120	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	114	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	122	64.2	133
EP231P: PFAS Sums (QCLot: 4355404)								
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	----	----	----	----

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
EP231P: PFAS Sums (QCLot: 4355404) - continued								
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 4355405)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 4355407)								
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	: **EB2213545**	Page	: 1 of 8
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022
Site	: WBTA OMP	Issue Date	: 14-Jun-2022
Sampler	: [redacted]	No. of samples received	: 33
Order number	: 60612563 4.1	No. of samples analysed	: 33

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	40	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	40	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) 0224_MW115_220509, 0224_MW119_220509, 0224_POT001_220509, 0224_POT005_220509, 0224_QC313_220509	**09-May-2022**	**25-May-2022**	05-Nov-2022	✓	**25-May-2022**	05-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW103_220510, 0224_MW104_220510, 0224_MW105_220510, 0224_MW109_220510, 0224_MW110_220510, 0224_MW101_220510, 0224_MW102_220510, 0224_MW120_220510, 0224_MW122_220510, 0224_OTH001_220510, 0224_QC124_220510, 0224_QC314_220510	**10-May-2022**	**25-May-2022**	06-Nov-2022	✓	**25-May-2022**	06-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW121_220511, 0224_QC123_220511, 0224_QC315_220511	**11-May-2022**	**25-May-2022**	07-Nov-2022	✓	**25-May-2022**	07-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW113_220512, 0224_MW106_220512, 0224_MW117_220512, 0224_MW116_220512, 0224_MW107_220512, 0224_MW108_220512, 0224_MW111_220512, 0224_MW112_220512, 0224_MW118_220512, 0224_MW114_220512, 0224_QC129_220512, 0224_QC316_220512	**12-May-2022**	**25-May-2022**	08-Nov-2022	✓	**25-May-2022**	08-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_QC317_220513	**13-May-2022**	**25-May-2022**	09-Nov-2022	✓	**25-May-2022**	09-Nov-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) 0224_MW115_220509, 0224_MW119_220509, 0224_POT001_220509, 0224_POT005_220509, 0224_QC313_220509	**09-May-2022**	**25-May-2022**	05-Nov-2022	✓	**25-May-2022**	05-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW103_220510, 0224_MW104_220510, 0224_MW105_220510, 0224_MW109_220510, 0224_MW110_220510, 0224_MW101_220510, 0224_MW102_220510, 0224_MW120_220510, 0224_MW122_220510, 0224_OTH001_220510, 0224_QC124_220510, 0224_QC314_220510	**10-May-2022**	**25-May-2022**	06-Nov-2022	✓	**25-May-2022**	06-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW121_220511, 0224_QC123_220511, 0224_QC315_220511	**11-May-2022**	**25-May-2022**	07-Nov-2022	✓	**25-May-2022**	07-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW113_220512, 0224_MW106_220512, 0224_MW117_220512, 0224_MW116_220512, 0224_MW107_220512, 0224_MW108_220512, 0224_MW111_220512, 0224_MW112_220512, 0224_MW118_220512, 0224_MW114_220512, 0224_QC129_220512, 0224_QC316_220512	**12-May-2022**	**25-May-2022**	08-Nov-2022	✓	**25-May-2022**	08-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_QC317_220513	**13-May-2022**	**25-May-2022**	09-Nov-2022	✓	**25-May-2022**	09-Nov-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) 0224_MW115_220509, 0224_MW119_220509, 0224_POT001_220509, 0224_POT005_220509, 0224_QC313_220509	**09-May-2022**	**25-May-2022**	05-Nov-2022	✓	**25-May-2022**	05-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW103_220510, 0224_MW104_220510, 0224_MW105_220510, 0224_MW109_220510, 0224_MW110_220510, 0224_MW101_220510, 0224_MW102_220510, 0224_MW120_220510, 0224_MW122_220510, 0224_OTH001_220510, 0224_QC124_220510, 0224_QC314_220510	**10-May-2022**	**25-May-2022**	06-Nov-2022	✓	**25-May-2022**	06-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW121_220511, 0224_QC123_220511, 0224_QC315_220511	**11-May-2022**	**25-May-2022**	07-Nov-2022	✓	**25-May-2022**	07-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW113_220512, 0224_MW106_220512, 0224_MW117_220512, 0224_MW116_220512, 0224_MW107_220512, 0224_MW108_220512, 0224_MW111_220512, 0224_MW112_220512, 0224_MW118_220512, 0224_MW114_220512, 0224_QC129_220512, 0224_QC316_220512	**12-May-2022**	**25-May-2022**	08-Nov-2022	✓	**25-May-2022**	08-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_QC317_220513	**13-May-2022**	**25-May-2022**	09-Nov-2022	✓	**25-May-2022**	09-Nov-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) 0224_MW115_220509, 0224_MW119_220509, 0224_POT001_220509, 0224_POT005_220509, 0224_QC313_220509	**09-May-2022**	**25-May-2022**	05-Nov-2022	✓	**25-May-2022**	05-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW103_220510, 0224_MW104_220510, 0224_MW105_220510, 0224_MW109_220510, 0224_MW110_220510, 0224_MW101_220510, 0224_MW102_220510, 0224_MW120_220510, 0224_MW122_220510, 0224_OTH001_220510, 0224_QC124_220510, 0224_QC314_220510	**10-May-2022**	**25-May-2022**	06-Nov-2022	✓	**25-May-2022**	06-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW121_220511, 0224_QC123_220511, 0224_QC315_220511	**11-May-2022**	**25-May-2022**	07-Nov-2022	✓	**25-May-2022**	07-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW113_220512, 0224_MW106_220512, 0224_MW117_220512, 0224_MW116_220512, 0224_MW107_220512, 0224_MW108_220512, 0224_MW111_220512, 0224_MW112_220512, 0224_MW118_220512, 0224_MW114_220512, 0224_QC129_220512, 0224_QC316_220512	**12-May-2022**	**25-May-2022**	08-Nov-2022	✓	**25-May-2022**	08-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_QC317_220513	**13-May-2022**	**25-May-2022**	09-Nov-2022	✓	**25-May-2022**	09-Nov-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) 0224_MW115_220509, 0224_MW119_220509, 0224_POT001_220509, 0224_POT005_220509, 0224_QC313_220509	**09-May-2022**	**25-May-2022**	05-Nov-2022	✓	**25-May-2022**	05-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW103_220510, 0224_MW104_220510, 0224_MW105_220510, 0224_MW109_220510, 0224_MW110_220510, 0224_MW101_220510, 0224_MW102_220510, 0224_MW120_220510, 0224_MW122_220510, 0224_OTH001_220510, 0224_QC124_220510, 0224_QC314_220510	**10-May-2022**	**25-May-2022**	06-Nov-2022	✓	**25-May-2022**	06-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW121_220511, 0224_QC123_220511, 0224_QC315_220511	**11-May-2022**	**25-May-2022**	07-Nov-2022	✓	**25-May-2022**	07-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_MW113_220512, 0224_MW106_220512, 0224_MW117_220512, 0224_MW116_220512, 0224_MW107_220512, 0224_MW108_220512, 0224_MW111_220512, 0224_MW112_220512, 0224_MW118_220512, 0224_MW114_220512, 0224_QC129_220512, 0224_QC316_220512	**12-May-2022**	**25-May-2022**	08-Nov-2022	✓	**25-May-2022**	08-Nov-2022	✓
HDPE (no PTFE) (EP231X) 0224_QC317_220513	**13-May-2022**	**25-May-2022**	09-Nov-2022	✓	**25-May-2022**	09-Nov-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	40	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	40	**7.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	3	40	**7.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	40	**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

QUALITY CONTROL REPORT

Work Order	: **EB2213563**	Page	: 1 of 7
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: [redacted]
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022
Order number	: 60612563 4.1	Date Analysis Commenced	: 18-May-2022
C-O-C number	: ----	Issue Date	: 25-May-2022
Sampler	: [redacted]		
Site	: WBTA OMP		
Quote number	: SY/139/19 V3_QLD		
No. of samples received	: 18		
No. of samples analysed	: 18		

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]	Assistant Laboratory Manager	Brisbane Inorganics, Stafford, QLD
	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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4344425)									
EB2213563-001	0224_SD017_220509	EA055: Moisture Content	----	0.1	%	65.8	62.1	5.8	0% - 20%
EB2213563-011	0224_SD012_220511	EA055: Moisture Content	----	0.1	%	31.8	31.6	0.6	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4344424)									
EB2213563-001	0224_SD017_220509	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EB2213563-011	0224_SD012_220511	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4344424)									
EB2213563-001	0224_SD017_220509	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4344424) - continued									
EB2213563-001	0224_SD017_220509	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EB2213563-011	0224_SD012_220511	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4344424)									
EB2213563-001	0224_SD017_220509	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2213563-011	0224_SD012_220511	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4344424)									
EB2213563-001	0224_SD017_220509	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EB2213563-011	0224_SD012_220511	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4344424)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	114	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	118	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	130	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	132	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	133	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	131	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4344424)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	120	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	109	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	116	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	122	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	124	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	70.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.8	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	118	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4344424)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	111	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	130	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	128	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	134	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	113	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4344424)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	106	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	138	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	115	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4344424) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	108	54.8	124

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4344424)							
EB2213563-002	0224_SD018_220509	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	111	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	112	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	94.1	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	104	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	112	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	108	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4344424)							
EB2213563-002	0224_SD018_220509	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	117	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	97.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	102	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	103	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	127	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	126	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	95.7	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	80.4	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	76.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	112	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	110	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4344424)							
EB2213563-002	0224_SD018_220509	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	100	48.0	128
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	97.0	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	122	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	125	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	100	63.0	144

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4344424) - continued							
EB2213563-002	0224_SD018_220509	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	97.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4344424)							
EB2213563-002	0224_SD018_220509	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	94.9	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	133	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	100	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	78.8	70.0	130

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EB2213563**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: QLD_0224_PFASOMP	Page	: 1 of 3
Order number	: 60612563 4.1	Quote number	: ES2020AECOMAU0024 (SY/139/19 V3_QLD)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: WBTA OMP		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-May-2022 13:00	Issue Date	: 17-May-2022
Client Requested Due Date	: 31-May-2022	Scheduled Reporting Date	: **31-May-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: 3.2°C, -1.3°C, 3.5°C, 2.4°C - Ice present
Receipt Detail	: MEDIUM ESKY	No. of samples received / analysed	: 18 / 18

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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 Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EB2213563-001	09-May-2022 00:00	0224_SD017_220509	✓	✓
EB2213563-002	09-May-2022 00:00	0224_SD018_220509	✓	✓
EB2213563-003	09-May-2022 00:00	0224_SD019_220509	✓	✓
EB2213563-004	10-May-2022 00:00	0224_SD007_220510	✓	✓
EB2213563-005	10-May-2022 00:00	0224_SD013_220510	✓	✓
EB2213563-006	10-May-2022 00:00	0224_SD014_220510	✓	✓
EB2213563-007	11-May-2022 00:00	0224_SD004_220511	✓	✓
EB2213563-008	11-May-2022 00:00	0224_SD005_220511	✓	✓
EB2213563-009	11-May-2022 00:00	0224_SD008_220511	✓	✓
EB2213563-010	11-May-2022 00:00	0224_SD009_220511	✓	✓
EB2213563-011	11-May-2022 00:00	0224_SD012_220511	✓	✓
EB2213563-012	11-May-2022 00:00	0224_SD027_220511	✓	✓
EB2213563-013	12-May-2022 00:00	0224_SD006_220512	✓	✓
EB2213563-014	12-May-2022 00:00	0224_SD025_220512	✓	✓
EB2213563-015	12-May-2022 00:00	0224_SD016_220512	✓	✓
EB2213563-016	10-May-2022 00:00	0224_QC121_220510	✓	✓
EB2213563-017	11-May-2022 00:00	0224_QC125_220511	✓	✓
EB2213563-018	12-May-2022 00:00	0224_QC127_220512	✓	✓

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	AP_CustomerService.ANZ@aecom.com

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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 - ESDAT (ESDAT)	Email	

DERP ESDAT REPORTS

- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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	
- A4 - AU Tax Invoice (INV)	Email	
- Chain of Custody (CoC) (COC)	Email	
- EDI Format - ESDAT (ESDAT)	Email	

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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 - ESDAT (ESDAT)	Email	

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2213563**	Page	: 1 of 11
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022 13:00
Order number	: 60612563 4.1	Date Analysis Commenced	: 18-May-2022
C-O-C number	: ----	Issue Date	: 25-May-2022 16:52
Sampler	: [redacted]		
Site	: WBTA OMP		
Quote number	: SY/139/19 V3_QLD		
No. of samples received	: 18		
No. of samples analysed	: 18		

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 Inorganics, Stafford, QLD
	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 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 PFAS: The LOR values of PFOS for particular samples have been raised due to matrix interferences.
- 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: SOIL (Matrix: SOIL)				Sample ID	0224_SD017_220509	0224_SD018_220509	0224_SD019_220509	0224_SD007_220510	0224_SD013_220510
				Sampling date / time	09-May-2022 00:00	09-May-2022 00:00	09-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213563-001	EB2213563-002	EB2213563-003	EB2213563-004	EB2213563-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**65.8**	**27.9**	**35.6**	**24.9**	**18.9**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0003	<0.0006	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0224_SD017_220509	0224_SD018_220509	0224_SD019_220509	0224_SD007_220510	0224_SD013_220510
				Sampling date / time	09-May-2022 00:00	09-May-2022 00:00	09-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213563-001	EB2213563-002	EB2213563-003	EB2213563-004	EB2213563-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**87.5**	**98.5**	**100**	**98.0**	**96.5**
13C8-PFOA	----	0.0002	%		**97.5**	**93.0**	**97.0**	**100**	**97.0**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	0224_SD014_220510	0224_SD004_220511	0224_SD005_220511	0224_SD008_220511	0224_SD009_220511
			Sampling date / time	10-May-2022 00:00	11-May-2022 00:00	11-May-2022 00:00	11-May-2022 00:00	11-May-2022 00:00
Compound	CAS Number	LOR	Unit	EB2213563-006	EB2213563-007	EB2213563-008	EB2213563-009	EB2213563-010
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**29.7**	**40.3**	**32.8**	**30.9**	**28.9**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0224_SD014_220510	0224_SD004_220511	0224_SD005_220511	0224_SD008_220511	0224_SD009_220511
				Sampling date / time	10-May-2022 00:00	11-May-2022 00:00	11-May-2022 00:00	11-May-2022 00:00	11-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213563-006	EB2213563-007	EB2213563-008	EB2213563-009	EB2213563-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**96.5**	**81.5**	**97.5**	**92.5**	**104**
13C8-PFOA	----	0.0002	%		**95.0**	**97.5**	**94.0**	**90.5**	**102**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0224_SD012_220511	0224_SD027_220511	0224_SD006_220512	0224_SD025_220512	0224_SD016_220512
				Sampling date / time	11-May-2022 00:00	11-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213563-011	EB2213563-012	EB2213563-013	EB2213563-014	EB2213563-015
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**31.8**	**39.5**	**23.0**	**43.1**	**32.4**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0010	<0.0002	<0.0010	<0.0003
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0224_SD012_220511	0224_SD027_220511	0224_SD006_220512	0224_SD025_220512	0224_SD016_220512
				Sampling date / time	11-May-2022 00:00	11-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00	12-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213563-011	EB2213563-012	EB2213563-013	EB2213563-014	EB2213563-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**96.0**	**98.5**	**91.0**	**98.0**	**97.5**
13C8-PFOA	----	0.0002	%		**94.5**	**97.0**	**93.5**	**101**	**100**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0224_QC121_220510	0224_QC125_220511	0224_QC127_220512	----	----
				Sampling date / time	10-May-2022 00:00	11-May-2022 00:00	12-May-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2213563-016	EB2213563-017	EB2213563-018	--------	--------
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**31.5**	**25.2**	**22.6**	**----**	**----**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0005	<0.0002	**----**	**----**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	**----**	**----**
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**----**	**----**
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**----**	**----**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0224_QC121_220510	0224_QC125_220511	0224_QC127_220512	----	----
				Sampling date / time	10-May-2022 00:00	11-May-2022 00:00	12-May-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2213563-016	EB2213563-017	EB2213563-018	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**90.5**	**114**	**100**	----	----
13C8-PFOA	----	0.0002	%		**106**	**92.0**	**98.0**	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2213563**	Page	: 1 of 6
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022
Site	: WBTA OMP	Issue Date	: 25-May-2022
Sampler	: [redacted]	No. of samples received	: 18
Order number	: 60612563 4.1	No. of samples analysed	: 18

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055) 0224_SD017_220509, 0224_SD018_220509, 0224_SD019_220509	**09-May-2022**	**----**	----	----	**18-May-2022**	23-May-2022	✓
HDPE Soil Jar (EA055) 0224_SD007_220510, 0224_SD013_220510, 0224_SD014_220510, 0224_QC121_220510	**10-May-2022**	**----**	----	----	**18-May-2022**	24-May-2022	✓
HDPE Soil Jar (EA055) 0224_SD004_220511, 0224_SD005_220511, 0224_SD008_220511, 0224_SD009_220511, 0224_SD012_220511, 0224_SD027_220511, 0224_QC125_220511	**11-May-2022**	**----**	----	----	**18-May-2022**	25-May-2022	✓
HDPE Soil Jar (EA055) 0224_SD006_220512, 0224_SD025_220512, 0224_SD016_220512, 0224_QC127_220512	**12-May-2022**	**----**	----	----	**18-May-2022**	26-May-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) 0224_SD017_220509, 0224_SD018_220509, 0224_SD019_220509	**09-May-2022**	**18-May-2022**	05-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD007_220510, 0224_SD013_220510, 0224_SD014_220510, 0224_QC121_220510	**10-May-2022**	**18-May-2022**	06-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD004_220511, 0224_SD005_220511, 0224_SD008_220511, 0224_SD009_220511, 0224_SD012_220511, 0224_SD027_220511, 0224_QC125_220511	**11-May-2022**	**18-May-2022**	07-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD006_220512, 0224_SD025_220512, 0224_SD016_220512, 0224_QC127_220512	**12-May-2022**	**18-May-2022**	08-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) 0224_SD017_220509, 0224_SD018_220509, 0224_SD019_220509	**09-May-2022**	**18-May-2022**	05-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD007_220510, 0224_SD013_220510, 0224_SD014_220510, 0224_QC121_220510	**10-May-2022**	**18-May-2022**	06-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD004_220511, 0224_SD005_220511, 0224_SD008_220511, 0224_SD009_220511, 0224_SD012_220511, 0224_SD027_220511, 0224_QC125_220511	**11-May-2022**	**18-May-2022**	07-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD006_220512, 0224_SD025_220512, 0224_SD016_220512, 0224_QC127_220512	**12-May-2022**	**18-May-2022**	08-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) 0224_SD017_220509, 0224_SD018_220509, 0224_SD019_220509	**09-May-2022**	**18-May-2022**	05-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD007_220510, 0224_SD013_220510, 0224_SD014_220510, 0224_QC121_220510	**10-May-2022**	**18-May-2022**	06-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD004_220511, 0224_SD005_220511, 0224_SD008_220511, 0224_SD009_220511, 0224_SD012_220511, 0224_SD027_220511, 0224_QC125_220511	**11-May-2022**	**18-May-2022**	07-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD006_220512, 0224_SD025_220512, 0224_SD016_220512, 0224_QC127_220512	**12-May-2022**	**18-May-2022**	08-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) 0224_SD017_220509, 0224_SD018_220509, 0224_SD019_220509	**09-May-2022**	**18-May-2022**	05-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD007_220510, 0224_SD013_220510, 0224_SD014_220510, 0224_QC121_220510	**10-May-2022**	**18-May-2022**	06-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD004_220511, 0224_SD005_220511, 0224_SD008_220511, 0224_SD009_220511, 0224_SD012_220511, 0224_SD027_220511, 0224_QC125_220511	**11-May-2022**	**18-May-2022**	07-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD006_220512, 0224_SD025_220512, 0224_SD016_220512, 0224_QC127_220512	**12-May-2022**	**18-May-2022**	08-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) 0224_SD017_220509, 0224_SD018_220509, 0224_SD019_220509	**09-May-2022**	**18-May-2022**	05-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD007_220510, 0224_SD013_220510, 0224_SD014_220510, 0224_QC121_220510	**10-May-2022**	**18-May-2022**	06-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD004_220511, 0224_SD005_220511, 0224_SD008_220511, 0224_SD009_220511, 0224_SD012_220511, 0224_SD027_220511, 0224_QC125_220511	**11-May-2022**	**18-May-2022**	07-Nov-2022	✓	**24-May-2022**	27-Jun-2022	✓
HDPE Soil Jar (EP231X) 0224_SD006_220512, 0224_SD025_220512, 0224_SD016_220512, 0224_QC127_220512	**12-May-2022**	**18-May-2022**	08-Nov-2022	✓	**24-May-2022**	27-Jun-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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	18	**11.11**	**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	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

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

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

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2213573**

Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted] 4006	Address	: [redacted]
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Facsimile	: [redacted]	Facsimile	: [redacted]
Project	: QLD_0224_PFASOMP	Page	: 1 of 3
Order number	: 60612563 4.1	Quote number	: ES2020AECOMAU0024 (SY/139/19 V3_QLD)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: WBTA OMP		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-May-2022 13:00	Issue Date	: 17-May-2022
Client Requested Due Date	: 30-May-2022	Scheduled Reporting Date	: **30-May-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: -1.3°C, 3.2°C, 2.4°C, 3.5°C - Ice present
Receipt Detail	: SMALL/MEDIUM ESKY	No. of samples received / analysed	: 18 / 18

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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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 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-SUT PFAS - Super Ultra Trace Waters Long Suite (29
EB2213573-001	09-May-2022 00:00	0224_SW017_220509	✓
EB2213573-002	09-May-2022 00:00	0224_SW018_220509	✓
EB2213573-003	09-May-2022 00:00	0224_SW019_220509	✓
EB2213573-004	10-May-2022 00:00	0224_SW007_220510	✓
EB2213573-005	10-May-2022 00:00	0224_SW013_220510	✓
EB2213573-006	10-May-2022 00:00	0224_SW014_220510	✓
EB2213573-007	11-May-2022 00:00	0224_SW004_220511	✓
EB2213573-008	11-May-2022 00:00	0224_SW005_220511	✓
EB2213573-009	11-May-2022 00:00	0224_SW008_220511	✓
EB2213573-010	11-May-2022 00:00	0224_SW009_220511	✓
EB2213573-011	11-May-2022 00:00	0224_SW012_220511	✓
EB2213573-012	11-May-2022 00:00	0224_SW027_220511	✓
EB2213573-013	13-May-2022 00:00	0224_SW006_220512	✓
EB2213573-014	13-May-2022 00:00	0224_SW025_220512	✓
EB2213573-015	13-May-2022 00:00	0224_SW016_220512	✓
EB2213573-016	10-May-2022 00:00	0224_QC122_220510	✓
EB2213573-017	11-May-2022 00:00	0224_QC126_220511	✓
EB2213573-018	12-May-2022 00:00	0224_QC128_220512	✓

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	AP_CustomerService.ANZ@aecom.com

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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 - ESDAT (ESDAT)	Email	

DERP ESDAT REPORTS

- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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	
- A4 - AU Tax Invoice (INV)	Email	
- Chain of Custody (CoC) (COC)	Email	
- EDI Format - ESDAT (ESDAT)	Email	

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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 - ESDAT (ESDAT)	Email	

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2213573**	Page	: 1 of 11
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022 13:00
Order number	: 60612563 4.1	Date Analysis Commenced	: 25-May-2022
C-O-C number	: ----	Issue Date	: 27-May-2022 15:42
Sampler	: [redacted]		
Site	: WBTA OMP		
Quote number	: SY/139/19 V3_QLD		
No. of samples received	: 18		
No. of samples analysed	: 18		

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 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-SUT PFAS: Whole bottle extraction was not possible for particular samples. Samples required dilution prior to extraction due to matrix interference (high sediment content). LOR values have been adjusted accordingly. The LOR values of particular analytes for particular samples have been further raised due to additional matrix interferences.
- 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	0224_SW017_220509	0224_SW018_220509	0224_SW019_220509	0224_SW007_220510	0224_SW013_220510
				Sampling date / time	09-May-2022 00:00	09-May-2022 00:00	09-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
					EB2213573-001	EB2213573-002	EB2213573-003	EB2213573-004	EB2213573-005
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0005	<0.0008	<0.0030	<0.0016	<0.0008
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0005	<0.0008	<0.0020	<0.0016	<0.0008
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0005	<0.0008	**0.0197**	<0.0016	<0.0008
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	<0.0008	<0.0016	<0.0016	<0.0008
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0003	<0.0022	**0.0157**	<0.0016	<0.0012
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0008	<0.0016	<0.0016	<0.0008
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0020	<0.0040	<0.0080	<0.0079	<0.0041
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0005	<0.0035	<0.0016	<0.0016	<0.0008
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0005	<0.0008	<0.0016	<0.0016	<0.0008
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0005	<0.0008	<0.0030	<0.0016	<0.0008
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0005	<0.0008	<0.0016	<0.0016	<0.0008
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	<0.0008	<0.0016	<0.0016	<0.0008
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	<0.0008	<0.0016	<0.0016	<0.0008
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0008	<0.0016	<0.0016	<0.0008
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0032	<0.0008	<0.0160	<0.0016	<0.0082
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0032	<0.0008	<0.0160	<0.0016	<0.0082
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0080	<0.0020	<0.0400	<0.0394	<0.0205
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0008	<0.0016	<0.0016	<0.0008
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.008	<0.002	<0.040	<0.004	<0.020
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.008	<0.002	<0.040	<0.004	<0.020

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0224_SW017_220509	0224_SW018_220509	0224_SW019_220509	0224_SW007_220510	0224_SW013_220510
				Sampling date / time	09-May-2022 00:00	09-May-2022 00:00	09-May-2022 00:00	10-May-2022 00:00	10-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213573-001	EB2213573-002	EB2213573-003	EB2213573-004	EB2213573-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.008	<0.002	<0.040	<0.004	<0.020
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.008	<0.002	<0.040	<0.004	<0.020
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0008	<0.0016	<0.0016	<0.0008
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0008	<0.0016	<0.0016	<0.0008
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.002	<0.002	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	<0.002	<0.002	<0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.002	<0.002	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.002	<0.002	<0.001
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0003	<0.0008	**0.0354**	<0.0016	<0.0008
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0003	<0.0008	**0.0354**	<0.0016	<0.0008
^ Sum of PFAS	----	0.0002	µg/L		<0.0032	<0.0008	**0.0354**	<0.0158	<0.0082
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**80.4**	**85.2**	**85.1**	**94.2**	**93.8**
13C8-PFOA	----	0.0005	%		**90.6**	**87.9**	**88.8**	**88.5**	**83.7**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	0224_SW014_220510	0224_SW004_220511	0224_SW005_220511	0224_SW008_220511	0224_SW009_220511
				Sampling date / time	10-May-2022 00:00	11-May-2022 00:00	11-May-2022 00:00	11-May-2022 00:00	11-May-2022 00:00
					EB2213573-006	EB2213573-007	EB2213573-008	EB2213573-009	EB2213573-010
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0018	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0081	<0.0079	<0.0081	<0.0079	<0.0079
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0162	<0.0157	<0.0162	<0.0016	<0.0016
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0162	<0.0157	<0.0162	<0.0016	<0.0016
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0404	<0.0393	<0.0404	<0.0397	<0.0395
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.040	<0.039	<0.040	<0.040	<0.004
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.040	<0.039	<0.040	<0.040	<0.004

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0224_SW014_220510	0224_SW004_220511	0224_SW005_220511	0224_SW008_220511	0224_SW009_220511
				Sampling date / time	10-May-2022 00:00	11-May-2022 00:00	11-May-2022 00:00	11-May-2022 00:00	11-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213573-006	EB2213573-007	EB2213573-008	EB2213573-009	EB2213573-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.039	<0.040	<0.004	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.040	<0.039	<0.040	<0.040	<0.004
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0016	<0.0016	<0.0016	<0.0016	<0.0016
^ Sum of PFAS	----	0.0002	µg/L		<0.0162	<0.0157	<0.0162	<0.0159	<0.0158
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**84.3**	**90.3**	**77.6**	**85.7**	**86.7**
13C8-PFOA	----	0.0005	%		**89.1**	**91.7**	**87.8**	**92.6**	**87.6**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	0224_SW012_220511	0224_SW027_220511	0224_SW006_220512	0224_SW025_220512	0224_SW016_220512
				Sampling date / time	11-May-2022 00:00	11-May-2022 00:00	13-May-2022 00:00	13-May-2022 00:00	13-May-2022 00:00
					EB2213573-011	EB2213573-012	EB2213573-013	EB2213573-014	EB2213573-015
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0016	<0.0040	<0.0016	<0.0016	<0.0016
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0016	<0.0112	<0.0016	<0.0026	<0.0016
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0079	<0.0151	<0.0082	<0.0081	<0.0081
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0163	<0.0016
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0163	<0.0163
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0163	<0.0163
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0397	<0.0076	<0.0410	<0.0406	<0.0407
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.040	<0.008	<0.004	<0.041	<0.041
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.040	<0.008	<0.004	<0.041	<0.041

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0224_SW012_220511	0224_SW027_220511	0224_SW006_220512	0224_SW025_220512	0224_SW016_220512
				Sampling date / time	11-May-2022 00:00	11-May-2022 00:00	13-May-2022 00:00	13-May-2022 00:00	13-May-2022 00:00
Compound	CAS Number	LOR	Unit		EB2213573-011	EB2213573-012	EB2213573-013	EB2213573-014	EB2213573-015
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.004	<0.008	<0.004	<0.041	<0.004
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.040	<0.008	<0.004	<0.041	<0.041
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.002	<0.003	<0.002	<0.002	<0.002
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.002	<0.003	<0.002	<0.002	<0.002
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.002	<0.003	<0.002	<0.002	<0.002
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.002	<0.003	<0.002	<0.002	<0.002
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0016	<0.0030	<0.0016	<0.0016	<0.0016
^ Sum of PFAS	----	0.0002	µg/L		<0.0159	<0.0030	<0.0164	<0.0163	<0.0163
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**86.5**	**92.9**	**84.2**	**88.8**	**89.5**
13C8-PFOA	----	0.0005	%		**89.2**	**90.2**	**86.5**	**86.7**	**87.2**

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0224_QC122_220510	0224_QC126_220511	0224_QC128_220512	----	----
				Sampling date / time	10-May-2022 00:00	11-May-2022 00:00	12-May-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2213573-016	EB2213573-017	EB2213573-018	--------	--------
					Result	Result	Result	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0008	<0.0031	<0.0016	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0008	<0.0031	<0.0016	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0008	<0.0035	<0.0016	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0008	<0.0031	<0.0016	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0012	<0.0100	<0.0016	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0008	<0.0031	<0.0016	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0040	<0.0153	<0.0082	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0008	<0.0031	<0.0016	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0008	<0.0031	<0.0016	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0008	<0.0031	<0.0016	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0008	<0.0031	<0.0016	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0008	<0.0031	<0.0016	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0008	<0.0031	<0.0016	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0008	<0.0031	<0.0016	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0080	<0.0031	<0.0016	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0080	<0.0031	<0.0016	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0200	<0.0076	<0.0412	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0008	<0.0031	<0.0016	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.020	<0.008	<0.041	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.020	<0.008	<0.041	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0224_QC122_220510	0224_QC126_220511	0224_QC128_220512	----	----
				Sampling date / time	10-May-2022 00:00	11-May-2022 00:00	12-May-2022 00:00	----	----
Compound	CAS Number	LOR	Unit		EB2213573-016	EB2213573-017	EB2213573-018	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.020	<0.008	<0.004	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.020	<0.008	<0.004	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0008	<0.0031	<0.0016	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0008	<0.0031	<0.0016	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.003	<0.002	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.003	<0.002	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.003	<0.002	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.003	<0.002	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0008	<0.0031	<0.0016	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0008	<0.0031	<0.0016	----	----
^ Sum of PFAS	----	0.0002	µg/L		<0.0080	<0.0031	<0.0165	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**81.7**	**86.6**	**74.0**	----	----
13C8-PFOA	----	0.0005	%		**90.0**	**91.9**	**92.4**	----	----

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	: **EB2213573**	Page	: 1 of 4
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022
Order number	: 60612563 4.1	Date Analysis Commenced	: 25-May-2022
C-O-C number	: ----	Issue Date	: 27-May-2022
Sampler	: [redacted]		
Site	: WBTA OMP		
Quote number	: SY/139/19 V3_QLD		
No. of samples received	: 18		
No. of samples analysed	: 18		

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]	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%.

- **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: 4344117)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	105	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	103	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	111	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	121	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	113	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	95.6	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4344117)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	111	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	102	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	117	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	106	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	119	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	101	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	96.0	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	104	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	112	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	105	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	110	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4344117)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	116	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	130	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	127	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	110	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	122	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	99.6	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	105	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4344117)								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	101	63.0	143

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: 4344117) - continued								
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	115	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	116	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	108	53.1	133
EP231P: PFAS Sums (QCLot: 4344117)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

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

- **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	: **EB2213573**	Page	: 1 of 6
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022
Site	: WBTA OMP	Issue Date	: 27-May-2022
Sampler	: [redacted]	No. of samples received	: 18
Order number	: 60612563 4.1	No. of samples analysed	: 18

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-SUT) 0224_SW017_220509, 0224_SW018_220509, 0224_SW019_220509	**09-May-2022**	**25-May-2022**	05-Nov-2022	✓	**25-May-2022**	05-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW007_220510, 0224_SW013_220510, 0224_SW014_220510, 0224_QC122_220510	**10-May-2022**	**25-May-2022**	06-Nov-2022	✓	**25-May-2022**	06-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW004_220511, 0224_SW005_220511, 0224_SW008_220511, 0224_SW009_220511, 0224_SW012_220511, 0224_SW027_220511, 0224_QC126_220511	**11-May-2022**	**25-May-2022**	07-Nov-2022	✓	**25-May-2022**	07-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_QC128_220512	**12-May-2022**	**25-May-2022**	08-Nov-2022	✓	**25-May-2022**	08-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW006_220512, 0224_SW025_220512, 0224_SW016_220512	**13-May-2022**	**25-May-2022**	09-Nov-2022	✓	**25-May-2022**	09-Nov-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-SUT) 0224_SW017_220509, 0224_SW018_220509, 0224_SW019_220509	**09-May-2022**	**25-May-2022**	05-Nov-2022	✓	**25-May-2022**	05-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW007_220510, 0224_SW013_220510, 0224_SW014_220510, 0224_QC122_220510	**10-May-2022**	**25-May-2022**	06-Nov-2022	✓	**25-May-2022**	06-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW004_220511, 0224_SW005_220511, 0224_SW008_220511, 0224_SW009_220511, 0224_SW012_220511, 0224_SW027_220511, 0224_QC126_220511	**11-May-2022**	**25-May-2022**	07-Nov-2022	✓	**25-May-2022**	07-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_QC128_220512	**12-May-2022**	**25-May-2022**	08-Nov-2022	✓	**25-May-2022**	08-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW006_220512, 0224_SW025_220512, 0224_SW016_220512	**13-May-2022**	**25-May-2022**	09-Nov-2022	✓	**25-May-2022**	09-Nov-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT) 0224_SW017_220509, 0224_SW018_220509, 0224_SW019_220509	**09-May-2022**	**25-May-2022**	05-Nov-2022	✓	**25-May-2022**	05-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW007_220510, 0224_SW013_220510, 0224_SW014_220510, 0224_QC122_220510	**10-May-2022**	**25-May-2022**	06-Nov-2022	✓	**25-May-2022**	06-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW004_220511, 0224_SW005_220511, 0224_SW008_220511, 0224_SW009_220511, 0224_SW012_220511, 0224_SW027_220511, 0224_QC126_220511	**11-May-2022**	**25-May-2022**	07-Nov-2022	✓	**25-May-2022**	07-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_QC128_220512	**12-May-2022**	**25-May-2022**	08-Nov-2022	✓	**25-May-2022**	08-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW006_220512, 0224_SW025_220512, 0224_SW016_220512	**13-May-2022**	**25-May-2022**	09-Nov-2022	✓	**25-May-2022**	09-Nov-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-SUT) 0224_SW017_220509, 0224_SW018_220509, 0224_SW019_220509	**09-May-2022**	**25-May-2022**	05-Nov-2022	✓	**25-May-2022**	05-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW007_220510, 0224_SW013_220510, 0224_SW014_220510, 0224_QC122_220510	**10-May-2022**	**25-May-2022**	06-Nov-2022	✓	**25-May-2022**	06-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW004_220511, 0224_SW005_220511, 0224_SW008_220511, 0224_SW009_220511, 0224_SW012_220511, 0224_SW027_220511, 0224_QC126_220511	**11-May-2022**	**25-May-2022**	07-Nov-2022	✓	**25-May-2022**	07-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_QC128_220512	**12-May-2022**	**25-May-2022**	08-Nov-2022	✓	**25-May-2022**	08-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW006_220512, 0224_SW025_220512, 0224_SW016_220512	**13-May-2022**	**25-May-2022**	09-Nov-2022	✓	**25-May-2022**	09-Nov-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT) 0224_SW017_220509, 0224_SW018_220509, 0224_SW019_220509	**09-May-2022**	**25-May-2022**	05-Nov-2022	✓	**25-May-2022**	05-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW007_220510, 0224_SW013_220510, 0224_SW014_220510, 0224_QC122_220510	**10-May-2022**	**25-May-2022**	06-Nov-2022	✓	**25-May-2022**	06-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW004_220511, 0224_SW005_220511, 0224_SW008_220511, 0224_SW009_220511, 0224_SW012_220511, 0224_SW027_220511, 0224_QC126_220511	**11-May-2022**	**25-May-2022**	07-Nov-2022	✓	**25-May-2022**	07-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_QC128_220512	**12-May-2022**	**25-May-2022**	08-Nov-2022	✓	**25-May-2022**	08-Nov-2022	✓
HDPE (no PTFE) (EP231X-SUT) 0224_SW006_220512, 0224_SW025_220512, 0224_SW016_220512	**13-May-2022**	**25-May-2022**	09-Nov-2022	✓	**25-May-2022**	09-Nov-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-SUT	0	18	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	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-SUT	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 concentrated, combined with an equal volume of 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
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 : **EB2213615**

Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: BRISBANE	Address	: [redacted]
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Facsimile	: [redacted]	Facsimile	: [redacted]
Project	: QLD_0224_PFASOMP	Page	: 1 of 3
Order number	: 60612563 4.1	Quote number	: ES2020AECOMAU0024 (SY/139/19 V3_QLD)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: WBTA OMP		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-May-2022 13:00	Issue Date	: 17-May-2022
Client Requested Due Date	: 26-May-2022	Scheduled Reporting Date	: **26-May-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: -1.3, 3.2°C, 3.5°C, 2.4°C - Ice present
Receipt Detail	: HARD ESKIES	No. of samples received / analysed	: 2 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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 Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EB2213615-002	13-May-2022 00:00	0224_SD021_220513	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29
EB2213615-001	13-May-2022 00:00	0224_SW021_220513	✓

Proactive Holding Time Report

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

Requested Deliverables

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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 - ESDAT (ESDAT)	Email	

DERP ESDAT REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	derp.labreports@esdat.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	derp.labreports@esdat.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	derp.labreports@esdat.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	derp.labreports@esdat.com.au
- Chain of Custody (CoC) (COC)	Email	derp.labreports@esdat.com.au
- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au

[redacted]

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

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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 - ESDAT (ESDAT)	Email	

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2213615**	Page	: 1 of 7
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: BRISBANE	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022 13:00
Order number	: 60612563 4.1	Date Analysis Commenced	: 18-May-2022
C-O-C number	: ----	Issue Date	: 25-May-2022 16:25
Sampler	: [redacted]		
Site	: WBTA OMP		
Quote number	: SY/139/19 V3_QLD		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	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 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 PFAS: Sample "0224_SD021_220513" required dilution due to matrix interferences. LOR values have been adjusted accordingly.
- EP231X PFAS: The LORs of NMeFOSA and PFOS for sample '0224_SD021_220513' (EB2213615-002) have been raised due to sample matrix interferences.
- EP231X-SUT PFAS: Whole bottle extraction was not possible for sample "0224_SW021_220513". Sample required dilution prior to extraction due to matrix interference (high sediment content). LOR values have been adjusted accordingly. The LOR values of PFOS & PFOA have been further raised due to additional matrix interferences.
- 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: SOIL (Matrix: SOIL)				Sample ID	0224_SD021_220513	----	----	----	----
				Sampling date / time	13-May-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2213615-002	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**32.1**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0006	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0006	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0224_SD021_220513	----	----	----	----
				Sampling date / time	13-May-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2213615-002	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0006	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0006	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0006	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**95.0**	----	----	----	----
13C8-PFOA	----	0.0002	%		**108**	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0224_SW021_220513	----	----	----	----
				Sampling date / time	13-May-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2213615-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0008	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0008	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0008	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0008	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0012	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0008	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0040	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0008	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0008	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0008	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0015	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0008	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0008	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0008	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0008	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0008	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0200	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0008	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.020	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.020	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0224_SW021_220513	----	----	----	----
				Sampling date / time	13-May-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2213615-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.002	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0008	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0008	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	----	----	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0008	----	----	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0008	----	----	----	----
^ Sum of PFAS	----	0.0002	µg/L		<0.0080	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**93.7**	----	----	----	----
13C8-PFOA	----	0.0005	%		**91.7**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

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	: **EB2213615**	Page	: 1 of 7
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: BRISBANE	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022
Order number	: 60612563 4.1	Date Analysis Commenced	: 18-May-2022
C-O-C number	: ----	Issue Date	: 25-May-2022
Sampler	: [redacted]		
Site	: WBTA OMP		
Quote number	: SY/139/19 V3_QLD		
No. of samples received	: 2		
No. of samples analysed	: 2		

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]	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4345875)									
EB2213479-001	Anonymous	EA055: Moisture Content	----	0.1	%	19.3	20.2	4.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4344804)									
EB2213479-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4344804)									
EB2213479-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0006	<0.0006	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4344804)									
EB2213479-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4344804) - continued									
EB2213479-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4344804)									
EB2213479-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4344804)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	114	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	115	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	109	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	109	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	100	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	113	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4344804)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	95.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4344804)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4344804)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	91.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	117	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	90.0	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4344804) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	122	54.8	124

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: 4344114)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	109	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	122	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	127	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	120	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	108	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	106	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4344114)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	120	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	99.6	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	113	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	119	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	130	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	121	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	107	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	86.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	75.2	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	91.2	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	71.5	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4344114)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	109	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	127	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	132	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	121	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	132	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	116	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	113	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4344114)								

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: 4344114) - continued								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	130	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	133	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	112	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	133	53.1	133
EP231P: PFAS Sums (QCLot: 4344114)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4344804)							
EB2213479-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	116	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	120	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	114	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	118	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	116	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4344804)							
EB2213479-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	102	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	96.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	92.4	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	99.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	108	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	96.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	92.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	90.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	98.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	96.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	113	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4344804)							
EB2213479-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	101	48.0	128

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4344804) - continued							
EB2213479-002	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	104	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	112	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	102	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	122	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	106	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	96.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4344804)							
EB2213479-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	96.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	90.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	81.0	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	119	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2213615**	Page	: 1 of 5
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022
Site	: WBTA OMP	Issue Date	: 25-May-2022
Sampler	: [redacted]	No. of samples received	: 2
Order number	: 60612563 4.1	No. of samples analysed	: 2

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0224_SD021_220513	**13-May-2022**	**----**	----	----	**18-May-2022**	27-May-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0224_SD021_220513	**13-May-2022**	**18-May-2022**	09-Nov-2022	✓	**20-May-2022**	27-Jun-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0224_SD021_220513	**13-May-2022**	**18-May-2022**	09-Nov-2022	✓	**20-May-2022**	27-Jun-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0224_SD021_220513	**13-May-2022**	**18-May-2022**	09-Nov-2022	✓	**20-May-2022**	27-Jun-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0224_SD021_220513	**13-May-2022**	**18-May-2022**	09-Nov-2022	✓	**20-May-2022**	27-Jun-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0224_SD021_220513	**13-May-2022**	**18-May-2022**	09-Nov-2022	✓	**20-May-2022**	27-Jun-2022	✓

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

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-SUT)							
0224_SW021_220513	**13-May-2022**	**24-May-2022**	09-Nov-2022	✓	**24-May-2022**	09-Nov-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-SUT)							
0224_SW021_220513	**13-May-2022**	**24-May-2022**	09-Nov-2022	✓	**24-May-2022**	09-Nov-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-SUT)							
0224_SW021_220513	**13-May-2022**	**24-May-2022**	09-Nov-2022	✓	**24-May-2022**	09-Nov-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-SUT)							
0224_SW021_220513	**13-May-2022**	**24-May-2022**	09-Nov-2022	✓	**24-May-2022**	09-Nov-2022	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-SUT)							
0224_SW021_220513	**13-May-2022**	**24-May-2022**	09-Nov-2022	✓	**24-May-2022**	09-Nov-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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	**11.11**	**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-SUT	0	3	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	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 concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

Preparation Methods	Method	Matrix	Method Descriptions
QuECheRS Extraction of Solids	ORG71	SOIL	In house: Sequential extractions with Acetonitrile/Methanol by shaking. Extraction efficiency aided by the addition of salts under acidic conditions. Where relevant, interferences from co-extracted organics are removed with dispersive clean-up media (dSPE). The extract is either diluted or concentrated and exchanged into the analytical solvent.
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	: **EB2213618**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: BRISBANE	Address	: [redacted]
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: QLD_0224_PFASOMP	Page	: 1 of 3
Order number	: 60612563 4.1	Quote number	: ES2020AECOMAU0024 (SY/139/19 V3_QLD)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: WBTA OMP		
Sampler	: [redacted]		

Dates

Date Samples Received	: 13-May-2022 13:00	Issue Date	: 17-May-2022
Client Requested Due Date	: 26-May-2022	Scheduled Reporting Date	: **26-May-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 4	Temperature	: -1.3, 3.2°C, 2.4°C, 3.5°C - Ice present
Receipt Detail	: HARD ESKIES	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please be advised that QC samples were forwarded to NMI as directed to via Chain of Custody. Please note this will incur a freight forwarding fee
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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 Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EB2213618-003	12-May-2022 00:00	0224_SD022_220512	✓	✓
EB2213618-004	12-May-2022 00:00	0224_SD023_220512	✓	✓

Matrix: **WATER**

Laboratory sample ID	Sampling date / time	Sample ID	WATER - EP231X-SUT PFAS - Super Ultra Trace Waters Long Suite (29
EB2213618-001	12-May-2022 00:00	0224_SW022_220512	✓
EB2213618-002	12-May-2022 00:00	0224_SW023_220512	✓

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	AP_CustomerService.ANZ@aecom.com

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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 - ESDAT (ESDAT)	Email	

DERP ESDAT REPORTS

- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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	
- A4 - AU Tax Invoice (INV)	Email	
- Chain of Custody (CoC) (COC)	Email	
- EDI Format - ESDAT (ESDAT)	Email	

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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 - ESDAT (ESDAT)	Email	

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2213618**	Page	: 1 of 7
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: BRISBANE	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022 13:00
Order number	: 60612563 4.1	Date Analysis Commenced	: 18-May-2022
C-O-C number	: ----	Issue Date	: 25-May-2022 16:19
Sampler	: [redacted]		
Site	: WBTA OMP		
Quote number	: SY/139/19 V3_QLD		
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]	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	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 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 PFAS: Sample "0224_SD023_220512" required dilution due to matrix interferences. LOR values have been adjusted accordingly.
- EP231X PFAS: The LORs of NEtFOSA and PFOS for sample '0224_SD023_220512' (EB2213618-004) have been raised due to sample matrix interferences.
- EP231X-SUT PFAS: Whole bottle extraction was not possible for samples "0224_SW022_220512" & "0224_SW023_220512". Samples required dilution prior to extraction due to matrix interference (high sediment content). LOR values have been adjusted accordingly.
- EP231X-SUT PFAS: The LOR values of PFHxS & PFOS for sample "0224_SW022_220512" and PFBA for sample "0224_SW023_220512" have been raised due to matrix interferences.
- 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: SOIL (Matrix: SOIL)				Sample ID	0224_SD022_220512	0224_SD023_220512	----	----	----
				Sampling date / time	12-May-2022 00:00	12-May-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2213618-003	EB2213618-004	--------	--------	--------
					Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**18.1**	**41.4**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0006	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0006	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	0224_SD022_220512	0224_SD023_220512	----	----	----
				Sampling date / time	12-May-2022 00:00	12-May-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2213618-003	EB2213618-004	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0006	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0006	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0006	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**104**	**128**	----	----	----
13C8-PFOA	----	0.0002	%		**97.0**	**95.0**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0224_SW022_220512	0224_SW023_220512	----	----	----
				Sampling date / time	12-May-2022 00:00	12-May-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2213618-001	EB2213618-002	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		<0.0008	<0.0008	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		<0.0008	<0.0008	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		<0.0015	**0.0074**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0008	<0.0008	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L		<0.0012	**0.0043**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0008	<0.0008	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.0020	µg/L		<0.0040	<0.0060	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		<0.0008	<0.0008	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		<0.0008	<0.0008	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		<0.0008	<0.0008	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		<0.0008	<0.0008	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0008	<0.0008	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0008	<0.0008	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0008	<0.0008	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0008	<0.0008	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L		<0.0008	<0.0008	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0200	<0.0200	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0008	<0.0008	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.020	<0.020	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.020	<0.020	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	0224_SW022_220512	0224_SW023_220512	----	----	----
				Sampling date / time	12-May-2022 00:00	12-May-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2213618-001	EB2213618-002	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.020	<0.020	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.020	<0.020	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0008	<0.0008	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0008	<0.0008	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	<0.001	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	----	----	----
EP231P: PFAS Sums									
^ Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	µg/L		<0.0008	**0.0117**	----	----	----
^ Sum of PFAS (WA DER List)	----	0.0002	µg/L		<0.0008	**0.0117**	----	----	----
^ Sum of PFAS	----	0.0002	µg/L		<0.0080	**0.0117**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		**93.8**	**104**	----	----	----
13C8-PFOA	----	0.0005	%		**84.6**	**109**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	76	136
13C8-PFOA	----	78	131

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	: **EB2213618**	Page	: 1 of 7
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: BRISBANE	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022
Order number	: 60612563 4.1	Date Analysis Commenced	: 18-May-2022
C-O-C number	: ----	Issue Date	: 25-May-2022
Sampler	: [redacted]		
Site	: WBTA OMP		
Quote number	: SY/139/19 V3_QLD		
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]	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	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: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4345875)									
EB2213479-001	Anonymous	EA055: Moisture Content	----	0.1	%	19.3	20.2	4.7	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4344804)									
EB2213479-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4344804)									
EB2213479-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0006	<0.0006	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4344804)									
EB2213479-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4344804) - continued									
EB2213479-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4344804)									
EB2213479-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4344804)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.0011 mg/kg	114	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00117 mg/kg	115	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	109	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	109	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	100	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.0012 mg/kg	113	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4344804)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	95.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	114	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4344804)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	112	59.6	143
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	62.8	140
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	61.5	139
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	108	61.9	137
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4344804)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	91.4	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00118 mg/kg	117	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.0012 mg/kg	90.0	65.0	137

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4344804) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.0012 mg/kg	122	54.8	124

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: 4344114)								
EP231X-SUT: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.00355 µg/L	109	72.0	130
EP231X-SUT: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.00376 µg/L	122	71.0	127
EP231X-SUT: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.00379 µg/L	127	68.0	131
EP231X-SUT: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.00381 µg/L	120	69.0	134
EP231X-SUT: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	µg/L	<0.0002	0.00371 µg/L	108	65.0	140
EP231X-SUT: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.00385 µg/L	106	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4344114)								
EP231X-SUT: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.0020	0.02 µg/L	120	73.0	129
EP231X-SUT: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.004 µg/L	99.6	72.0	129
EP231X-SUT: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.004 µg/L	113	72.0	129
EP231X-SUT: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.004 µg/L	119	72.0	130
EP231X-SUT: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.004 µg/L	130	71.0	133
EP231X-SUT: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.004 µg/L	121	69.0	130
EP231X-SUT: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.004 µg/L	107	71.0	129
EP231X-SUT: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	86.8	69.0	133
EP231X-SUT: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.004 µg/L	75.2	72.0	134
EP231X-SUT: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.004 µg/L	91.2	65.0	144
EP231X-SUT: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.01 µg/L	71.5	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4344114)								
EP231X-SUT: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.004 µg/L	109	67.0	137
EP231X-SUT: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.01 µg/L	127	68.0	141
EP231X-SUT: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.01 µg/L	132	57.9	141
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.01 µg/L	121	63.3	134
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.01 µg/L	132	60.0	136
EP231X-SUT: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.004 µg/L	116	65.0	136
EP231X-SUT: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.004 µg/L	113	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4344114)								

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: 4344114) - continued								
EP231X-SUT: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.00374 µg/L	130	63.0	143
EP231X-SUT: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.0038 µg/L	133	64.0	140
EP231X-SUT: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.00384 µg/L	112	67.0	138
EP231X-SUT: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.00386 µg/L	133	53.1	133
EP231P: PFAS Sums (QCLot: 4344114)								
EP231X-SUT: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS (WA DER List)	----	0.0002	µg/L	<0.0002	----	----	----	----
EP231X-SUT: Sum of PFAS	----	0.0002	µg/L	<0.0002	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4344804)							
EB2213479-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0011 mg/kg	116	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00117 mg/kg	120	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00118 mg/kg	114	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	118	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	116	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0012 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4344804)							
EB2213479-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	102	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	96.0	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	92.4	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	99.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	108	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	96.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	92.8	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	90.8	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	98.8	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	96.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	113	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4344804)							
EB2213479-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	101	48.0	128

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4344804) - continued							
EB2213479-002	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	104	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	112	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	102	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	122	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	106	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	96.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4344804)							
EB2213479-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	96.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00118 mg/kg	90.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	81.0	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0012 mg/kg	119	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2213618**	Page	: 1 of 5
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 13-May-2022
Site	: WBTA OMP	Issue Date	: 25-May-2022
Sampler	: [redacted]	No. of samples received	: 4
Order number	: 60612563 4.1	No. of samples analysed	: 4

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

- **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: **SOIL**

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
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
0224_SD022_220512, 0224_SD023_220512	**12-May-2022**	**----**	----	----	**18-May-2022**	26-May-2022	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0224_SD022_220512, 0224_SD023_220512	**12-May-2022**	**18-May-2022**	08-Nov-2022	✓	**20-May-2022**	27-Jun-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
0224_SD022_220512, 0224_SD023_220512	**12-May-2022**	**18-May-2022**	08-Nov-2022	✓	**20-May-2022**	27-Jun-2022	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
0224_SD022_220512, 0224_SD023_220512	**12-May-2022**	**18-May-2022**	08-Nov-2022	✓	**20-May-2022**	27-Jun-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
0224_SD022_220512, 0224_SD023_220512	**12-May-2022**	**18-May-2022**	08-Nov-2022	✓	**20-May-2022**	27-Jun-2022	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
0224_SD022_220512, 0224_SD023_220512	**12-May-2022**	**18-May-2022**	08-Nov-2022	✓	**20-May-2022**	27-Jun-2022	✓

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-SUT)								
0224_SW022_220512,	0224_SW023_220512	**12-May-2022**	**24-May-2022**	08-Nov-2022	✓	**24-May-2022**	08-Nov-2022	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X-SUT)								
0224_SW022_220512,	0224_SW023_220512	**12-May-2022**	**24-May-2022**	08-Nov-2022	✓	**24-May-2022**	08-Nov-2022	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X-SUT)								
0224_SW022_220512,	0224_SW023_220512	**12-May-2022**	**24-May-2022**	08-Nov-2022	✓	**24-May-2022**	08-Nov-2022	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X-SUT)								
0224_SW022_220512,	0224_SW023_220512	**12-May-2022**	**24-May-2022**	08-Nov-2022	✓	**24-May-2022**	08-Nov-2022	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X-SUT)								
0224_SW022_220512,	0224_SW023_220512	**12-May-2022**	**24-May-2022**	08-Nov-2022	✓	**24-May-2022**	08-Nov-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: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	9	**11.11**	**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-SUT	0	3	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	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
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-house: Analysis of soils by solvent extraction followed by LC-Electrospray-MS-MS, Negative Mode using MRM using internal standard quantitation. Isotopically labelled analogues of target analytes used as internal standards and surrogates are added to a portion of soil which is then extracted with MTBE and an ion pairing reagent. A portion of extract is exchanged into the analytical solvent mixture, combined with an equal volume reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-SUT	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 concentrated, combined with an equal volume of reagent water and filtered for analysis. Method procedures and data quality objectives conform to US DoD QSM 5.3, table B-15 requirements.

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

Address: [redacted]

Email: [redacted]

Telephone:

Fax:

LABORATORY DETAILS

Lab: National Measurement Institute

Contact: [redacted]

Address: [redacted]

Email: [redacted]

Telephone: [redacted]

Fax:

SAMPLE DETAILS

NMI Job Name: AECO06/220517

Total No. of Samples: 9

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N22/009534	26-MAY-2022	0224_QC221_220510	SOIL 10/5/22
N22/009535	26-MAY-2022	0224_QC222_220510	WATER 10/5/22
N22/009536	26-MAY-2022	0224_QC224_220510	WATER 10/5/22
N22/009537	26-MAY-2022	0224_QC223_220511	WATER11/5/22
N22/009538	26-MAY-2022	0224_QC225_220511	SOIL 11/5/22
N22/009539	26-MAY-2022	0224_QC226_220511	WATER 11/5/22
N22/009540	26-MAY-2022	0224_QC227_220512	SOIL 12/5/22
N22/009541	26-MAY-2022	0224_QC228_220512	WATER 12/5/22
N22/009542	26-MAY-2022	0224_QC229_220512	WATER 12/5/22

SAMPLE RECEIVED CONDITION

Date samples received:	17-MAY-2022
Sample received in good order:	Yes
NMI Quotation no. provided:	
Client purchase order number:	60612563
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. RN1352955

Client	: AECOM AUSTRALIA PTY LTD	**Job No.**	: AECO06/220517
	[redacted]	**Quote No.**	: QT-02018
	[redacted]	**Order No.**	: 60612563
		Date Received	: 17-MAY-2022
Attention	: [redacted]	**Sampled By**	: CLIENT
Project Name	: WBTA OMP		
Your Client Services Manager	: [redacted]	**Phone**	: [redacted]

Lab Reg No.	Sample Ref	Sample Description
N22/009534	0224_QC221_220510	SOIL 10/5/22
N22/009538	0224_QC225_220511	SOIL 11/5/22
N22/009540	0224_QC227_220512	SOIL 12/5/22

Lab Reg No.		N22/009534	N22/009538	N22/009540		
Date Sampled		10-MAY-2022	11-MAY-2022	12-MAY-2022		
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	mg/kg	<0.002	<0.002	<0.002		NR70
PFPeA (2706-90-3)	mg/kg	<0.002	<0.002	<0.002		NR70
PFHxA (307-24-4)	mg/kg	<0.001	<0.001	<0.001		NR70
PFHpA (375-85-9)	mg/kg	<0.001	<0.001	<0.001		NR70
PFOA (335-67-1)	mg/kg	<0.001	<0.001	<0.001		NR70
PFNA (375-95-1)	mg/kg	<0.001	<0.001	<0.001		NR70
PFDA (335-76-2)	mg/kg	<0.001	<0.001	<0.001		NR70
PFUdA (2058-94-8)	mg/kg	<0.002	<0.002	<0.002		NR70
PFDoA (307-55-1)	mg/kg	<0.002	<0.002	<0.002		NR70
PFTrDA (72629-94-8)	mg/kg	<0.002	<0.002	<0.002		NR70
PFTeDA (376-06-7)	mg/kg	<0.002	<0.002	<0.002		NR70
PFHxDA (67905-19-5)	mg/kg	<0.002	<0.002	<0.002		NR70
PFODA (16517-11-6)	mg/kg	<0.005	<0.005	<0.005		NR70
FOUEA (70887-84-2)	mg/kg	<0.001	<0.001	<0.001		NR70
PFBS (375-73-5)	mg/kg	<0.001	<0.001	<0.001		NR70
PFPeS (2706-91-4)	mg/kg	<0.001	<0.001	<0.001		NR70
PFHxS (355-46-4)	mg/kg	<0.001	<0.001	<0.001		NR70
PFHpS (375-92-8)	mg/kg	<0.001	<0.001	<0.001		NR70
PFOS (1763-23-1)	mg/kg	<0.002	<0.002	<0.002		NR70
PFNS (68259-12-1)	mg/kg	<0.001	<0.001	<0.001		NR70
PFDS (335-77-3)	mg/kg	<0.001	<0.001	<0.001		NR70
PFOSA (754-91-6)	mg/kg	<0.001	<0.001	<0.001		NR70
N-MeFOSA (31506-32-8)	mg/kg	<0.002	<0.002	<0.002		NR70
N-EtFOSA (4151-50-2)	mg/kg	<0.002	<0.002	<0.002		NR70
N-MeFOSAA (2355-31-9)	mg/kg	<0.002	<0.002	<0.002		NR70
N-EtFOSAA(2991-50-6)	mg/kg	<0.002	<0.002	<0.002		NR70
N-MeFOSE (24448-09-7)	mg/kg	<0.005	<0.005	<0.005		NR70
N-EtFOSE (1691-99-2)	mg/kg	<0.005	<0.005	<0.005		NR70

REPORT OF ANALYSIS

Lab Reg No.		N22/009534	N22/009538	N22/009540		
Date Sampled		10-MAY-2022	11-MAY-2022	12-MAY-2022		
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
4:2 FTS (757124-72-4)	mg/kg	<0.001	<0.001	<0.001		NR70
6:2 FTS (27619-97-2)	mg/kg	<0.001	<0.001	<0.001		NR70
8:2 FTS (39108-34-4)	mg/kg	<0.001	<0.001	<0.001		NR70
10:2 FTS (120226-60-0)	mg/kg	<0.002	<0.002	<0.002		NR70
8:2 diPAP (678-41-1)	mg/kg	<0.002	<0.002	<0.002		NR70
PFBA (Surrogate Recovery)	%	125	136	133		NR70
PFPeA (Surrogate Recovery)	%	122	137	125		NR70
PFHxA (Surrogate Recovery)	%	142	150	139		NR70
PFHpA (Surrogate Recovery)	%	131	136	128		NR70
PFOA (Surrogate Recovery)	%	130	132	136		NR70
PFNA (Surrogate Recovery)	%	123	108	134		NR70
PFDA (Surrogate Recovery)	%	138	148	142		NR70
PFUdA (Surrogate Recovery)	%	128	137	134		NR70
PFDoA (Surrogate Recovery)	%	124	140	126		NR70
PFTeDA (Surrogate Recovery)	%	132	128	132		NR70
PFHxDA (Surrogate Recovery)	%	132	118	144		NR70
FOUEA (Surrogate Recovery)	%	63	65	53		NR70
PFBS (Surrogate Recovery)	%	138	133	128		NR70
PFHxS (Surrogate Recovery)	%	126	127	143		NR70
PFOS (Surrogate Recovery)	%	127	129	139		NR70
PFOSA (Surrogate Recovery)	%	128	126	131		NR70
N-MeFOSA (Surrogate Recovery)	%	128	126	136		NR70
N-EtFOSA (Surrogate Recovery)	%	129	119	137		NR70
N-MeFOSAA (Surrogate Recovery)	%	122	130	127		NR70
N-EtFOSAA (Surrogate Recovery)	%	120	138	130		NR70
N-MeFOSE (Surrogate Recovery)	%	125	121	125		NR70
N-EtFOSE (Surrogate Recovery)	%	152	146	152		NR70
4:2 FTS (Surrogate Recovery)	%	113	137	114		NR70
6:2 FTS (Surrogate Recovery)	%	102	122	106		NR70
8:2 FTS (Surrogate Recovery)	%	113	126	100		NR70
8:2 diPAP (Surrogate Recovery)	%	131	151	120		NR70
Dates						
Date extracted		23-MAY-2022	23-MAY-2022	23-MAY-2022		
Date analysed		24-MAY-2022	24-MAY-2022	24-MAY-2022		

N22/009534
to
N22/009540

[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.

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Organics - NSW
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26-MAY-2022

Lab Reg No.		**N22/009534**	**N22/009538**	**N22/009540**		
Date Sampled		**10-MAY-2022**	**11-MAY-2022**	**12-MAY-2022**		
	Units					**Method**
Trace Elements						
Total Solids	%	79.9	73.6	84.0		NT2_49
Dates						
Date extracted		20-MAY-2022	20-MAY-2022	20-MAY-2022		
Date analysed		25-MAY-2022	25-MAY-2022	25-MAY-2022		

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Inorganics - NSW
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26-MAY-2022

All results are expressed on a dry weight basis.

REPORT OF ANALYSIS

Client	: [redacted]	**Job No.**	: AECO06/220517
		Quote No.	: QT-02018
		Order No.	: 60612563
		Date Received	: 17-MAY-2022
Attention	: [redacted]	**Sampled By**	: CLIENT
Project Name	: WBTA OMP		
Your Client Services Manager	: [redacted]	**Phone**	: [redacted]

Lab Reg No.	Sample Ref	Sample Description
N22/009535	0224_QC222_220510	WATER 10/5/22
N22/009539	0224_QC226_220511	WATER 11/5/22
N22/009541	0224_QC228_220512	WATER 12/5/22

Lab Reg No.			N22/009535	N22/009539	N22/009541		
Date Sampled			10-MAY-2022	11-MAY-2022	12-MAY-2022		
		Units					Method
PFAS (per-and poly-fluoroalkyl substances)							
PFBA (375-22-4)		ug/L	<0.005	<0.005	<0.005		NR70
PFPeA (2706-90-3)		ug/L	0.018	0.010	0.014		NR70
PFHxA (307-24-4)		ug/L	<0.001	<0.001	<0.001		NR70
PFHpA (375-85-9)		ug/L	<0.001	<0.001	<0.001		NR70
PFOA (335-67-1)		ug/L	<0.001	<0.001	<0.001		NR70
PFNA (375-95-1)		ug/L	<0.001	<0.001	<0.001		NR70
PFDA (335-76-2)		ug/L	<0.001	<0.001	<0.001		NR70
PFUdA (2058-94-8)		ug/L	<0.001	<0.001	<0.001		NR70
PFDoA (307-55-1)		ug/L	<0.001	<0.001	<0.001		NR70
PFTrDA (72629-94-8)		ug/L	<0.002	<0.002	<0.002		NR70
PFTeDA (376-06-7)		ug/L	<0.002	<0.002	<0.002		NR70
PFHxDA (67905-19-5)		ug/L	<0.002	<0.002	<0.002		NR70
PFODA (16517-11-6)		ug/L	<0.005	<0.005	<0.005		NR70
FOUEA (70887-84-2)		ug/L	<0.001	<0.001	<0.001		NR70
PFBS (375-73-5)		ug/L	<0.001	<0.001	<0.001		NR70
PFPeS (2706-91-4)		ug/L	<0.001	<0.001	<0.001		NR70
PFHxS (355-46-4)		ug/L	<0.001	0.0039	<0.001		NR70
PFHpS (375-92-8)		ug/L	<0.001	<0.001	<0.001		NR70
PFOS (1763-23-1)		ug/L	<0.002	0.0047	<0.002		NR70
PFNS (68259-12-1)		ug/L	<0.001	<0.001	<0.001		NR70
PFDS (335-77-3)		ug/L	<0.001	<0.001	<0.001		NR70
PFOSA (754-91-6)		ug/L	<0.001	<0.001	<0.001		NR70
N-MeFOSA (31506-32-8)		ug/L	<0.002	<0.01	<0.01		NR70
N-EtFOSA (4151-50-2)		ug/L	<0.002	<0.01	<0.01		NR70
N-MeFOSAA (2355-31-9)		ug/L	<0.002	<0.002	<0.002		NR70
N-EtFOSAA(2991-50-6)		ug/L	<0.002	<0.002	<0.002		NR70
N-MeFOSE (24448-09-7)		ug/L	<0.005	<0.005	<0.005		NR70
N-EtFOSE (1691-99-2)		ug/L	<0.005	<0.005	<0.005		NR70

REPORT OF ANALYSIS

Lab Reg No.			N22/009535	N22/009539	N22/009541		
Date Sampled			10-MAY-2022	11-MAY-2022	12-MAY-2022		
		Units					Method
PFAS (per-and poly-fluoroalkyl substances)							
4:2 FTS (757124-72-4)		ug/L	<0.001	<0.001	<0.001		NR70
6:2 FTS (27619-97-2)		ug/L	<0.001	<0.001	<0.001		NR70
8:2 FTS (39108-34-4)		ug/L	<0.001	<0.001	<0.001		NR70
10:2 FTS (120226-60-0)		ug/L	<0.001	<0.001	<0.001		NR70
8:2 diPAP (678-41-1)		ug/L	<0.002	<0.002	<0.002		NR70
PFBA (Surrogate Recovery)		%	127	123	124		NR70
PFPeA (Surrogate Recovery)		%	208	218	215		NR70
PFHxA (Surrogate Recovery)		%	112	97	103		NR70
PFHpA (Surrogate Recovery)		%	129	120	126		NR70
PFOA (Surrogate Recovery)		%	129	121	125		NR70
PFNA (Surrogate Recovery)		%	126	120	129		NR70
PFDA (Surrogate Recovery)		%	127	113	114		NR70
PFUdA (Surrogate Recovery)		%	115	97	100		NR70
PFDoA (Surrogate Recovery)		%	110	83	91		NR70
PFTeDA (Surrogate Recovery)		%	65	57	72		NR70
PFHxDA (Surrogate Recovery)		%	64	52	68		NR70
FOUEA (Surrogate Recovery)		%	97	82	84		NR70
PFBS (Surrogate Recovery)		%	108	97	98		NR70
PFHxS (Surrogate Recovery)		%	126	114	117		NR70
PFOS (Surrogate Recovery)		%	123	117	123		NR70
PFOSA (Surrogate Recovery)		%	107	86	91		NR70
N-MeFOSA (Surrogate Recovery)		%	49	<20	<20		NR70
N-EtFOSA (Surrogate Recovery)		%	41	<20	<20		NR70
N-MeFOSAA (Surrogate Recovery)		%	96	69	81		NR70
N-EtFOSAA (Surrogate Recovery)		%	88	70	81		NR70
N-MeFOSE (Surrogate Recovery)		%	80	40	40		NR70
N-EtFOSE (Surrogate Recovery)		%	89	43	45		NR70
4:2 FTS (Surrogate Recovery)		%	276	268	244		NR70
6:2 FTS (Surrogate Recovery)		%	140	144	131		NR70
8:2 FTS (Surrogate Recovery)		%	116	101	99		NR70
8:2 diPAP (Surrogate Recovery)		%	96	80	96		NR70
Dates							
Date extracted			24-MAY-2022	24-MAY-2022	24-MAY-2022		
Date analysed			24-MAY-2022	24-MAY-2022	24-MAY-2022		

N22/009535
to
N22/009541

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.
Surrogate recoveries low for selected analytes - PFAS LORs not raised since S/N >10.

LORs raised for MeFOSA and EtFOSA in sample N22/009539 and N22/009541 due to
low surrogate recovery.

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Organics - NSW

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26-MAY-2022

REPORT OF ANALYSIS

Report No. RN1352955

Client	: [redacted]	**Job No.**	: AECO06/220517
	[redacted]	**Quote No.**	: QT-02018
	[redacted]	**Order No.**	: 60612563
		Date Received	: 17-MAY-2022
Attention	: [redacted]	**Sampled By**	: CLIENT
Project Name	: WBTA OMP		
Your Client Services Manager	: Danny Slee	**Phone**	: [redacted]

Lab Reg No.	Sample Ref	Sample Description
N22/009536	0224_QC224_220510	WATER 10/5/22
N22/009537	0224_QC223_220511	WATER11/5/22
N22/009542	0224_QC229_220512	WATER 12/5/22

Lab Reg No.			N22/009536	N22/009537	N22/009542		
Date Sampled			10-MAY-2022	11-MAY-2022	12-MAY-2022		
		Units					Method
PFAS (per-and poly-fluoroalkyl substances)							
PFBA (375-22-4)		ug/L	<0.05	<0.05	<0.05		NR70
PFPeA (2706-90-3)		ug/L	<0.02	<0.02	<0.02		NR70
PFHxA (307-24-4)		ug/L	<0.01	<0.01	<0.01		NR70
PFHpA (375-85-9)		ug/L	<0.01	<0.01	<0.01		NR70
PFOA (335-67-1)		ug/L	<0.01	<0.01	<0.01		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	0.011	<0.01	<0.01		NR70
PFHxS (355-46-4)		ug/L	0.11	0.044	0.038		NR70
PFHpS (375-92-8)		ug/L	<0.01	<0.01	<0.01		NR70
PFOS (1763-23-1)		ug/L	0.023	<0.02	<0.02		NR70
PFNS (68259-12-1)		ug/L	<0.01	<0.01	<0.01		NR70
PFBS (375-73-5)		ug/L	<0.01	<0.01	<0.01		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

Lab Reg No.			N22/009536	N22/009537	N22/009542		
Date Sampled			10-MAY-2022	11-MAY-2022	12-MAY-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)		%	121	121	129		NR70
PFPeA (Surrogate Recovery)		%	123	124	128		NR70
PFHxA (Surrogate Recovery)		%	132	134	136		NR70
PFHpA (Surrogate Recovery)		%	131	127	132		NR70
PFOA (Surrogate Recovery)		%	125	125	132		NR70
PFNA (Surrogate Recovery)		%	130	121	129		NR70
PFDA (Surrogate Recovery)		%	130	126	133		NR70
PFUdA (Surrogate Recovery)		%	122	118	112		NR70
PFDoA (Surrogate Recovery)		%	130	123	126		NR70
PFTeDA (Surrogate Recovery)		%	124	125	130		NR70
PFHxDA (Surrogate Recovery)		%	138	133	129		NR70
FOUEA (Surrogate Recovery)		%	91	88	87		NR70
PFBS (Surrogate Recovery)		%	129	135	124		NR70
PFHxS (Surrogate Recovery)		%	129	129	130		NR70
PFOS (Surrogate Recovery)		%	123	126	127		NR70
PFOSA (Surrogate Recovery)		%	103	96	104		NR70
N-MeFOSA (Surrogate Recovery)		%	86	78	74		NR70
N-EtFOSA (Surrogate Recovery)		%	85	77	75		NR70
N-MeFOSAA (Surrogate Recovery)		%	108	116	108		NR70
N-EtFOSAA (Surrogate Recovery)		%	112	111	109		NR70
N-MeFOSE (Surrogate Recovery)		%	93	82	87		NR70
N-EtFOSE (Surrogate Recovery)		%	108	100	100		NR70
4:2 FTS (Surrogate Recovery)		%	125	120	121		NR70
6:2 FTS (Surrogate Recovery)		%	104	103	107		NR70
8:2 FTS (Surrogate Recovery)		%	123	110	120		NR70
8:2 diPAP (Surrogate Recovery)		%	147	121	135		NR70
Dates							
Date extracted			24-MAY-2022	24-MAY-2022	24-MAY-2022		
Date analysed			24-MAY-2022	24-MAY-2022	24-MAY-2022		

N22/009536
to
N22/009542

[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.

[redacted]
Organics - NSW
[redacted]

26-MAY-2022

This Report supersedes reports: *RN1352916*

Measurement Uncertainty is available upon request.

Note: Sampling date(s) have been provided by the client.

[redacted]

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/220517 **Sample Matrix:** Solid

Analyte	Method	LOR	Blank	Sample Duplicates			Recoveries	
				Sample	Duplicate	RPD	LCS	Matrix Spike
		mg/kg	mg/kg	mg/kg	mg/kg	%	%	%
				N22/009534				
PFBA (375-22-4)	NR70	0.002	<0.002	<0.002	<0.002	-	106	NA
PFPeA (2706-90-3)	NR70	0.002	<0.002	<0.002	<0.002	-	93	NA
PFHxA (307-24-4)	NR70	0.001	<0.001	<0.001	<0.001	-	98	NA
PFHpA (375-85-9)	NR70	0.001	<0.001	<0.001	<0.001	-	99	NA
PFOA (335-67-1)	NR70	0.001	<0.001	<0.001	<0.001	-	98	NA
PFNA (375-95-1)	NR70	0.001	<0.001	<0.001	<0.001	-	108	NA
PFDA (335-76-2)	NR70	0.001	<0.001	<0.001	<0.001	-	98	NA
PFUdA (2058-94-8)	NR70	0.002	<0.002	<0.002	<0.002	-	98	NA
PFDoA (307-55-1)	NR70	0.002	<0.002	<0.002	<0.002	-	92	NA
PFTrDA (72629-94-8)	NR70	0.002	<0.002	<0.002	<0.002	-	99	NA
PFTeDA (376-06-7)	NR70	0.002	<0.002	<0.002	<0.002	-	99	NA
PFHxDA (67905-19-5)	NR70	0.002	<0.002	<0.002	<0.002	-	83	NA
PFODA (16517-11-6)	NR70	0.005	<0.005	<0.005	<0.005	-	87	NA
FOUEA (70887-84-2)	NR70	0.001	<0.001	<0.001	<0.001	-	93	NA
PFBS (375-73-5)	NR70	0.001	<0.001	<0.001	<0.001	-	100	NA
PFPeS (2706-91-4)	NR70	0.001	<0.001	<0.001	<0.001	-	94	NA
PFHxS (355-46-4)	NR70	0.001	<0.001	<0.001	<0.001	-	95	NA
PFHpS (375-92-8)	NR70	0.001	<0.001	<0.001	<0.001	-	97	NA
PFOS (1763-23-1)	NR70	0.002	<0.002	<0.002	<0.002	-	97	NA
PFNS (68259-12-1)	NR70	0.001	<0.001	<0.001	<0.001	-	95	NA
PFDS (335-77-3)	NR70	0.001	<0.001	<0.001	<0.001	-	97	NA
PFOSA (754-91-6)	NR70	0.001	<0.001	<0.001	<0.001	-	98	NA
N-MeFOSA (31506-32-8)	NR70	0.002	<0.002	<0.002	<0.002	-	92	NA
N-EtFOSA (4151-50-2)	NR70	0.002	<0.002	<0.002	<0.002	-	98	NA
N-MeFOSAA (2355-31-9)	NR70	0.002	<0.002	<0.002	<0.002	-	107	NA
N-EtFOSAA(2991-50-6)	NR70	0.002	<0.002	<0.002	<0.002	-	97	NA
N-MeFOSE (24448-09-7)	NR70	0.005	<0.005	<0.005	<0.005	-	98	NA
N-EtFOSE (1691-99-2)	NR70	0.005	<0.005	<0.005	<0.005	-	84	NA
4:2 FTS (757124-72-4)	NR70	0.001	<0.001	<0.001	<0.001	-	101	NA
6:2 FTS (27619-97-2)	NR70	0.001	<0.001	<0.001	<0.001	-	112	NA
8:2 FTS (39108-34-4)	NR70	0.001	<0.001	<0.001	<0.001	-	92	NA
10:2 FTS (120226-60-0)	NR70	0.002	<0.002	<0.002	<0.002	-	97	NA
8:2 diPAP (678-41-1)	NR70	0.002	<0.002	<0.002	<0.002	-	73	NA

Results expressed in percentage (%) or mg/kg 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]

Date:

[redacted]

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/220517 **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	0.005	<0.005	NA	NA	NA	106	NA
PFPeA (2706-90-3)	NR70	0.002	<0.002	NA	NA	NA	99	NA
PFHxA (307-24-4)	NR70	0.001	<0.001	NA	NA	NA	105	NA
PFHpA (375-85-9)	NR70	0.001	<0.001	NA	NA	NA	102	NA
PFOA (335-67-1)	NR70	0.001	<0.001	NA	NA	NA	103	NA
PFNA (375-95-1)	NR70	0.001	<0.001	NA	NA	NA	103	NA
PFDA (335-76-2)	NR70	0.001	<0.001	NA	NA	NA	117	NA
PFUdA (2058-94-8)	NR70	0.001	<0.001	NA	NA	NA	111	NA
PFDoA (307-55-1)	NR70	0.001	<0.001	NA	NA	NA	111	NA
PFTrDA (72629-94-8)	NR70	0.002	<0.002	NA	NA	NA	116	NA
PFTeDA (376-06-7)	NR70	0.002	<0.002	NA	NA	NA	105	NA
PFHxDA (67905-19-5)	NR70	0.002	<0.002	NA	NA	NA	105	NA
PFODA (16517-11-6)	NR70	0.005	<0.005	NA	NA	NA	113	NA
FOUEA (70887-84-2)	NR70	0.001	<0.001	NA	NA	NA	106	NA
PFBS (375-73-5)	NR70	0.001	<0.001	NA	NA	NA	110	NA
PFPeS (2706-91-4)	NR70	0.001	<0.001	NA	NA	NA	112	NA
PFHxS (355-46-4)	NR70	0.001	<0.001	NA	NA	NA	107	NA
PFHpS (375-92-8)	NR70	0.001	<0.001	NA	NA	NA	111	NA
PFOS (1763-23-1)	NR70	0.002	<0.002	NA	NA	NA	105	NA
PFNS (68259-12-1)	NR70	0.001	<0.001	NA	NA	NA	101	NA
PFDS (335-77-3)	NR70	0.001	<0.001	NA	NA	NA	98	NA
PFOSA (754-91-6)	NR70	0.001	<0.001	NA	NA	NA	95	NA
N-MeFOSA (31506-32-8)	NR70	0.002	<0.002	NA	NA	NA	99	NA
N-EtFOSA (4151-50-2)	NR70	0.002	<0.002	NA	NA	NA	104	NA
N-MeFOSAA (2355-31-9)	NR70	0.002	<0.002	NA	NA	NA	110	NA
N-EtFOSAA(2991-50-6)	NR70	0.002	<0.002	NA	NA	NA	98	NA
N-MeFOSE (24448-09-7)	NR70	0.005	<0.005	NA	NA	NA	106	NA
N-EtFOSE (1691-99-2)	NR70	0.005	<0.005	NA	NA	NA	88	NA
4:2 FTS (757124-72-4)	NR70	0.001	<0.001	NA	NA	NA	97	NA
6:2 FTS (27619-97-2)	NR70	0.001	<0.001	NA	NA	NA	108	NA
8:2 FTS (39108-34-4)	NR70	0.001	<0.001	NA	NA	NA	94	NA
10:2 FTS (120226-60-0)	NR70	0.001	<0.001	NA	NA	NA	93	NA
8:2 diPAP (678-41-1)	NR70	0.002	<0.002	NA	NA	NA	73	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:

[redacted]

Australian Government

National Measurement Institute

QUALITY ASSURANCE REPORT

Client: AECOM AUSTRALIA PTY LTD

NMI QA Report No: AECO06/2220517 **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	110	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	106	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	100	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	100	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	108	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	109	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	97	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	102	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	107	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	103	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	110	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	106	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	104	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	101	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	99	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	93	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	106	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	106	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	111	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	106	NA
N-EtFOSE (1691-99-2)	NR70	0.05	<0.05	NA	NA	NA	87	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	118	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	118	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	99	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	80	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	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]

Date:

[redacted]

Appendix F

Equipment Calibration Certificates

Appendix F Equipment Calibration Certificates

Multi Parameter Water Meter

Instrument YSI Quatro Pro Plus
Serial No. 18J104306

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		381241	pH 7.01
2. pH 4.00		pH 4.00		380327	pH 4.01
3. ORP		236.4mV		375760/368285	235.8mV
4. EC		2760uS		377099	2634uS
5. D.O		100%			100.2% - 760.8mmHg
6. Temp		21.6oC		MultiTherm 09000528	21.5oC

Calibrated by: [redacted]

Calibration date: 29/04/2022

Next calibration due: 26-Oct-22

Oil / Water Interface Meter

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Instrument Interface Meter (30M)
Serial No. 312531

Item	Test	Pass	Comments
Battery	Compartment	✓	
	Capacity	✓	
	above 7.9V	✓	
Probe	Cleaned/Decon.	✓	
	Operation	✓	
Connectors	Condition	✓	
		✓	
Tape Check	Cleaned	✓	
Connectors	Checked for cuts	✓	
Instrument Test	At surface level	✓	

Certificate of Calibration

This is to certify that the above instrument has been cleaned and tested.

Tested by: [redacted]

Test date: **3/05/2022**

Next Test due: **30/10/2022**

FIELDWORK QUALITY MANUAL

FQM-5.10-F1 – WATER QUALITY METER CALIBRATION RECORD

Project Name:	WBTA OMP	**Project Number:**	60612563
Project Location:	WBTA	**Client:**	Dept of Defence
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:	
Make and Model:	
Serial Number:	

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS 10/5/22 8:00

Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH ~~4.00~~	pH 7.0	µS/cm	ppm	ppm
Calibration Standard Concentration:	4.00	7.0	2760	0.0	
Calibration Reading:	4.09	7.08	2750	0.0	
Calibration Temperature:	21.5	21.5	21.5	21.5	

~~ONGOING CHECKS~~ Calibration

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time: 17/5/22. 8:00

Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:	4.0	7.0	2760	0.0	
Cal ~~Bump Test~~ Reading:	4.08	7.09	2765	0.0	
Cal ~~Bump Test~~ Temperature:	21.5	21.5	21.5	21.5	

~~COMMENTS~~ Calibrate

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

Date and Time	18/5/22. 8:00			
Parameter	Acidity		Conductivity	DO
Units	pH	pH	µS/cm	ppm ppm
Cal Std conc	4.0	7.0	2760	
Cal Reading	4.10	7.10	2780	0.0
Cal Temp	21.5	21.5	21.5	0.0

Approval and Distribution

☐ Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

[redacted] — **Fieldwork Staff Signature**

[redacted] — **Date**

Distribution: Project Central File

FIELDWORK QUALITY MANUAL

FQM-5.10-F1 – WATER QUALITY METER CALIBRATION RECORD

Project Name:	WBTA OMP	**Project Number:**	60612563
Project Location:	WBTA	**Client:**	Dept of Defence
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:	Airmet
Make and Model:	YSI
Serial Number:	See cal cert

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS 13/5/22 7:45

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	ppm	ppm
Calibration Standard Concentration:	4.00	7.0	2760	0.0	
Calibration Reading:	4.1	7.1	2773	0.0	
Calibration Temperature:	20.5	20.5	20.5	20.5	

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.

Approval and Distribution

☐ Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

Fi[redacted]

13/5/22
Date

Distribution: Project Central File

Prepared for
Department of Defence
ABN: 68706814312

Sampling Event Factual Report, October 2022

PFAS OMP - Wide Bay Training Area

18-Jan-2023
Doc No. 60612563_RP062_2_230118

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Delivering a better world

Sampling Event Factual Report, October 2022

PFAS OMP - Wide Bay Training Area

Client: Department of Defence

ABN: 68706814312

Prepared by

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18-Jan-2023

Job No.: 60612563

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

Quality Information

Document	Sampling Event Factual Report, October 2022
Ref	60612563
Date	18-Jan-2023
Prepared by	[redacted]
Reviewed by	[redacted]

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
0	18-Nov-2022	Draft	[redacted]	
1	13-Jan-2023	Draft	[redacted]	
2	18-Jan-2023	Final	[redacted]	[redacted]

Table of Contents

List of Tables (in Text)

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Abbreviation	
ALS	Australian Laboratory Services
ASC NEPM	Assessment of Site Contamination National Environment Protection Measure 1999 (as amended 2013)
COC	Chain of Custody
DCMM	Defence Contamination Management Manual
Defence	Department of Defence
DO	Dissolved oxygen
EC	Electrical conductivity
HEPA	Heads of Environmental Protection Agencies
IP	Interface probe
LOR	Limit of reporting
NATA	National Association of Testing Authorities
NEMP	National Environmental Management Plan
NHMRC	National Health and Medical Research Council
NMI	National Measurement Institute
OMP	Ongoing management plan
ORP	Oxidation reduction potential
PFAS	Per- and poly-fluorinated alkyl substances
PFHxS	Perfluorohexane sulfonate
PFOA	Perflurooctanoic acid
PFOS	Perflurooctanesulfonic acid
PMAP	PFAS management area plan
POL	Paints, oil and lubricants
QA/QC	Quality assurance / quality control
QLD	Queensland
RPD	Relative percent difference
SAQP	Sampling analysis and quality plan
SWL	Standing water level
WBTA	Wide Bay Training Area
WWTP	Wastewater treatment plant

Units of Measurement			
L	Litres	m	Metres
mg	Milligram	ha	Hectares
kg	Kilogram	µg	Microgram
mV	Millivolts	mbtoc	Metres below top of casing
mAHD	metres Australian height datum		

1.0 Introduction

1.1 General

AECOM Australia Pty Ltd (AECOM) has been engaged by the Department of Defence (Defence) to implement the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Plan (OMP) (Defence, 2020) at the Wide Bay Training Area (WBTA) (the 'Site') and the WBTA Management Area in the South Queensland Region. The locations of the Site and the Management Area are shown in **Figure 1** in **Appendix A**. The OMP for WBTA includes the following sampling events:

- Biannual sampling events[1] in October 2020, April 2021, October 2021, April 2022, October 2022 and April 2023 including:
  - Groundwater sampling of 17 on-Site groundwater monitoring wells and five off-Site groundwater monitoring wells.
  - Surface water sampling of creeks and dams at 13 on-Site and six off-Site sampling locations[2].
  - Tap sampling of the two on-Site groundwater extraction bores.
  - Tap sampling of the treated wastewater from the outlet tap of the Camp Kerr wastewater treatment plant (WWTP).
- Sediment samples (co-located with the surface water samples) at creeks and dams to be collected once per year in April 2021, April 2022 and April 2023.
- Up to two event-based sampling of the WWTP during times of high site usage.

Following each sampling event, a Sampling Event Factual Report will be prepared. Annual interpretive 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 biannual sampling event completed in October 2022, specifically highlighting any first-time detections and/or new exceedances of human health or ecological (freshwater species) screening criteria for PFHxS+PFOS and / or PFOA.

This report has been prepared in accordance with the *PFAS OMP Factual Report Guidance,* v0.2, May 2021 (Defence, 2021).

1.2 Objectives

The objectives of the OMP program are to:

- Implement the OMP prepared as part of the PFAS Management Area Plan (PMAP); and
- Collect data that will enable Defence to maintain an up-to-date understanding of the distribution, concentration and transport of PFAS at the Site and WBTA Management Area.

The data will assist in the timely identification of risks and inform Defence's approach to the management of PFAS, including updates and revisions to the PMAP.

The objective of this phase of works is to implement the scope of works for the biannual October 2022 sampling event (identified in **Section 2.0**) in accordance with the Sampling and Analysis Quality Plan (SAQP) Rev 7 (AECOM, 2022a).

[1] Due to training exercises at the Base preventing safe access to sampling locations, three of the four sampling events completed to date have been conducted one month later than scheduled, occurring in October 2020, May 2021, November 2021 and May 2022.
[2] The OMP specifies 13 on-Site and seven off-Site surface water / sediment sampling locations. However, one of the surface water / sediment sampling locations have been removed as the stakeholder declined access permission. The latest version of the SAQP [Rev 7] (AECOM, 2022a) identifies six off-Site surface water / sediment sampling locations. One of these locations could not be accessed during the October 2022 sampling event as identified in Section 2.0.

2.0 Scope of Work

The biannual sampling event at WBTA was completed in accordance with the SAQP (AECOM, 2022a [Rev 7]). In summary, the scope of work for this sampling event included:

- Obtaining access to private properties where some surface water 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) (Heads of Environmental Protection Authorities [HEPA], 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.
- Gauging of groundwater level at 22 locations including 17 on-Site and five off-Site monitoring wells (located on Council / State land) prior to collection of samples[3] (refer to **Table 1** below, and **Figure 2** and **Figure 3** in **Appendix A** for specific locations).
- Tap sampling of the two on-Site groundwater extraction bores (refer to **Table 1** below and **Figure 3** in **Appendix A** for specific locations).
- Tap sampling of the treated wastewater from the outlet tap of the Camp Kerr WWTP (refer to **Table 2** below and **Figure 3** in **Appendix A** for specific location).
- Collection of surface water samples at 18 of 19 locations including 13 on-Site and six off-Site locations (refer to **Table 3** below, and **Figure 2** and **Figure 3** in **Appendix A**). One of the off-Site surface water samples (SW024) could not be collected as the stakeholder did not provide access permission.
- Tap sampling of the treated wastewater from the outlet tap of the Camp Kerr WWTP during a period of high site usage in August 2022.
- Collecting field quality control samples including field duplicate and triplicate samples at a rate of 1 in 10 primary samples and collecting one rinsate sample per fieldwork day as per the SAQP.
- Analysis of all groundwater samples for the PFAS suite at the standard limit of reporting (LOR).
- Analysis of all surface water samples for the PFAS suite at trace levels of detection.
- Analysis of the WWTP outlet sample for the PFAS suite at the standard LOR.
- Data management of all OMP field and laboratory data in the Defence ESdat database.
- Preparation of results letters for off-site stakeholders.
- Preparation of this Sampling Event Factual Report.

[3] Two groundwater sampling locations, POT001 and POT005, have pumps installed and consequently groundwater levels cannot be gauged.

Table 1 Groundwater Sampling Locations

Location	Monitoring Well	Abstraction Bores
Paints, oils and lubricants (POL) Refuelling point	MW101, MW102, MW115	
Airfield	MW103, MW104, MW105	
Southern site boundary	MW106	
Electronic Classification Range	MW107	
Landfill 1	MW108	
Eastern site boundary	MW109	
Multiuser Firing Point Range	MW110	
Possible demonstration area	MW111	
WWTP discharge areas	MW112, MW113*, MW114*, MW120, MW121, MW122	
Central portion of Camp Kerr	MW119	
Down-gradient / cross-gradient of Camp Kerr	MW116*, MW117*, MW118*	
Water treatment plant (Production bores)		POT001, POT005
Note: * denotes off-site sampling location		

Table 2 Wastewater Sampling Locations

Description	Tapwater Sampling Locations
Wastewater treatment plant outlet	OTH001

Table 3 Surface Water Sampling Locations

Area	Description	Surface Water Sampling Locations
Creek	Kauri Creek	SW004, SW008, SW012
	Mosquito Creek	SW005
	Kangaroo Creek	SW006, SW007, SW009
	Schnapper Creek	SW013, SW014, SW016
Drainage Channel	Site entrance (receives runoff from WWTP discharge areas)	SW017
	Vehicle wash point drainage channel	SW018
	Ponded water from surface water flows flowing overland from Camp Kerr	SW019
	Drainage pipe at Clyde Road discharging runoff from Camp Kerr to residential dam	SW027*
	Ephemeral waterway draining residential dams in Wallu	SW025*
Dams	Residential dams in Wallu	SW021*, SW022*, SW023*, SW024*#
Note: * denotes off-site sampling location # sample not collected as stakeholder did not provide access permission.		

3.0 Methodology

The methodology used for the October 2022 sampling event was in accordance with the SAQP (AECOM, 2022a) and is summarised below.

3.1 Groundwater Sampling Methodology

Table 4 Groundwater 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. Due to ongoing training activities in different areas of the Base at the time of the fieldworks, areas of the Base were only accessible at specific times/days. Consequently, groundwater gauging data were collected over several days, between 17 and 21 October 2022.
Groundwater quality parameter field measurements	Temperature, electrical conductivity (EC), dissolved oxygen (DO), oxidation-reduction potential (ORP), pH and observations of water quality were recorded for all groundwater samples. Equipment calibration certificates are provided in **Appendix F**.
Sampling methodology	Groundwater samples were collected from all monitoring wells using no-purge methodology HydraSleeves™, which were installed within the screened interval of each well, approximately 1 m above the base of the well (the target depth is shown in **Table T1** in **Appendix A**), for a minimum of 24 hours prior to the sampling round. Once sampling was completed, new HydraSleeves™ were deployed at the screened interval depth in preparation for the next sampling round. Tap samples from extraction bores were collected by opening the tap / valve. Water samples were collected by placing the laboratory provided sample bottle beneath the tap outlet.
Sample analysis	All primary samples were submitted for PFAS suite using the standard levels of detection. ALS Environmental (ALS) Brisbane, Queensland 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 groundwater analyses were certified by the National Association of Testing Authorities (NATA). Chain of custody (COC) forms and laboratory certificates are presented in **Appendix D** and **Appendix E** respectively.
QA/QC Samples	Field quality assurance (QA) / quality control (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 QA/QC sample data.

3.2 Surface Water Sampling Methodology

Table 5 Surface Water Sampling Methodology

Item	Details
Surface water parameter field measurements	Temperature, EC, DO, ORP, pH and observations of water quality were recorded for all surface water samples. Equipment calibration certificates are provided in **Appendix F**.
Sampling methodology	Samples were collected from immediately 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 with the cap immediately applied once the container was full.
Sample analysis	All primary samples were submitted for PFAS suite using the trace levels of detection. ALS Brisbane, Queensland was used as the primary laboratory. NMI of Sydney, NSW was used as the secondary laboratory. ALS and NMI methods for groundwater analyses were certified by the NATA. COC forms and laboratory certificates are presented in **Appendix D** and **Appendix E** respectively.
QA/QC Samples	Field QA/QC samples collected included intra-laboratory duplicate and inter-laboratory duplicate samples and rinsate samples. Refer to **Appendix C** for assessment of QA/QC sample data.

3.3 Wastewater Sampling Methodology

Table 6 Wastewater Sampling Methodology

Item	Details
Locations sampled	OTH001 was collected from an outlet at the WWTP.
Sampling methodology	The tap was opened and a laboratory provided sample bottle was placed beneath the tap outlet. The sample bottle was filled to the top to ensure no headspace and the cap was immediately applied. The sample bottle was immediately placed in a cooler with cooling media.
Sample analysis	The sample was submitted for PFAS suite using the standard levels of detection.

3.4 Adopted Screening Criteria

Adopted screening criteria references national guidance in the form of the PFAS National Environmental Management Plan (NEMP), Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance. Guidance documents used to assess the dataset includes the following:

- Heads of Environmental Protection Agencies (HEPA), 2020. PFAS NEMP v2.0 January 2020 (HEPA, 2020).
- Department of Health, 2019. Health Based Guidance Values for PFAS for use in site investigations in Australia. April 2017 [updated 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.

The adopted PFAS screening criteria to assess the data generated as part of the OMP are presented in **Table 7** below.

Table 7 Summary of Adopted Screening Criteria

Pathway	Compound	Criteria	Comment / Reference
Human Health Receptors			
Drinking water - groundwater	PFOS + PFHxS	0.07 µg/L	The values are from 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 NEMP (HEPA, 2020) are from NHMRC (2019). *All surface water and WWTP (OTH001) results will be compared to these criteria.*
	PFOA	10 µg/L	
Ecological Receptors			
Freshwater / marine water (99% species protection values)	PFOS	0.00023 µg/L	The values are from the 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 (except SW025), groundwater and WWTP (OTH001) results will be compared to these criteria.*
	PFOA	19 µg/L	
Freshwater / marine water (95% species protection values)	PFOS	0.13 µg/L	Surface water in the ephemeral waterway south of Clyde Road (SW025) should be screened against freshwater ecological guidelines for slight to moderately disturbed ecosystems (95% species protection).
	PFOA	220 µg/L	

3.5 Data Quality Objectives and Data Validation

The data quality objectives and data quality indicators adopted for these works are presented in the SAQP (AECOM, 2022a).

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

The 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 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 (Defence 2018, amended August 2021) requirements.

3.6 Deviations from the SAQP

Table 8 lists the deviations from the SAQP (AECOM, 2022a) during this sampling event.

Table 8 Deviations from the SAQP during the October 2022 Sampling Event

SAQP	Comment / Justification	Impact on Dataset
Surface water and sediment sampling at 19 locations	Sample SW024 could not be collected as the stakeholder declined access.	The non-sampling of this location is not considered to have a large impact on the understanding of potential risk as a downstream location was monitored during the sampling event. The non-sampling of this location means there are no data available in October 2022 to evaluate the trend in PFAS concentrations.

4.0 Field Observations and Results

The October 2022 biannual sampling event was completed between 17 and 21 October 2022. The results are summarised in following sections.

4.1 Groundwater

4.1.1 Groundwater Observations and Quality Parameter Field Measurements

Table 9 Groundwater Observations and Quality Parameter Field Measurements

Compound	Criteria
Access	All monitoring wells and bores were accessible.
Monitoring Well Network	Covers to the groundwater monitoring wells were noted to be in good condition at the time of sampling.
Field Observations	No visible or olfactory indications of contamination were observed during the sampling of the groundwater monitoring wells. Field observations are presented **Table T1** in **Appendix B**.
Depth to Groundwater	Depth to groundwater in the monitoring wells was between 0.778 (MW109) metres below top of casing (mbtoc) and 10.589 mbtoc (MW101). Groundwater elevations in these wells were between 8.429 metres above Australian Height Datum (mAHD) (MW109) and 73.491 mAHD (MW119). Groundwater gauging data are presented in **Table T1** in **Appendix B**.
Groundwater Flow Direction	Inferred groundwater contours and groundwater flow directions in the greater WBTA area in October 2022 are shown on **Figure 4** in **Appendix A**. The inferred local groundwater flow direction is generally from the southwest to the northeast, towards Tin Can Bay Inlet. Inferred groundwater contours and groundwater flow directions within and immediately adjacent to Camp Kerr between 17 and 21 October 2022 are shown on **Figure 5** in **Appendix A**. A groundwater divide appears to be present in the central portion of Camp Kerr with groundwater to the east of the groundwater divide flowing towards the east. Groundwater to the west of the groundwater divide appears to be flowing to the west and southwest towards Wallu, and towards the south. The observed groundwater divide is consistent with that observed in previous investigations (AECOM, 2020) and previous OMP sampling events in October 2020, May 2021, November 2021 and May 2022 (AECOM, 2022b).
Groundwater Quality Parameter Field Measurements	Groundwater quality parameters were measured prior to collecting groundwater samples. The readings are presented in **Table T1** in **Appendix B** and are summarised below: • EC ranged from 72.5 µS/cm (MW114) to 621 µS/cm (MW105) indicating fresh conditions. • pH ranged from 4.84 (MW122) to 7.1 (MW108) with a mean pH of 5.7 indicating slightly acidic conditions. • ORP ranged from 251.2 mV (MW108) to 342.5 mV (MW121) indicating mildly to moderately reducing conditions. • Temperature ranged from 19.4°C (MW117) to 23.8°C (MW102). • The DO results ranged between 0.60 mg/L (MW113) and 3.95 mg/L (MW103) indicating poorly to moderately oxygenated conditions.
Weather Conditions	Weather conditions during groundwater sampling were wet with moderate rainfall on one of the five days and light rainfall on the other four. There was a total of 38.8 mm of rainfall during the sampling period. The maximum daily temperature recorded during the sampling event was 25.0°C on 18 October 2022.

Compound	Criteria
Estate Management Works or Training Activities	During the sampling event there was notable road repair works in various parts of the base. However, they were not considered to be in the vicinity of any sampling locations.

4.1.2 PFAS Groundwater Analytical Results

The PFAS groundwater analytical results from this sampling event are presented in **Table T2** in **Appendix B**. There were no first-time detections of PFAS in the samples in the October 2022 sampling event. There were no new exceedances of the guideline values.

Two groundwater samples exceeded the HEPA (2020) drinking water guideline value for sum of PFHxS and PFOS (MW121 and MW122). Three groundwater samples (MW118, MW121 and MW122) reported PFOS above the limit of reporting at a concentration that exceeded the HEPA (2020) ecological guideline value for 99% protection of freshwater species. There were no new exceedances of the human health or ecological guidelines values for PFOA.

With the exception of PFHxS, no PFAS compounds were detected at concentrations that exceeded the limit of reporting in groundwater samples from the two extraction bores, Bore 1 (POT001) and Bore 2 (POT005). PFHxS was detected at a concentration of 0.03 µg/L in Bore 1 and was not detected in Bore 2. Sum of PFHxS+PFOS, PFOS and PFOA concentrations did not exceed the human health or ecological guideline values in these potable water samples.

4.2 Surface Water

4.2.1 Surface Water Observations and Quality Parameter Field Measurements

Table 10 Surface Water Observations and Quality Parameter Field Measurements

Compound	Criteria
Access	All surface water sampling locations were accessible during the October 2022 sampling event. Prior to conducting sampling on private properties, access permissions were obtained from stakeholders.
Field Observations	No visual or olfactory indications of contamination were observed during the sampling of the surface water sampling locations. Field observations are presented in **Table T3** in **Appendix B**.
Surface Water Quality Parameter Field Measurements	Surface water quality parameters were measured prior to collecting surface water samples. The readings are presented in **Table T3** in **Appendix B** and are summarised below: • DO ranged from 1.00 mg/L (SW027) to 6.50 mg/L (SW017). The average was 3.7 mg/L indicating moderately oxygenated conditions. • EC in freshwater environments (inland creeks and dams) ranged from 34.0 µS/cm (SW018) to 545 µS/cm (SW014) indicating fresh conditions. EC in the three estuarine sample locations were between 24179 µS/cm (SW013) and 39340 µS/cm (SW012) indicating saline conditions. • pH ranged from 4.91 (SW016) to 7.25 (SW012). pH results generally indicated slightly acidic conditions. • Corrected ORP ranged from 253.7 mV (SW025) to 357.6 mV (SW016) indicating mildly reducing conditions. • Temperature ranged from 18.4°C (SW027) and 27.4°C (SW013).

Compound	Criteria
Weather Conditions	Weather conditions during surface water sampling were wet with moderate rainfall on one of the five days and light rainfall on the other four. There was a total of 38.8 mm of rainfall during this period. The maximum daily temperature recorded during the sampling event was 25.0°C on 18 October 2022.
Estate Management Works or Training Activities	During the sampling event there was notable road repair works in various parts of the base. However, they were not considered to be in the vicinity of any sampling locations.

4.2.2 PFAS Surface Water Analytical Results

The PFAS surface water analytical results from this sampling event are presented in **Table T4** in **Appendix B**. There were no first-time detections or new exceedances of the human health guideline values in the October 2022 sampling event for PFOA and sum of PFHxS+PFOS. Three surface water samples (SW013, SW019, SW027) reported PFOS above the limit of reporting at concentrations that exceeded the HEPA (2020) ecological guideline value for 99% protection of fresh / marine water species. No surface water samples reported PFOA at concentrations that exceeded the HEPA (2020) ecological guideline value for 99% protection of fresh / marine water species.

Concentrations of PFOS and PFOA at SW025 did not exceed the HEPA (2020) ecological guideline value for 95% species protection of freshwater species.

4.3 Wastewater Observations, Quality Parameter Field Measurements and Analytical Results

Wastewater observations and quality parameter field measurements are presented in **Table T5**, **Appendix B**. The water was clear with no sheen or odour. The field parameters indicated the water was neutral, fresh, well oxygenated, and mildly reducing.

The PFAS analytical results for the two wastewater samples are presented in **Table T6** in **Appendix B**. One compound, PFHxS was detected at 0.02 µg/L in both samples during both August and October 2022. There were no first-time detections of PFAS or new exceedances of the human health or ecological guideline values in the August 2022 and October 2022 sampling events.

5.0 Summary and Next Sampling Event

5.1 Summary of Monitoring Event

A biannual groundwater, surface water and wastewater monitoring event was completed at the WBTA Management Area between 17 and 21 October 2022. The event included sampling of groundwater from 22 monitoring wells, two extraction bores, two wastewater samples from the WWTP and 18 surface water samples. The WWTP was also sampled during an ad-hoc sampling event on 25 August 2022. **Table 11** summarises the findings of the August and October 2022 sampling events and the recommended actions.

Table 11 Summary of Sampling Event

Item	Comment	Recommended Actions
Access to sampling locations	All 22 monitoring wells, two extraction bores and 18 surface water / sediment sampling locations were accessible and able to be sampled. One surface water sampling location could not be sampled (SW024) as the stakeholder declined access. The WWTP outlet was able to be sampled during August and October 2022 sampling events.	AECOM will liaise with the private property owners to attempt to arrange access to location SW024 during the next scheduled biannual OMP sampling event.
Monitoring well network condition	No issues were identified with the well network condition.	None.
Analytical results	PFAS concentrations in all groundwater, surface and wastewater samples were consistent with historical results. Sum of PFHxS and PFOS concentrations exceeded the HEPA (2020) drinking water guidelines value in two groundwater samples (MW121 and MW122). PFOS concentrations exceeded the HEPA (2020) ecological guideline value (99% species protection) in three groundwater and three surface water samples.	Ongoing monitoring in accordance with the OMP.
First-time detections of sum of PFHxS+PFOS or PFOA	There were no first-time detections of sum of PFHxS+PFOS or PFOA in the 24 groundwater samples, the 18 surface water samples or the two wastewater samples.	Ongoing monitoring in accordance with the OMP.
First time exceedance of HEPA (2020) drinking water or recreational use guidelines	There were no new exceedance of the HEPA (2020) drinking water or ecological guidelines.	Ongoing monitoring in accordance with the OMP.

5.2 Upcoming Sampling Events

The next biannual sampling event is scheduled for April 2023.

5.3 Upcoming Annual Interpretive Report

The next annual interpretive report is scheduled for January 2023.

6.0 References

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Appendix A

Figures

Appendix A Figures

G:\ENV\GIS\Projects\605\60580555 Wide Bay Training Area\FIGURES\60580555 F2 Investigation Area 08 01 2020 TO Rev B

AECOM Imagine it. Delivered.

LOCATION OF WBTA AND MANAGEMENT AREA

October 2022 Sampling Event Wide Bay Training Area, Queensland

FIGURE 1

Pioneer Point Boat Ramp
Tin Can Bay
Inskip
Pannikin Island
UOTF/EHTA
Demolition Range
SW/SD012
Old Boat Ramp/Sentry Post
Little Sandy Creek
Airstrip UAV
24m Tower
Wide Bay Training Area
SW/SD005
SW/SD008
Hexagon Creek
Archer Creek
Griffin Creek
SW/SD009
Forward Operating Base
Carlo Island
AGR/SGR/DFSW
SW/SD004
Kauri Creek
Easy Feature/MUFP/MCR/BIF
Tanglewood Creek
Paddo Point
Tin Can Inlet
Snapper Point
Smooger Point
Tin Can Bay
Quarry
Tin Can Bay Waste Transfer Station and Sewage Treatment Works
MW109
SW/SD013
MW110
SW/SD014
Ammunition Storage
Toolara
Manyborough - Cooloola Road
SW/SD007
Range/ECR
MW104
MW107
MW105
Teewah Point
MW108
SW/SD006
MW103
North Cooloola Point
Landfill 1
SW/SD016
Tin Can Bay Road
MW111
MW106
Area shown in Figure 4
Wallu Heights
Rainbow Beach Road
Snapper Creek
Wallu
Eurunnul Creek
Cooloola Cove
South Cooloola Point
Poverty Point

KEY
- Wide Bay Training Area
- Investigation Area / Management Area
- Great Sandy Strait Ramsar
- Parks and recreation reserves
- Major road
- Road
- Watercourse
- Surface water sample location
- Groundwater monitoring well location

0 2km

G:\ENV\GIS\Projects\60560580555 Wide Bay Training Area\FIGURES\60560580555 F3 Sample Locations (Greater WBTA) 08 01 2020 TO Rev B

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UOTF – Urban Operations Training Facility
AGR – Assault Grenade Range
SGR – Standard Grenade Range
MUFP - Multi User Firing point
MCR – Multi Classification Range
ECR – Electronic Classification Range
BIF – Battle Inoculation Facility

SAMPLING LOCATIONS (GREATER WIDE BAY TRAINING AREA)

October 2022 Sampling Event -Wide Bay Training Area, Queensland

FIGURE 3

G:\ENV\GIS\Projects\605\60580555 Wide Bay Training Area\FIGURES\605805555\PMAP_Figure 3 Site Features 08/05/2020 JP Rev 1

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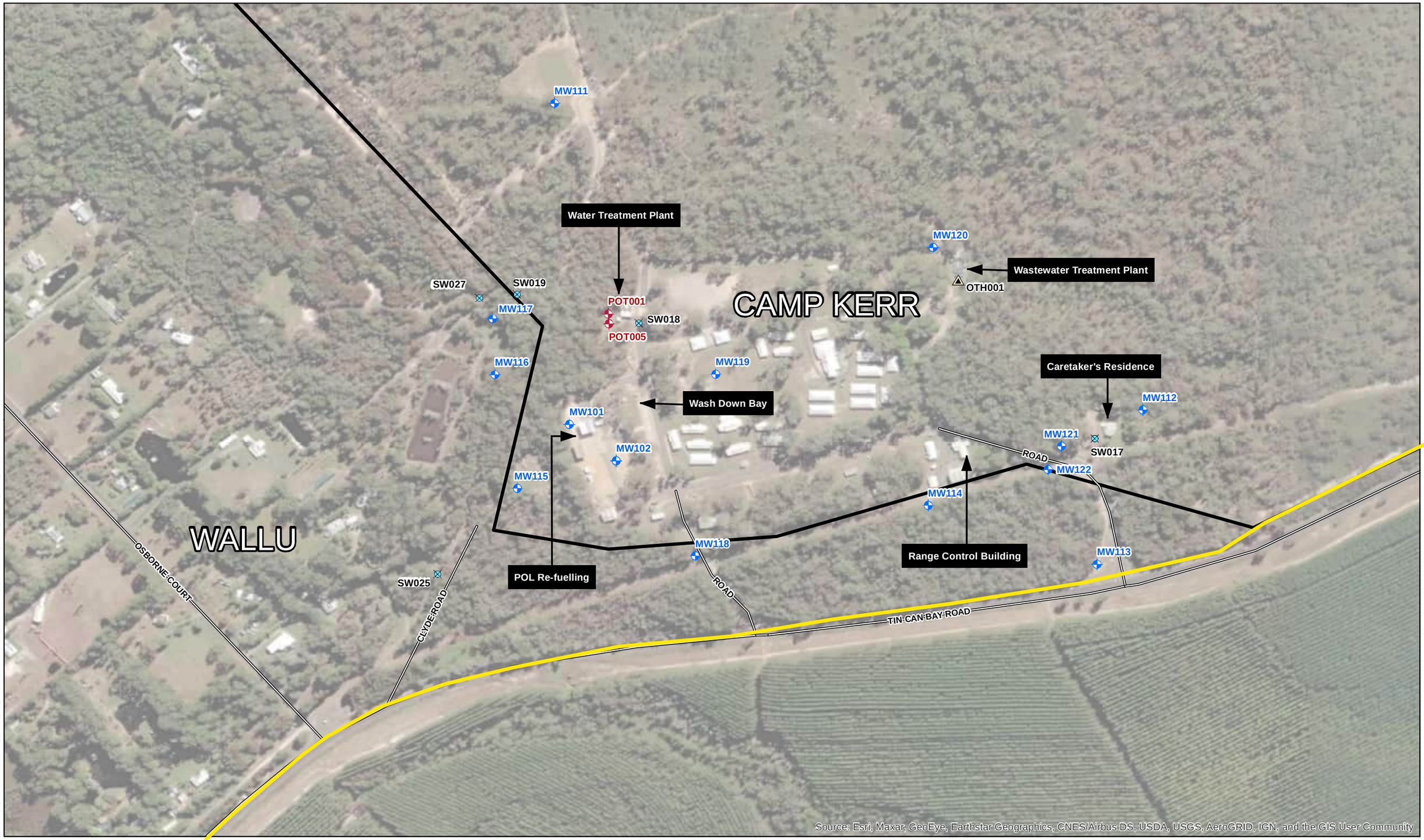
Definitions
UOTF – Urban Operations Training Facility
AGR – Assault Grenade Range
SGR – Standard Grenade Range
MUFP - Multi User Firing point
MCR – Multi Classification Range
ECR – Electronic Classification Range
BIF – Battle Inoculation Facility

SITE FEATURES

October 2022 Sampling Event - Wide Bay Training Area, Queensland

FIGURE 2



AECOM

N

DATUM GDA 1994, PROJECTION MGA ZONE

0 50 100 200

metres

1:4,500 (when printed at A3)

LEGEND

- Waste Water Treatment Plant Sampling Location
- Abstraction Bore
- Groundwater sampling location
- Surface water sampling location
- Road
- WBTA Property Boundary
- WBTA Management Area

Note that not all sampling locations are shown for privacy reasons.

Wide Bay Training Area, Queensland

SAMPLING LOCATIONS (CAMP KERR)

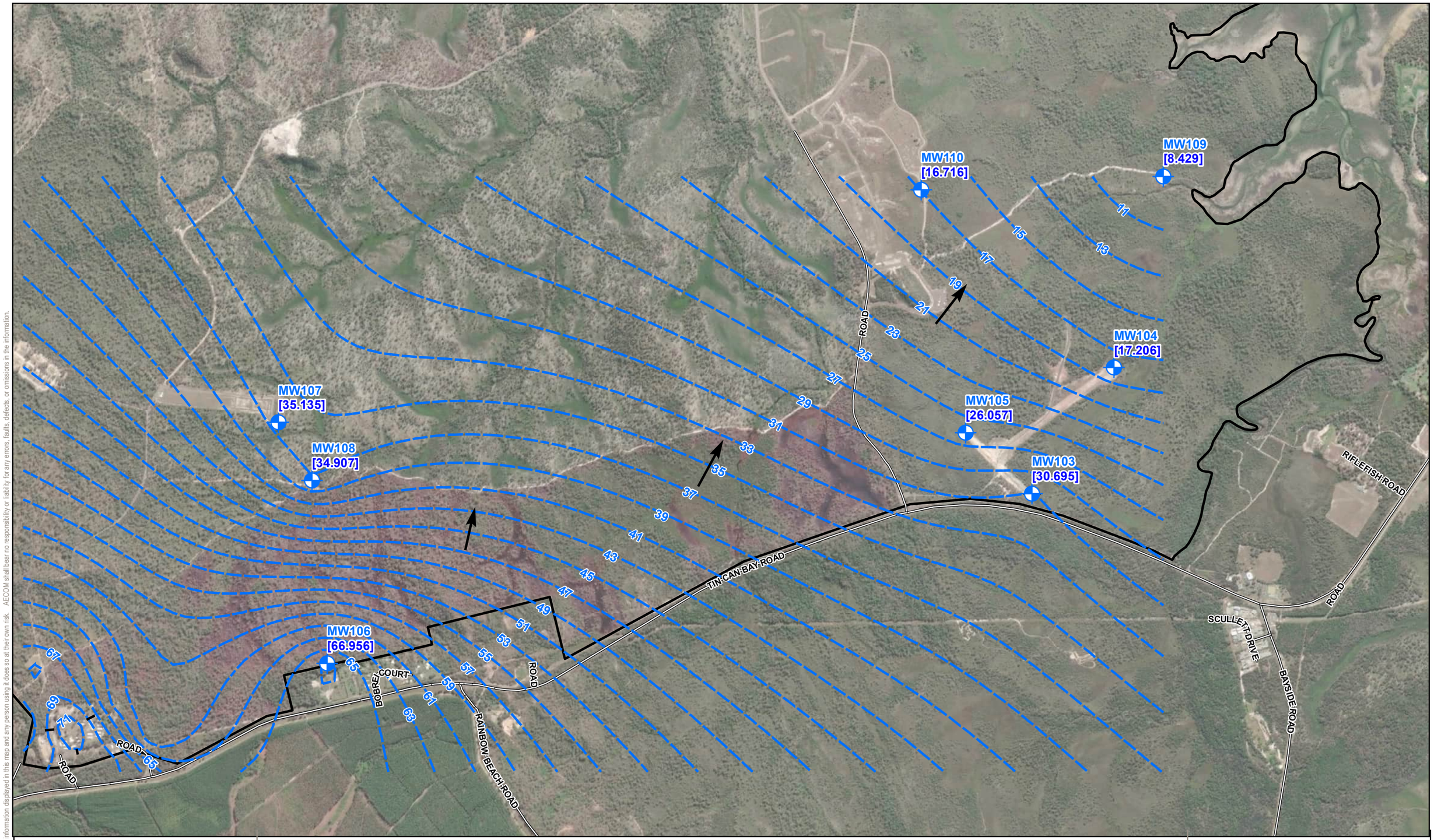
October 2022 Sampling Event

PROJECT ID	60612563
CREATED BY	JP
LAST MODIFIED	SCS-06/06/22
VERSION:	1

Figure

3

A3 size



AECOM

N

DATUM GDA 1994, PROJECTION MGA ZONE XX.

0 200 400 800

metres

1:20,000 (when printed at A3)

LEGEND

- Groundwater elevation (mAHD)
- Inferred Groundwater Contours (mAHD)
- Inferred Groundwater Flow Direction
- WBTA Property Boundary

Data sources:

Base Data: (c) 20XX (data source) (additional data)

Wide Bay Training Area, Queensland

INFERRED GROUNDWATER CONTOURS, GREATER WBTA

9 November 2022

PROJECT ID	60612563
CREATED BY	SkipworthS
LAST MODIFIED	SCS- 28/06/21
VERSION:	1

Figure 4

Filename:L:\Secure\Projects\606X\60612563\900_CAD_GIS\920_GIS\02_MXDs\WBTA\PFAS_OMP_WBTA Factual Report May 2022\WBTA_P60612563_F4_InferredGroundwaterContours_May2022_20221114v2.mxd

A3 size

MW111 [69.866]

MW120 [62.465]

CAMP KERR

MW117 [65.999]

MW116 [65.839]

MW119 [73.491]

WALLU

MW101 [68.675]

MW102 [68.868]

MW115 [68.062]

MW112 [59.321]

MW121 [63.099]

MW122 [65.439]

MW114 [68.781]

MW118 [68.533]

MW113 [65.704]

ROAD

CLYDE ROAD

TIN CAN BAY ROAD

60 61 62 63 64 65 66 67 68 69 70 71 72 73

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

AECOM

N

DATUM GDA 1994, PROJECTION MGA ZONE XX

0 35 70 140

metres

1:3,000 (when printed at A3)

LEGEND

- Groundwater Elevation (mAHD)
- Inferred Groundwater Contours (mAHD)
- Inferred Groundwater Flow Direction
- WBTA Property Boundary

Data sources:

Base Data: (c) 20XX (data source) (additional data)

Wide Bay Training Area, Queensland

INFERRED GROUNDWATER CONTOURS (CAMP KERR)

9 November 2022

PROJECT ID	60612563
CREATED BY	ScottA3
LAST MODIFIED	SCS- 26/06/21
VERSION:	2

Figure 5

Filename:L:\Secure\Projects\606X\60612563\900_CAD_GIS\920_GIS\02_MXDs\WBTA\PFAS_OMP_WBTA Factual Report May 2022\WBTA_P60612563_F5_OMP_InferredGWcontours_CampKerr_20221114v2.mxd

A3 size

Appendix B

Tables

Appendix B Tables

Property ID	Well ID	Hydrasleeve install date	Gauging and Sample date	Hydrasleeve target depth (mbtoc)	Screened Interval depth (mbgs)	Depth to Water (mbtoc)	TOC Elevation (mAHD)	Groundwater Elevation (mAHD)	Well Depth (mbtoc)	Condition of Stand up cover / Gatic	DO (mg/L)	EC (µS/cm)	pH	E_r (mV)	E_h (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method / Comments
0224	MW101	20/10/2022	21/10/2022	15.0	11 - 15	10.589	79.264	68.675	16.08	Good	2.48	235.2	5.43	93.9	298.9	22.3	Slightly turbid	Cloudy, brown sediment	No odour	No sheen	Hydrasleeve
0224	MW102	20/10/2022	21/10/2022	19.5	14-20	9.696	78.564	68.868	19.91	Good	3.9	131.8	5.03	103.7	308.7	23.8	Slightly turbid	Cloudy, brown sediment	No odour	No sheen	Hydrasleeve
0224	MW103	10/05/2022	18/10/2022	10.5	7.5 - 10.5	2.544	33.239	30.695	11.6	Good	3.95	99	5.55	110.2	315.2	22.7	Low	Clear, fine brown sediment	No odour	No sheen	Hydrasleeve
0224	MW104	10/05/2022	18/10/2022	11.0	8 - 11	3.609	20.815	17.206	12.035	Good	2.72	109.4	5.08	114.8	319.8	23.6	Low	Clear, red/orange sediment	No odour	No sheen	Hydrasleeve
0224	MW105	18/10/2022	19/10/2022	7.0	4.2 - 7.2	1.546	27.603	26.057	8.35	Good	1.77	621	6.45	59.3	264.3	21.4	Low	Clear, brown sediment	No odour	No sheen	Hydrasleeve
0224	MW106	12/05/2022	19/10/2022	10.0	4 - 10	2.512	69.468	66.956	11.05	Good	2.94	110.8	5.18	102	307	20.4	Medium-High	Cloudy, brown sediment	No odour	No sheen	Hydrasleeve, rootlets in hydrasleeve
0224	MW107	12/05/2022	19/10/2022	5.8	2.8 - 5.8	2.654	37.789	35.135	6.31	Good	1.55	211.2	5.48	62.2	267.2	-	Low-Medium	Cloudy, red/orange sediment	No odour	No sheen	Hydrasleeve
0224	MW108	12/05/2022	19/10/2022	17.5	14.5 - 17.5	5.083	39.99	34.907	18.475	Good	1.24	506	7.1	46.2	251.2	22	Medium-High	Clear, Black/grey sediment	No odour	No sheen	Hydrasleeve
0224	MW109	10/05/2022	18/10/2022	10.0	7 - 10	0.778	9.207	8.429	11.06	Good	0.95	250.8	6.02	93.8	298.8	23.6	Low	Clear/Cloudy, Brown Sediment	No odour	No sheen	Hydrasleeve
0224	MW110	10/05/2022	18/10/2022	3.5	0.5 - 4	1.251	17.967	16.716	4.535	Good	1.73	155.6	5.41	102.2	307.2	22	Low	Clear, brown sediment	No odour	No sheen	Hydrasleeve
0224	MW111	12/05/2022	19/10/2022	20.5	16.5 - 20.5	9.086	78.952	69.866	21.535	Good	1.55	236.8	5.68	60.7	265.7	21.4	Medium	Cloudy, brown sediment	No odour	No sheen	Hydrasleeve
0224	MW112	12/05/2022	20/10/202	9.0	6 - 9	5.862	65.183	59.321	9.87	Good	1.05	164.8	5.16	130.6	335.6	21.1	Medium	Cloudy	No odour	No sheen	Hydrasleeve
0224	MW113	12/05/2022	20/10/2022	8.0	6 - 9	2.013	67.717	65.704	9.015	Good	0.6	153.9	4.9	136.9	341.9	20.8	Low-Medium	Clear, brown sediment	No odour	No sheen	Hydrasleeve
0224	MW114	12/05/2022	20/10/2022	11.5	8.5 - 11.5	4.235	73.016	68.781	12.52	Good	2.34	72.5	5.49	129.4	334.4	21	Clear	Clear, brown sediment	No odour	No sheen	Hydrasleeve
0224	MW115	09/05/2022	17/10/2022	16.0	13 - 16	8.597	76.659	68.062	17.065	Good	3.28	252	6.06	85.2	290.2	21.2	Low	Clear, Brown Sediment	No odour	No sheen	Hydrasleeve
0224	MW116	12/05/2022	19/10/2022	11.0	8 - 11	3.976	69.815	65.839	11.795	Good	1.88	545.3	6.45	55	260	20.5	Medium	Cloudy, brown sediment	No odour	No sheen	Hydrasleeve
0224	MW117	12/05/2022	19/10/2022	10.0	7 - 10	2.915	68.914	65.999	11.01	Good	1.54	451.3	6.43	51.7	256.7	19.4	Medium	Cloudy, brown sediment	No odour	No sheen	Hydrasleeve
0224	MW118	12/05/2022	18/10/2022	12.7	10 - 13	7.621	76.154	68.533	13.59	Good	2.67	120.5	4.97	116.3	321.3	21.2	Medium-high	Cloudy/Brownish, red/orange sediment	No odour	No sheen	Hydrasleeve. Rootlets sitting in top of hydrasleeve
0224	MW119	09/05/2022	20/10/2022	14.7	13 - 16	6.055	79.546	73.491	15.76	Good	3.63	244.8	5.41	134.3	339.3	22.1	Medium	Cloudy, red sediment	No odour	No sheen	Hydrasleeve
0224	MW120	18/10/2022	20/10/2022	12.7	Unknown	8.867	71.332	62.465	14.5	Good	1.301	132.1	5.01	112.3	317.3	22.1	Med	Cloudy, brown sediment	No odour	No sheen	Hydrasleeve
0224	MW121	18/10/2022	20/10/2022	14.0	Unknown	7.306	70.405	63.099	14.4	Good	0.94	234.2	4.87	137.5	342.5	21.5	Clear	Low, brown sediment	No odour	No sheen	Hydrasleeve
0224	MW122	18/10/2022	20/10/2022	19.0	Unknown	5.136	70.575	65.439	19.4	Good	1	98.6	4.84	136.6	341.6	22.1	Clear	Clear, brown sediment	No odour	No sheen	Hydrasleeve
0224	POT001	-	20/10/2022	-	18 - 78.4	-	-	-	-	-	3.01	517	6.7	135	340	21.4	Clear	Clear	No odour	No sheen	Tap
0224	POT005	-	20/10/2022	-	30 - 51.5	-	-	-	-	-	1.76	480.5	6.9	119.3	324.3	22	Clear	Clear	No odour	No sheen	Tap

Notes
mbgs is metres below ground surface
mbtoc is metres below top of casing
mAHD is metres above Australian height datum
DO is dissolved oxygen
EC is electrical conductivity
E_h is oxidation reduction potential
Oxidation reduction potential (E_r) measured with a platinum electrode and a silver/silver chloride reference electrode (E_r) and converted to E_h by $E_h = E_r + 205$ mV (based on a groundwater temperature of 21°C)
Temp is Temperature
µS/cm is microsiemens per centimetre
ºC is degrees Celsius
mV is millivolts
` - No data

		PFHxS and PFOS	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTeDA	PFTrDA	FOSA	MeFOSE	EtFOSE	MeFOSA	EtFOSA	MFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Sum of PFAS
	Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.05	0.02	0.02	0.05	0.05	0.05	0.05	0.02	0.02	0.05	0.05	0.05	0.05	0.01
NEMP (HEPA, 2020) Human Health Drinking Water		**0.07**											**0.56**																		
NHMRC (2019) PFAS Recreational Water		2											10																		
NEMP (HEPA, 2020) Ecological Freshwater 99% Species Protection							*0.00023*						*19*																		
Location ID	**Sample ID**	**Sample Date**		**Lab Report No.**																											
MW101	0224_MW101_221022	22/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW102	0224_MW102_221021	21/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW103	0224_MW103_221018	18/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW104	0224_MW104_221018	18/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW105	0224_MW105_221019	19/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW106	0224_MW106_221019	19/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW107	0224_MW107_221019	19/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW108	0224_MW108_221019	19/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW109	0224_MW109_221018	18/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW110	0224_MW110_221018	18/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW111	0224_MW111_221019	19/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW112	0224_MW112_221020	20/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW113	0224_MW113_221020	20/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW114	0224_MW114_221020	20/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW115	0224_MW115_221017	17/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW116	0224_MW116_221019	19/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW117	0224_MW117_221019	19/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW118	0224_MW118_221018	18/10/2022	Normal	EB221148	0.02	<0.02	<0.02	0.01	<0.02	*0.01*	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.02
MW118	0224_QC131_221018	18/10/2022	Duplicate	EB221148	0.04	<0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.04
MW118	0224_QC231_221018	18/10/2022	Triplicate	AECO06_221026	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW119	0224_MW119_221020	20/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW120	0224_MW120_221020	20/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
MW121	0224_MW121_221020	20/10/2022	Normal	EB221148	**0.09**	<0.02	<0.02	0.06	<0.02	*0.03*	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.09
MW121	0224_QC134_221020	20/10/2022	Duplicate	EB221148	**0.09**	<0.02	<0.02	0.06	<0.02	*0.03*	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.09
MW121	0224_QC234_221020	20/10/2022	Triplicate	AECO06_221026	0.036	<0.01	<0.01	0.036	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.036
MW122	0224_MW122_221020	20/10/2022	Normal	EB221148	**0.19**	<0.02	<0.02	0.13	<0.02	*0.06*	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.19
MW122	0224_QC135_221020	20/10/2022	Duplicate	EB221148	**0.17**	<0.02	<0.02	0.12	<0.02	*0.05*	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.17
MW122	0224_QC235_221020	20/10/2022	Triplicate	AECO06_221026	**0.109**	<0.01	<0.02	0.085	<0.01	*0.024*	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.109
POT001	0224_POT001_221020	20/10/2022	Normal	EB221148	0.03	<0.02	<0.02	0.03	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	0.03
POT005	0224_POT005_221020	22/10/2022	Normal	EB221148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01

LOR is limit of reporting
µg/L is micrograms per litre
-' denotes no analysis undertaken
<' denotes concentration is less than
NEMP is National Environmental Management Plan
Denotes first time detection above LOR
Denotes new exceedance of human health guideline values

Property ID	Location ID	Sample Date	DO (mg/L)	EC (µS/cm)	pH	E_r (mV)	E_h (mV)	Temp (°C)	Turbidity	Odour	Sheen
0224	SW004	18/10/2022	3.99	172.8	6.07	108.8	313.8	22.7	Clear	No odour	No sheen
0224	SW005	18/10/2022	3.82	135	6.08	105.6	310.6	21.7	Slightly turbid, clear/brown	No odour	No sheen
0224	SW006	19/10/2022	4.2	144.6	6.78	86.3	291.3	21.8	Slightly turbid	No odour	No sheen
0224	SW007	18/10/2022	2.8	132	5.5	111.4	316.4	25	Low, clear	No odour	No sheen
0224	SW008	17/10/2022	4.25	25221	6.66	101.6	306.6	25.6	Clear	No odour	No sheen
0224	SW009	19/10/2022	4.72	213.7	6.36	55.9	260.9	21.9	Low-medium	No odour	No sheen
0224	SW012	17/10/2022	3.9	39340	7.25	57.5	262.5	24.9	Low, clear/brown	No odour	No sheen
0224	SW013	18/10/2022	4.62	24179	6.71	108.1	313.1	27.4	Low-medium, clear/brown	No odour	No sheen
0224	SW014	18/10/2022	3.56	545	6.7	95.2	300.2	25.6	Clear/brown	No odour	No sheen
0224	SW016	20/10/2022	5.52	167.7	4.91	152.6	357.6	21	Clear/brown, low turbidity	No odour	No sheen
0224	SW017	21/10/2022	6.50	39	6.55	92.3	297.3	22	Low	No odour	No sheen
0224	SW018	21/10/2022	6.07	34	6.31	94.5	299.5	22.3	Clear	No odour	No sheen
0224	SW019	20/10/2022	3.50	194.1	6.64	53.7	258.7	19.6	High, brown sediment	No odour	No sheen
0224	SW021	19/10/2022	3.61	188	6.55	51	256	20.5	low-medium, brown/clear	No odour	No sheen
0224	SW022	19/10/2022	1.4	119.5	5.09	62.2	267.2	20.5	Medium, brown	No odour	No sheen
0224	SW023	19/10/2022	1.05	105.5	6.19	61.4	266.4	20.3	Medium, brown	No odour	No sheen
0224	SW025	19/10/2022	2.74	151.8	6.4	48.7	253.7	20.2	Low, clearish/brown	No odour	No sheen
0224	SW027	19/10/2022	1	145.6	6.45	74.4	279.4	18.4	Turbid, brown	No odour	No sheen

Notes
DO is dissolved oxygen
EC is electrical conductivity
E_h is oxidation reduction potential

Oxidation reduction potential (E_r) measured with a platinum electrode and a silver/silver chloride reference electrode (E_r) and converted to E_h by $E_h = E_r + 205$ mV (based on a groundwater temperature of 21°C)
Temp is Temperature
µS/cm is microsiemens per centimetre
ºC is degrees Celsius
mV is millivolts
` - No data

		PFHxS and PFOS	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFPeA	PFHxA	PFHpA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSE	EtFOSE	MeFOSA	EtFOSA	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Sum of PFAS
	Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	0.0016	0.0005	0.0005	0.0005	0.0005	0.0003	0.0005	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.001	0.001	0.001	0.001	0.0005	0.0005	0.001	0.001	0.001	0.001	0.0016
NHMRC (2019) PFAS Recreational Water		2											10																		
HEPA (2020) Ecological Freshwater 99% Species Protection							**0.00023**						**19**																		
HEPA (2020)Ecological Freshwater 95% Species Protection (SW025 only)							*0.13*						*220*																		

Location ID	Sample ID	Sample Date	Type	Lab Report No.																												
SW004	0224_SW004_221018	18/10/2022	Normal	EB2231148	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW005	0224_SW005_221018	18/10/2022	Normal	EB2231148	<0.002	<0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW006	0224_SW006_221019	19/10/2022	Normal	EB2231148	<0.002	<0.008	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW006	0224_QC133_221019	19/10/2022	Duplicate	EB2231148	<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	<0.024	<0.01	<0.024	<0.024	<0.024	<0.024	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW006	0224_QC233_221019	19/10/2022	Triplicate	AECO06_221026	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW007	0224_SW007_221018	18/10/2022	Normal	EB2231148	<0.002	<0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW008	0224_SW008_221017	17/10/2022	Normal	EB2231148	<0.002	<0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW009	0224_SW009_221019	19/10/2022	Normal	EB2231148	<0.002	<0.028	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW012	0224_SW012_221017	17/10/2022	Normal	EB2231148	<0.002	<0.008	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW013	0224_SW013_221018	18/10/2022	Normal	EB2231148	0.009	<0.008	<0.002	0.005	<0.002	**0.004**	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.009
SW014	0224_SW014_221018	18/10/2022	Normal	EB2231148	<0.01	<0.02	<0.02	<0.01	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.05	<0.05	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.01
SW014	0224_QC130_221018	18/10/2022	Duplicate	EB2231148	0.003	<0.008	<0.002	0.003	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.003
SW014	0224_QC230_221018	18/10/2022	Triplicate	AECO06_221026	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
SW016	0224_SW016_221020	20/10/2022	Normal	EB2231148	<0.002	<0.006	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW017	0224_SW017_221021	21/10/2022	Normal	EB2231148	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW018	0224_SW018_221021	21/10/2022	Normal	EB2231148	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW019	0224_SW019_221020	20/10/2022	Normal	EB2231148	0.027	<0.014	<0.009	0.015	<0.009	**0.012**	<0.009	<0.04	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.022	<0.009	<0.022	<0.022	<0.022	<0.022	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	0.027
SW021	0224_SW021_221019	19/10/2022	Normal	EB2231150	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW022	0224_SW022_221019	19/10/2022	Normal	EB2231150	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW023	0224_SW023_221019	19/10/2022	Normal	EB2231149	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002
SW025	0224_SW025_221019	19/10/2022	Normal	EB2231148	0.003	<0.008	<0.002	<0.002	<0.002	0.003	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.003
SW027	0224_SW027_221019	19/10/2022	Normal	EB2231148	0.01	<0.024	<0.002	0.006	<0.002	**0.004**	<0.002	<0.01	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.002	<0.005	<0.005	<0.005	<0.005	<0.002	<0.002	<0.005	<0.005	<0.005	<0.005	0.01
SW027	0224_QC132_221019	19/10/2022	Duplicate	EB2231148	<0.005	<0.028	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.012	<0.012	<0.012	<0.012	<0.012	<0.012	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SW027	0224_QC232_221019	19/10/2022	Triplicate	AECO06_221026	<0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.05	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.01	<0.05	<0.05	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

LOR is limit of reporting
µg/L is micrograms per litre
-' denotes no analysis undertaken
<' denotes concentration is less than
Denotes first time detection above LOR
Denotes new exceedance of human health guideline values
In accordance with the SAQP, SW025 has been assessed with HEPA (2020) ecological guideline for the protection of freshwater species at 95%.

Property ID	Well ID	Sample Date	DO (mg/L)	EC (µS/cm)	pH	E_r (mV)	E_h (mV)	Temp (°C)	Turbidity	Water Colour	Odour	Sheen	Sample Method / Comments
0224	OTH001	20/10/2022	3.57	502.3	7.02	104.6	309.6	22.1	Clear	Clear	No odour	No sheen	Tap

DO is dissolved oxygen
EC is electrical conductivity
E_h is oxidation reduction potential
Oxidation reduction potential (E_r) measured with a platinum electrode and a silver/silver chloride reference electrode (E_r) and converted to E_h by $E_h = E_r + 205$ mV (based on a groundwater temperature of 21°C)
Temp is Temperature
µS/cm is microsiemens per centimetre
ºC is degrees Celsius
mV is millivolts

		PFHxS and PFOS	PFBS	PFPeS	PFHxS	PFHpS	PFOS	PFDS	PFBA	PFPeA	PFHpA	PFHxA	PFOA	PFNA	PFDA	PFUnDA	PFDoDA	PFTrDA	PFTeDA	FOSA	MeFOSE	EtFOSE	MeFOSA	EtFOSA	MeFOSAA	EtFOSAA	4:2 FTS	6:2 FTS	8:2 FTS	10:2 FTS	Sum of PFAS
	Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	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	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.1	0.02	0.02	0.02	0.01	0.02	0.02	0.02	0.02	0.02	0.05	0.02	0.05	0.05	0.05	0.05	0.02	0.02	0.05	0.05	0.05	0.05	0.01
NHMRC (2019) PFAS Recreational Water		2											10																		
HEPA (2020) Ecological Freshwater 99% Species Protection							*0.00023*						*19*																		

Location ID	Sample ID	Sample Date	Type	Lab Report No.																												
OTH001	0224_OTH001_220825	25/08/2022	Normal	EB2225015	0.02	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02
OTH001	0224_QC130_220825	25/08/2022	Duplicate	EB2225015	0.02	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02
OTH001	0224_QC230_220825	25/08/2022	Triplicate	ES2231048	0.02	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02
OTH001	0224_OTH001_221020	20/10/2022	Normal	EB2231148	0.02	<0.02	<0.02	0.02	<0.02	<0.01	<0.02	<0.1	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.05	<0.05	<0.02	<0.02	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.02

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µg/L is micrograms per litre
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Denotes first time detection above LOR
Denotes new exceedance of human health guideline values

Appendix C

Analytical Data Validation

Appendix C Analytical Data Validation

DATA VALIDATION REPORT

Project No.:	60612563	**Validation by:** JS	**Date:** 15/11/2022
Client:	Department of Defence		
Site:	Wide Bay Training Area		
Matrix type:	Groundwater, surface water, waste water	**Data verified by:** JP	**Date:** 16/11/2022
No. of primary samples:	24 groundwater, 18 surface water, 2 waste water		
Laboratory:	ALS (Brisbane), ALS (Sydney), NMI (Sydney)	**Project Manager:** JP	
Lab reference:	EB2225015; ES2231048; EB2231148; EB2231149, EB2231150; AECO06_221026 (RN1370853)		

Key Issues:	No QA/QC issues were identified in the field or laboratory datasets that could have a material implication on data interpretation and therefore decision-making on the project. The data are therefore considered appropriate for use to meet the project objectives. All analytical data have been uploaded and assigned to DERP ESdat.

Field QA/QC

Sampling personnel	Sampling was conducted by an AECOM environmental scientist on 25 August 2022 and between 17 and 21 October 2022.
Sampling Methodology	Samples were collected using appropriate methods as identified within the main body of the report.
Hydrasleeve sampling	All hydrasleeves were left in the monitoring wells for a minimum of 24 hours prior to being sampled. Installation and retrieval dates are shown in **Table T1** in **Appendix B**.
Daily Equipment Calibration	Daily equipment calibration was completed during the sampling event and are attached within **Appendix F**. EC would not calibrate within tolerance on 17 and 19 October 2022. As the variance recorded was minor, it is considered that there was be minimal impact on the EC results.
Chain of Custody (COC)	COC documents were completed as per AECOM procedures and are attached within **Appendix D**.
Rinsate Blank (refer to **Table C1**)	Rinsate blank samples were collected at a frequency of approximately one per day of sampling (five in total) where non-dedicated sampling equipment was used. All rinsates were collected from the decontaminated interface probe. Concentrations reported below the LOR for all analytes tested.
Frequency of field QC	Field duplicate (intra-laboratory duplicates) and triplicates (inter-laboratory duplicates) were collected for samples analysed for PFAS at a frequency of one in ten primary samples (seven sets for 44 water samples [16%]. The frequency of field QC achieves the expected frequency.
Handling and preservation	Primary, duplicate and triplicate samples were received preserved and chilled at the laboratory. All samples were received at the laboratory in appropriate sample containers with no sample container / preservation non-compliances noted.

Laboratory QA/QC	
Tests requested/reported	Samples were analysed and reported as requested on the COC.
Holding time compliance	Samples were extracted and analysed within recommended holding times.
Laboratory Accreditation	The laboratory analysis was conducted by ALS Environmental Pty Ltd (Brisbane) a National Association of Testing Authorities (NATA) accredited laboratory. The triplicate samples were analysed at the National Measurement Institute (Sydney), also a NATA accredited laboratory.
Frequency of laboratory QC	The laboratory reported a sufficient frequency of quality control samples to assess whether the results have been reported to an acceptable accuracy and precision, except: • Laboratory duplicates for PFAS were below the expected rate of 10.00% in: - ES2231048 (1 samples in batch, 8.33% rate achieved) - EB2231148 (38 samples in batch, 2.6% rate achieved) - EB2231149 (6 samples in batch, 0.0% rate achieved) - EB2231150 (6 samples in batch, 0.0% rate achieved) • Matrix spikes for PFAS (0.00%) below the expected rate of 5.00% in: - EB2231148 (38 samples in batch - EB2231149 (6 samples in batch) - EB2231150 (6 samples in batch) The reason for insufficient matrix spikes and laboratory duplicates for these batches is due to the way the laboratory assigns the duplicates and matrix spikes and the availability of additional bottles. The laboratory LIMS assigns laboratory QC to samples in the analytical run; however, the runs may not allocate samples to allow for frequency compliance. However, as all other laboratory QC results met control limits this is not expected to impact data quality.
Method Blank	No method blank non-conformances were reported in the batches.
Laboratory duplicate RPDs	Laboratory duplicate relative percentage differences (RPD) were within control limits for all samples.
Laboratory control spike recovery	Two non-compliances were reported for Laboratory Control Spikes (LCS): • EB2231148 FOSA where LCS recovery was greater than the upper control limit (141% compared to 137%) • EB2231148 MeFOSA where LCS recovery was greater than the upper control limit (147% compared to 141%). As neither of these compounds have been detected at WBTA, the marginal exceedances of the LCS recovery limits are not considered to be of significance.
Matrix spike recovery	There was one non-conformance of the matrix spike recovery. This was for EB2225015 where the recovery of MeFOSA was greater than the upper data quality objective (152% compared to 130%). As this compound has not been detected at WBTA, the non-conformance for MeFOSA is not considered to be of significance. The laboratory report stated that the high matrix spike recovery for MeFOSA was deemed acceptable as all associated analyte results are less than the limit of reporting.
Surrogate spike recovery	Surrogate spike recoveries were within control limits.
QA/QC Data Evaluation	
Comparison of Field Observations and Laboratory Results	No anomalous results between field observations and analysis results were noted.

Data transcription	A random 10% check of the laboratory results identified no anomalies within the electronic data, the laboratory reports, and tables generated by AECOM.
Limits of reporting	LORs were not low enough to enable assessment against adopted screening levels except for PFOS for HEPA (2020) ecological guideline values for the 99% protection of freshwater species. The potential exists for concentrations of PFOS to be above the adopted guideline, but below the laboratory LOR. This should be taken into consideration when interpreting and using this data quantitatively where results are reported below LOR.
Field duplicate RPDs (refer to **Tables C2, C3**, and **C4**)	Field duplicate RPDs were reported within control limits for all primary and duplicate samples.
Field triplicate RPDs (refer to **Tables C2, C3**, and **C4**)	Field triplicate RPDs were reported within control limits for all primary and triplicate samples.
Other	
Other observations	Monitoring well MW109 is located within 50m of a tributary of Snapper Creek that is likely to be tidally influenced. Due to this proximity, MW109 has the potential to have some tidal variations in groundwater levels. However, due to the large distance covered by the monitoring network (>8 km) between Wallu and the Base eastern boundary, the presence of minor fluctuations in groundwater level in MW109 due to tidal influence (if present) would have a minimal impact on the groundwater contour interpretation due to the large change in piezometric surface, which falls from 73.49 mAHD in Camp Kerr to 8.43 mAHD at MW109. Laboratory report EB2231148, reported raised limits of reporting for PFBS for particular samples due to matrix interference. Some samples required dilution prior to extraction due to matrix interference with limit of reporting adjusted accordingly.

Table C1
Rinsate Analytical Results

AECOM Imagine it. Delivered.

Lab Report Number		EB2231148	EB2231148	EB2231148	EB2231148	EB2231148
Field ID		0224_QC318_221017	0224_QC319_221018	0224_QC320_221019	0224_QC321_221020	0224_QC322_221021
Sampled_Date		18/10/2022	18/10/2022	21/10/2022	21/10/2022	21/10/2022
Sample Type		Rinsate	Rinsate	Rinsate	Rinsate	Rinsate
Chemical Name	**Units**	**EQL**					
Perfluorobutane sulfonic acid (PFBS)	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
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	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
Perfluoropentanoic acid (PFPeA)	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
Perfluoroheptanoic acid (PFHpA)	µg/L	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	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
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.02	<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	<0.02
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluorooctane sulfonamide (FOSA)	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
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-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<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	<0.02
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 sulfonic acid (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
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Table C2 Groundwater Duplicate and Triplicate Analytical Results

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Lab Report Number		EB2231148	EB2231148		EB2231148	RN1370853		EB2231148	EB2231148		EB2231148	RN1370853		EB2231148	EB2231148		EB2231148	RN1370853	
Field ID		0224_MW118_221018	0224_QC131_221018	**RPD**	0224_MW118_221018	0224_QC231_221018	**RPD**	0224_MW121_221020	0224_QC134_221020	**RPD**	0224_MW121_221020	0224_QC234_221020	**RPD**	0224_MW122_221020	0224_QC135_221020	**RPD**	0224_MW122_221020	0224_QC235_221020	**RPD**
Sample Type		Primary	Duplicate		Primary	Triplicate		Primary	Duplicate		Primary	Triplicate		Primary	Duplicate		Primary	Triplicate	
Sampled Date		18/10/2022	18/10/2022		18/10/2022	18/10/2022		20/10/2022	20/10/2022		20/10/2022	20/10/2022		20/10/2022	20/10/2022		20/10/2022	20/10/2022	
Chemical Name	**Units**	**EQL**																	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	0.02	0	<0.02	<0.01	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.002 : 0.01 (Interlab)	0.01	0.02	67	0.01	<0.01	0	0.06	0.06	0	0.06	0.036	50	0.13	0.12	8	0.13	0.085	42
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.002 : 0.02 (Interlab)	0.01	0.02	67	0.01	<0.02	0	0.03	0.03	0	0.03	<0.02	40	0.06	0.05	18	0.06	0.024	86
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorobutanoic acid (PFBA)	µg/L	0.01 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0	<0.1	<0.1	0	<0.1	<0.05	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.002 : 0.02 (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	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorooctanoic acid (PFOA)	µg/L	0.002 : 0.01 (Interlab)	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.002 : 0.02 (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	<0.02	<0.02	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.005 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.005 : 0.05 (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	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.005 : 0.05 (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	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.005 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0	<0.05	<0.05	0	<0.05	<0.02	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.005 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.02	0	<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 (MeFOSAA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0	<0.02	<0.02	0	<0.02	<0.01	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.005 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.005 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.005 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.005 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0	<0.05	<0.05	0	<0.05	<0.01	0

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

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: no limit (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

Table C3 Surface Water Duplicate and Triplicate Analytical Results

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Lab Report Number		EB2231148	EB2231148		EB2231148	RN1370853		EB2231148	EB2231148		EB2231148	RN1370853		EB2231148	RN1370853		EB2231150	EB2231148	
Field ID		0224_SW006_221019	0224_QC133_221019	**RPD**	0224_SW006_221019	0224_QC233_221019	**RPD**	0224_SW014_221018	0224_QC130_221018	**RPD**	0224_SW014_221018	0224_QC230_221018	**RPD**	0224_SW027_221019	0224_QC232_221019	**RPD**	0224_SW027_221019	0224_QC132_221019	**RPD**
Sample Type		Primary	Duplicate		Primary	Triplicate		Primary	Duplicate		Primary	Triplicate		Primary	Duplicate		Primary	Triplicate	
Sampled Date		20/10/2022	20/10/2022		20/10/2022	20/10/2022		18/10/2022	18/10/2022		18/10/2022	18/10/2022		20/10/2022	20/10/2022		20/10/2022	20/10/2022	
Chemical Name	**Units**	**EQL**																	
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.002 : 0.01 (Interlab)	<0.008	<0.01	0	<0.008	<0.01	0	<0.02	<0.008	0	<0.02	<0.01	0	<0.024	<0.01	0	<0.024	<0.028	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.002 : 0.01 (Interlab)	<0.002	<0.01	0	<0.002	<0.01	0	<0.02	<0.002	0	<0.02	<0.01	0	<0.002	<0.01	0	<0.002	<0.005	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.002 : 0.01 (Interlab)	<0.002	<0.01	0	<0.002	<0.01	0	<0.01	0.003	0	<0.01	<0.01	0	0.006	<0.01	0	0.006	<0.005	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.002 : 0.01 (Interlab)	<0.002	<0.01	0	<0.002	<0.01	0	<0.02	<0.002	0	<0.02	<0.01	0	<0.002	<0.01	0	<0.002	<0.005	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.002 : 0.02 (Interlab)	<0.002	<0.01	0	<0.002	<0.02	0	<0.01	<0.002	0	<0.01	<0.02	0	0.004	<0.02	0	0.004	<0.005	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.002 : 0.01 (Interlab)	<0.002	<0.01	0	<0.002	<0.01	0	<0.02	<0.002	0	<0.02	<0.01	0	<0.002	<0.01	0	<0.002	<0.005	0
Perfluorobutanoic acid (PFBA)	µg/L	0.01 : 0.05 (Interlab)	<0.01	<0.05	0	<0.01	<0.05	0	<0.1	<0.01	0	<0.1	<0.05	0	<0.01	<0.05	0	<0.01	<0.02	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.002 : 0.02 (Interlab)	<0.002	<0.01	0	<0.002	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.002	<0.02	0	<0.002	<0.005	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.002 : 0.01 (Interlab)	<0.002	<0.01	0	<0.002	<0.01	0	<0.02	<0.002	0	<0.02	<0.01	0	<0.002	<0.01	0	<0.002	<0.005	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.002 : 0.01 (Interlab)	<0.002	<0.01	0	<0.002	<0.01	0	<0.02	<0.002	0	<0.02	<0.01	0	<0.002	<0.01	0	<0.002	<0.005	0
Perfluorooctanoic acid (PFOA)	µg/L	0.002 : 0.01 (Interlab)	<0.002	<0.01	0	<0.002	<0.01	0	<0.01	<0.002	0	<0.01	<0.01	0	<0.002	<0.01	0	<0.002	<0.005	0
Perfluorononanoic acid (PFNA)	µg/L	0.002 : 0.01 (Interlab)	<0.002	<0.01	0	<0.002	<0.01	0	<0.02	<0.002	0	<0.02	<0.01	0	<0.002	<0.01	0	<0.002	<0.005	0
Perfluorodecanoic acid (PFDA)	µg/L	0.002 : 0.01 (Interlab)	<0.002	<0.01	0	<0.002	<0.01	0	<0.02	<0.002	0	<0.02	<0.01	0	<0.002	<0.01	0	<0.002	<0.005	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.002 : 0.01 (Interlab)	<0.002	<0.01	0	<0.002	<0.01	0	<0.02	<0.002	0	<0.02	<0.01	0	<0.002	<0.01	0	<0.002	<0.005	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.002 : 0.01 (Interlab)	<0.002	<0.01	0	<0.002	<0.01	0	<0.02	<0.002	0	<0.02	<0.01	0	<0.002	<0.01	0	<0.002	<0.005	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.002 : 0.02 (Interlab)	<0.002	<0.01	0	<0.002	<0.02	0	<0.02	<0.002	0	<0.02	<0.02	0	<0.002	<0.02	0	<0.002	<0.005	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.005 : 0.02 (Interlab)	<0.005	<0.024	0	<0.005	<0.02	0	<0.05	<0.005	0	<0.05	<0.02	0	<0.005	<0.02	0	<0.005	<0.012	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.002 : 0.01 (Interlab)	<0.002	<0.01	0	<0.002	<0.01	0	<0.02	<0.002	0	<0.02	<0.01	0	<0.002	<0.01	0	<0.002	<0.005	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.005 : 0.05 (Interlab)	<0.005	<0.024	0	<0.005	<0.05	0	<0.05	<0.005	0	<0.05	<0.05	0	<0.005	<0.05	0	<0.005	<0.012	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.005 : 0.05 (Interlab)	<0.005	<0.024	0	<0.005	<0.05	0	<0.05	<0.005	0	<0.05	<0.05	0	<0.005	<0.05	0	<0.005	<0.012	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.005 : 0.02 (Interlab)	<0.005	<0.024	0	<0.005	<0.02	0	<0.05	<0.005	0	<0.05	<0.02	0	<0.005	<0.02	0	<0.005	<0.012	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.005 : 0.02 (Interlab)	<0.005	<0.024	0	<0.005	<0.02	0	<0.05	<0.005	0	<0.05	<0.02	0	<0.005	<0.02	0	<0.005	<0.012	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.002 : 0.01 (Interlab)	<0.002	<0.01	0	<0.002	<0.01	0	<0.02	<0.002	0	<0.02	<0.01	0	<0.002	<0.01	0	<0.002	<0.005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.002 : 0.01 (Interlab)	<0.002	<0.01	0	<0.002	<0.01	0	<0.02	<0.002	0	<0.02	<0.01	0	<0.002	<0.01	0	<0.002	<0.005	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.005 : 0.01 (Interlab)	<0.005	<0.01	0	<0.005	<0.01	0	<0.05	<0.005	0	<0.05	<0.01	0	<0.005	<0.01	0	<0.005	<0.005	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.005 : 0.01 (Interlab)	<0.005	<0.01	0	<0.005	<0.01	0	<0.05	<0.005	0	<0.05	<0.01	0	<0.005	<0.01	0	<0.005	<0.005	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.005 : 0.01 (Interlab)	<0.005	<0.01	0	<0.005	<0.01	0	<0.05	<0.005	0	<0.05	<0.01	0	<0.005	<0.01	0	<0.005	<0.005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.005 : 0.01 (Interlab)	<0.005	<0.01	0	<0.005	<0.01	0	<0.05	<0.005	0	<0.05	<0.01	0	<0.005	<0.01	0	<0.005	<0.005	0

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

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: no limit (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

Table C4 Wastewater Duplicate and Triplicate Analytical Results

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Lab Report Number	EB2225015	EB2225015		EB2225015	ES2231048	
Field ID	0224_OTH001_221020	0224_QC130_220825	RPD	0224_OTH001_221020	0224_QC230_220825	RPD
Sample Type	Primary	Duplicate		Primary	Triplicate	
Sampled Date	25/08/2022	25/08/2022		25/08/2022	25/08/2022	
Chemical Name	**Units**	**EQL**						
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.002 : 0.01 (Interlab)	0.02	0.02	0	0.02	0.02	0
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.002 : 0.02 (Interlab)	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorodecane sulfonic acid (PFDS)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorobutanoic acid (PFBA)	µg/L	0.01 : 0.05 (Interlab)	<0.1	<0.1	0	<0.1	<0.1	0
Perfluoropentanoic acid (PFPeA)	µg/L	0.002 : 0.02 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorohexanoic acid (PFHxA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroheptanoic acid (PFHpA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorooctanoic acid (PFOA)	µg/L	0.002 : 0.01 (Interlab)	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorononanoic acid (PFNA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorodecanoic acid (PFDA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.002 : 0.02 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.005 : 0.02 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
Perfluorooctane sulfonamide (FOSA)	µg/L	0.002 : 0.01 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	µg/L	0.005 : 0.05 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.005 : 0.05 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.005 : 0.02 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.005 : 0.02 (Interlab)	<0.02	<0.02	0	<0.02	<0.02	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.002 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.002 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.005 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	µg/L	0.005 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.005 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.005 : 0.01 (Interlab)	<0.05	<0.05	0	<0.05	<0.05	0

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

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: no limit (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

Appendix D

Chain of Custody Forms

Appendix D Chain of Custody Forms

CHAIN OF CUSTODY

ALS COC#: 43772 *ALS Laboratory:* EB Brisbane

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 21/10/22 16:10	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: WBTA (onsite & offsite - non land holder)

ORDER NO: 60612563_4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

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	Optional LL PFAS for GW/SW WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0224_MW115_221017		17/10/2022 07:53 PM	Water	ALS: 2 Non ALS: 0	No		X		
002	0224_SW008_221017		17/10/2022 07:55 PM	Water	ALS: 2 Non ALS: 0	No	X			
003	0224_SW012_221017		17/10/2022 07:56 PM	Water	ALS: 2 Non ALS: 0	No	X			
004	0224_MW109_221018		18/10/2022 10:03 AM	Water	ALS: 2 Non ALS: 0	No		X		
005	0224_SW004_221018		18/10/2022 05:43 PM	Water	ALS: 2 Non ALS: 0	No	X			
006	0224_MW104_221018		18/10/2022 06:46 PM	Water	ALS: 2 Non ALS: 0	No		X		
007	0224_SW014_221018		18/10/2022 06:47 PM	Water	ALS: 2 Non ALS: 0	No		X		
008	0224_MW110_221018		18/10/2022 06:48 PM	Water	ALS: 2 Non ALS: 0	No		X		
009	0224_SW005_221018		18/10/2022 06:50 PM	Water	ALS: 2 Non ALS: 0	No	X	X		

Environmental Division
Brisbane
Work Order Reference
EB2231148

Telephone : +61-7-3243 7222

CHAIN OF CUSTODY

COC#: 43772 *ALS Laboratory:* EB Brisbane

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

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: WBTA (onsite & offsite - non land holder)

ORDER NO: 60612563_4.1

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: [redacted]

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Optional LL PFAS for GW/SW WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
010	0224_SW013_221018		18/10/2022 06:51 PM	Water	ALS: 2 Non ALS: 0	No	X			
011	0224_MW103_221018		18/10/2022 06:53 PM	Water	ALS: 2 Non ALS: 0	No		X		
012	0224_QC130_221018		18/10/2022 06:59 PM	Water	ALS: 2 Non ALS: 0	No	X	X		
013	0224_MW118_221018		18/10/2022 07:03 PM	Water	ALS: 2 Non ALS: 0	No		X		
014	0224_QC131_221018		18/10/2022 07:04 PM	Water	ALS: 2 Non ALS: 0	No		X		
015	0224_QC318_221017		18/10/2022 07:07 PM	Water	ALS: 2 Non ALS: 0	No		X		
016	0224_QC319_221018		18/10/2022 07:09 PM	Water	ALS: 2 Non ALS: 0	No		X		
017	0224_SW007_221018		18/10/2022 07:11 PM	Water	ALS: 2 Non ALS: 0	No	X	X		
018	0224_MW105_221019		19/10/2022 11:07 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 43772 *ALS Laboratory:* EB Brisbane

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

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: WBTA (onsite & offsite - non land holder)

ORDER NO: 60612563_4.1

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	Optional LL PFAS for GW/SW WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
019	0224_SW009_221019		19/10/2022 11:08 PM	Water	ALS: 2 Non ALS: 0	No	X			
020	0224_SW025_221019		19/10/2022 11:10 PM	Water	ALS: 2 Non ALS: 0	No	X			
021	0224_MW107_221019		19/10/2022 11:11 PM	Water	ALS: 2 Non ALS: 0	No		X		
022	0224_MW116_221019		19/10/2022 11:13 PM	Water	ALS: 2 Non ALS: 0	No		X		
023	0224_SW006_221019		19/10/2022 11:15 PM	Water	ALS: 2 Non ALS: 0	No	X			
024	0224_MW108_221019		19/10/2022 11:19 PM	Water	ALS: 2 Non ALS: 0	No		X		
025	0224_MW111_221019		19/10/2022 11:20 PM	Water	ALS: 2 Non ALS: 0	No		X		
026	0224_MW106_221019		19/10/2022 11:22 PM	Water	ALS: 2 Non ALS: 0	No		X		
027	0224_QC132_221019		19/10/2022 11:51 PM	Water	ALS: 2 Non ALS: 0	No	X			

CHAIN OF CUSTODY

COC#: 43772 *ALS Laboratory:* EB Brisbane

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

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: WBTA (onsite & offsite - non land holder)

ORDER NO: 60612563_4.1

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: [redacted]

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Optional LL PFAS for GW/SW WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
028	0224_QC133_221019		19/10/2022 11:53 PM	Water	ALS: 2 Non ALS: 0	No	X			
029	0224_SW027_221019		20/10/2022 12:02 AM	Water	ALS: 2 Non ALS: 0	No	X			
030	0224_MW112_221020		20/10/2022 08:21 PM	Water	ALS: 2 Non ALS: 0	No		X		
031	0224_MW121_221020		20/10/2022 08:22 PM	Water	ALS: 2 Non ALS: 0	No		X		
032	0224_MW120_221020		20/10/2022 08:24 PM	Water	ALS: 2 Non ALS: 0	No		X		
033	0224_OTH001_221020		20/10/2022 08:25 PM	Water	ALS: 2 Non ALS: 0	No		X		
034	0224_SW016_221020		20/10/2022 08:26 PM	Water	ALS: 2 Non ALS: 0	No	X			
035	0224_MW119_221020		20/10/2022 08:28 PM	Water	ALS: 2 Non ALS: 0	No		X		
036	0224_MW122_221020		20/10/2022 08:29 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

COC#: **43772** *ALS Laboratory:* EB Brisbane

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

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: WBTA (onsite & offsite - non land holder)

ORDER NO: 60612563_4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

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	Optional LL PFAS for GW/SW WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
037	0224_MW113_221020		20/10/2022 08:30 PM	Water	ALS: 2 Non ALS: 0	No		X		
038	0224_PT001_221020		20/10/2022 08:31 PM	Water	ALS: 2 Non ALS: 0	No		X		
039	0224_PT005_221020		20/10/2022 08:32 PM	Water	ALS: 2 Non ALS: 0	No		X		
040	0224_MW117_221019		20/10/2022 08:34 PM	Water	ALS: 2 Non ALS: 0	No		X		
041	0224_SW019_221020		20/10/2022 08:35 PM	Water	ALS: 2 Non ALS: 0	No	X			
042	0224_MW114_221020		20/10/2022 08:36 PM	Water	ALS: 2 Non ALS: 0	No		X		
043	0224_QC320_221019		20/10/2022 11:13 PM	Water	ALS: 2 Non ALS: 0	No		X		
044	0224_QC134_221020		20/10/2022 11:16 PM	Water	ALS: 2 Non ALS: 0	No		X		
045	0224_QC135_221020		20/10/2022 11:20 PM	Water	ALS: 2 Non ALS: 0	No		X		

CHAIN OF CUSTODY

ALS COC#: 43772 *ALS Laboratory:* EB Brisbane

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

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: WBTA (onsite & offsite - non land holder)

ORDER NO: 60612563_4.1

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: / ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

SAMPLE DETAILS							ANALYSIS REQUIRED			
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Optional LL PFAS for GW/SW WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
046	0224_SW018_221021		21/10/2022 01:52 PM	Water	ALS: 2 Non ALS: 0	No	X			
047	0224_MW101_221022		21/10/2022 01:53 PM	Water	ALS: 2 Non ALS: 0	No		X		
048	0224_MW102_221021		21/10/2022 01:54 PM	Water	ALS: 2 Non ALS: 0	No		X		
049	0224_SW017_221021		21/10/2022 01:55 PM	Water	ALS: 2 Non ALS: 0	No	X			
050	0224_QC321_221020		21/10/2022 02:33 PM	Water	ALS: 2 Non ALS: 0	No		X		
051	0224_QC322_221021		21/10/2022 02:34 PM	Water	ALS: 2 Non ALS: 0	No		X		

EXTRA SAMPLE

52 SW007 INCORRECT LOCATION ON HOLD.

CHAIN OF CUSTODY

ALS COC#: 43772 ALS Laboratory: EB Brisbane

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

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: WBTA (onsite & offsite - non land holder)

ORDER NO: 60612563_4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

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	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0224_MW115_221017	HDPE (no PTFE)	20 mL	00350621028632	Grey	No	
001	0224_MW115_221017	HDPE (no PTFE)	20 mL	00350621028565	Grey	No	
002	0224_SW008_221017	HDPE (no PTFE)	20 mL	00350520004334	Grey	No	
002	0224_SW008_221017	HDPE (no PTFE)	20 mL	00350520004324	Grey	No	
003	0224_SW012_221017	HDPE (no PTFE)	20 mL	00350520004374	Grey	No	
003	0224_SW012_221017	HDPE (no PTFE)	20 mL	00350520004327	Grey	No	
004	0224_MW109_221018	HDPE (no PTFE)	20 mL	00350621046029	Grey	No	
004	0224_MW109_221018	HDPE (no PTFE)	20 mL	00350621046004	Grey	No	
005	0224_SW004_221018	HDPE (no PTFE)	20 mL	00350520004418	Grey	No	
005	0224_SW004_221018	HDPE (no PTFE)	20 mL	00350520004358	Grey	No	
006	0224_MW104_221018	HDPE (no PTFE)	20 mL	00350621046059	Grey	No	
006	0224_MW104_221018	HDPE (no PTFE)	20 mL	00350621046183	Grey	No	
007	0224_SW014_221018	HDPE (no PTFE)	20 mL	00350520004372	Grey	No	
007	0224_SW014_221018	HDPE (no PTFE)	20 mL	00350520004384	Grey	No	
008	0224_MW110_221018	HDPE (no PTFE)	20 mL	00350621046192	Grey	No	
008	0224_MW110_221018	HDPE (no PTFE)	20 mL	00350621046113	Grey	No	
009	0224_SW005_221018	HDPE (no PTFE)	20 mL	00350520004637	Grey	No	
009	0224_SW005_221018	HDPE (no PTFE)	20 mL	00350520004394	Grey	No	
010	0224_SW013_221018	HDPE (no PTFE)	20 mL	00350520004335	Grey	No	
010	0224_SW013_221018	HDPE (no PTFE)	20 mL	00350520004337	Grey	No	
011	0224_MW103_221018	HDPE (no PTFE)	20 mL	00350621045896	Grey	No	
011	0224_MW103_221018	HDPE (no PTFE)	20 mL	00350621046021	Grey	No	
012	0224_QC130_221018	HDPE (no PTFE)	20 mL	00350520004433	Grey	No	
012	0224_QC130_221018	HDPE (no PTFE)	20 mL	00350520004465	Grey	No	
013	0224_MW118_221018	HDPE (no PTFE)	20 mL	00350621045875	Grey	No	
013	0224_MW118_221018	HDPE (no PTFE)	20 mL	00350621045780	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 43772 *ALS Laboratory:* EB Brisbane

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: WBTA (onsite & offsite - non land holder)

ORDER NO: 60612563_4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER: [redacted]

CONTACT PH: SAMPLER MOBILE:

QUOTE NO: SY/139/19 V3 / ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

014	0224_QC131_221018	HDPE (no PTFE)	20 mL	00350621046014	Grey	No	
014	0224_QC131_221018	HDPE (no PTFE)	20 mL	00350621045804	Grey	No	
015	0224_QC318_221017	HDPE (no PTFE)	20 mL	00350621045792	Grey	No	
015	0224_QC318_221017	HDPE (no PTFE)	20 mL	00350621046012	Grey	No	
016	0224_QC319_221018	HDPE (no PTFE)	20 mL	00350621045938	Grey	No	
016	0224_QC319_221018	HDPE (no PTFE)	20 mL	00350621045723	Grey	No	
017	0224_SW007_221018	HDPE (no PTFE)	20 mL	00350520004353	Grey	No	
017	0224_SW007_221018	HDPE (no PTFE)	20 mL	00350520004342	Grey	No	
018	0224_MW105_221019	HDPE (no PTFE)	20 mL	00350621046102	Grey	No	
018	0224_MW105_221019	HDPE (no PTFE)	20 mL	00350621046091	Grey	No	
019	0224_SW009_221019	HDPE (no PTFE)	20 mL	00350520004400	Grey	No	
019	0224_SW009_221019	HDPE (no PTFE)	20 mL	00350520004368	Grey	No	
020	0224_SW025_221019	HDPE (no PTFE)	20 mL	00350719018292	Grey	No	
020	0224_SW025_221019	HDPE (no PTFE)	20 mL	00350719018294	Grey	No	
021	0224_MW107_221019	HDPE (no PTFE)	20 mL	00350621046120	Grey	No	
021	0224_MW107_221019	HDPE (no PTFE)	20 mL	00350621045808	Grey	No	
022	0224_MW116_221019	HDPE (no PTFE)	20 mL	00350621045950	Grey	No	
022	0224_MW116_221019	HDPE (no PTFE)	20 mL	00350621046026	Grey	No	
023	0224_SW006_221019	HDPE (no PTFE)	20 mL	00350520004377	Grey	No	
023	0224_SW006_221019	HDPE (no PTFE)	20 mL	00350520004392	Grey	No	
024	0224_MW108_221019	HDPE (no PTFE)	20 mL	00350621045864	Grey	No	
024	0224_MW108_221019	HDPE (no PTFE)	20 mL	00350621045913	Grey	No	
025	0224_MW111_221019	HDPE (no PTFE)	20 mL	00350621046061	Grey	No	
025	0224_MW111_221019	HDPE (no PTFE)	20 mL	00350621046193	Grey	No	
026	0224_MW106_221019	HDPE (no PTFE)	20 mL	00350621045959	Grey	No	
026	0224_MW106_221019	HDPE (no PTFE)	20 mL	00350621046024	Grey	No	
027	0224_QC132_221019	HDPE (no PTFE)	20 mL	00350520004356	Grey	No	

CHAIN OF CUSTODY

(ALS) *COC#:* **43772** *ALS Laboratory:* EB Brisbane

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: WBTA (onsite & offsite - non land holder)

ORDER NO: 60612563_4.1

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: [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:

027	0224_QC132_221019	HDPE (no PTFE)	20 mL	00350520004366	Grey	No	
028	0224_QC133_221019	HDPE (no PTFE)	20 mL	00350520008581	Grey	No	
028	0224_QC133_221019	HDPE (no PTFE)	20 mL	00350520008529	Grey	No	
029	0224_SW027_221019	HDPE (no PTFE)	20 mL	00350520004475	Grey	No	
029	0224_SW027_221019	HDPE (no PTFE)	20 mL	00350520004403	Grey	No	
030	0224_MW112_221020	HDPE (no PTFE)	20 mL	00350621046172	Grey	No	
030	0224_MW112_221020	HDPE (no PTFE)	20 mL	00350621046115	Grey	No	
031	0224_MW121_221020	HDPE (no PTFE)	20 mL	00350621046033	Grey	No	
031	0224_MW121_221020	HDPE (no PTFE)	20 mL	00350621046212	Grey	No	
032	0224_MW120_221020	HDPE (no PTFE)	20 mL	00350621046146	Grey	No	
032	0224_MW120_221020	HDPE (no PTFE)	20 mL	00350621045854	Grey	No	
033	0224_OTH001_221020	HDPE (no PTFE)	20 mL	00350621045961	Grey	No	
033	0224_OTH001_221020	HDPE (no PTFE)	20 mL	00350621046205	Grey	No	
034	0224_SW016_221020	HDPE (no PTFE)	20 mL	00350520008591	Grey	No	
034	0224_SW016_221020	HDPE (no PTFE)	20 mL	00350520008622	Grey	No	
035	0224_MW119_221020	HDPE (no PTFE)	20 mL	00350621046090	Grey	No	
035	0224_MW119_221020	HDPE (no PTFE)	20 mL	00350621046158	Grey	No	
036	0224_MW122_221020	HDPE (no PTFE)	20 mL	00350621046057	Grey	No	
036	0224_MW122_221020	HDPE (no PTFE)	20 mL	00350621046056	Grey	No	
037	0224_MW113_221020	HDPE (no PTFE)	20 mL	00350621046119	Grey	No	
037	0224_MW113_221020	HDPE (no PTFE)	20 mL	00350621045829	Grey	No	
038	0224_PT001_221020	HDPE (no PTFE)	20 mL	00350621045685	Grey	No	
038	0224_PT001_221020	HDPE (no PTFE)	20 mL	00350621045951	Grey	No	
039	0224_PT005_221020	HDPE (no PTFE)	20 mL	00350621045965	Grey	No	
039	0224_PT005_221020	HDPE (no PTFE)	20 mL	00350621045985	Grey	No	
040	0224_MW117_221019	HDPE (no PTFE)	20 mL	00350621046085	Grey	No	
040	0224_MW117_221019	HDPE (no PTFE)	20 mL	00350621046177	Grey	No	

CHAIN OF CUSTODY

ALS COC#: 43772 *ALS Laboratory:* EB Brisbane

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

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: WBTA (onsite & offsite - non land holder)

ORDER NO: 60612563_4.1

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: / ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

041	0224_SW019_221020	HDPE (no PTFE)	20 mL	00350520004417	Grey	No	
041	0224_SW019_221020	HDPE (no PTFE)	20 mL	00350520004391	Grey	No	
042	0224_MW114_221020	HDPE (no PTFE)	20 mL	00350621045911	Grey	No	
042	0224_MW114_221020	HDPE (no PTFE)	20 mL	00350621045960	Grey	No	
043	0224_QC320_221019	HDPE (no PTFE)	20 mL	00350621046060	Grey	No	
043	0224_QC320_221019	HDPE (no PTFE)	20 mL	00350621046080	Grey	No	
044	0224_QC134_221020	HDPE (no PTFE)	20 mL	00350621046054	Grey	No	
044	0224_QC134_221020	HDPE (no PTFE)	20 mL	00350621046081	Grey	No	
045	0224_QC135_221020	HDPE (no PTFE)	20 mL	00350621046204	Grey	No	
045	0224_QC135_221020	HDPE (no PTFE)	20 mL	00350621046171	Grey	No	
046	0224_SW018_221021	HDPE (no PTFE)	20 mL	00350520008635	Grey	No	
046	0224_SW018_221021	HDPE (no PTFE)	20 mL	00350520008638	Grey	No	
047	0224_MW101_221022	HDPE (no PTFE)	20 mL	00350621046001	Grey	No	
047	0224_MW101_221022	HDPE (no PTFE)	20 mL	00350621046075	Grey	No	
048	0224_MW102_221021	HDPE (no PTFE)	20 mL	00350621046025	Grey	No	
048	0224_MW102_221021	HDPE (no PTFE)	20 mL	00350621046114	Grey	No	
049	0224_SW017_221021	HDPE (no PTFE)	20 mL	00350520004431	Grey	No	
049	0224_SW017_221021	HDPE (no PTFE)	20 mL	00350520004330	Grey	No	
050	0224_QC321_221020	HDPE (no PTFE)	20 mL	00350621045966	Grey	No	
050	0224_QC321_221020	HDPE (no PTFE)	20 mL	00350621045984	Grey	No	
051	0224_QC322_221021	HDPE (no PTFE)	20 mL	00350621046142	Grey	No	
051	0224_QC322_221021	HDPE (no PTFE)	20 mL	00350621046109	Grey	No	

Total Bottle Count: ALS: 102, Non ALS: 0

CHAIN OF CUSTODY

COC#: 43866 *ALS Laboratory:* EB Brisbane

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 21/10/22 16:18	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: Landholder 1

ORDER NO: 60612563_4.1

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:

SAMPLER MOBILE:

QUOTE NO: SY/139/19 V3 / ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

SAMPLE DETAILS							ANALYSIS REQUIRED		
SAMPLE	NAME	DESCRIPTION	DATE / TIME	MATRIX	TOTAL BOTTLES	ON HOLD	Optional LL PFAS for GW/SW WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0224_SW021_221019		19/10/2022 11:57 PM	Water	ALS: 2 Non ALS: 0	No	X		

Environmental Division
Brisbane
Work Order Reference
EB2231149

Telephone : +61-7-3243 7222

CHAIN OF CUSTODY

COC#: 43866 *ALS Laboratory:* EB Brisbane

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: Landholder 1

ORDER NO: 60612563_4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0224_SW021_221019	HDPE (no PTFE)	20 mL	00350520004319	Grey	No	
001	0224_SW021_221019	HDPE (no PTFE)	20 mL	00350520004347	Grey	No	

Total Bottle Count: ALS: 2, Non ALS: 0

CHAIN OF CUSTODY

ALS COC#: 43867 *ALS Laboratory:* EB Brisbane

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 21/10/22 16:10	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: Landholder 2

ORDER NO: 60612563_4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

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	Optional LL PFAS for GW/SW WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0224_SW023_221019		20/10/2022 12:00 AM	Water	ALS: 2 Non ALS: 0	No	X		
002	0224_SW022_221019		20/10/2022 12:01 AM	Water	ALS: 2 Non ALS: 0	No	X		

Environmental Division
Brisbane
Work Order Reference
EB2231150

Telephone : +61-7-3243 7222

CHAIN OF CUSTODY

ALS COC#: 43867 ALS Laboratory: EB Brisbane

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: Landholder 2

ORDER NO: 60612563_4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

SAMPLER MOBILE:

QUOTE NO: SY/139/19 V3 / ES2019AECOMAU003 0

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

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

TURNAROUND REQUIREMENTS : 5 Days

Biohazard info:

LABORATORY USE ONLY (Circle)

Custody Seal intact? Yes No N/A

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

Random Sample Temperature on Receipt: °C

Other comments:

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0224_SW023_221019	HDPE (no PTFE)	20 mL	00350520004462	Grey	No	
001	0224_SW023_221019	HDPE (no PTFE)	20 mL	00350520004424	Grey	No	
002	0224_SW022_221019	HDPE (no PTFE)	20 mL	00350520004350	Grey	No	
002	0224_SW022_221019	HDPE (no PTFE)	20 mL	00350520004494	Grey	No	

Total Bottle Count: ALS: 4, Non ALS: 0

CHAIN OF CUSTODY

ALS COC#: 43984 *ALS Laboratory:* EB Brisbane

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE TIME:	DATE TIME: 4/10/22 16:18	DATE TIME:	DATE TIME:

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: WBTA -Triplicates

ORDER NO: 60612563_4.1

PROJECT MANAGER: [redacted]

PRIMARY SAMPLER:

CONTACT PH:

QUOTE NO: SY/139/19 V3

SAMPLER MOBILE:

/ ES2019AECOMAU003 0

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	Optional LL PFAS for GW/SW WATER	PFAS Waters WATER	ALTERNATIVE ANALYSIS	ADDITIONAL INFORMATION
001	0224_QC230_221018		21/10/2022 02:02 PM	Water	ALS: 2 Non ALS: 0	No	X			Please forward to NMI Sydney
002	0224_QC231_221018		21/10/2022 02:01 PM	Water	ALS: 2 Non ALS: 0	No		X		Please forward to NMI Sydney
003	0224_QC232_221019		21/10/2022 02:03 PM	Water	ALS: 2 Non ALS: 0	No	X			Please forward to NMI Sydney
004	0224_QC233_221019		21/10/2022 02:03 PM	Water	ALS: 2 Non ALS: 0	No	X			Please forward to NMI Sydney
005	0224_QC234_221020		21/10/2022 02:05 PM	Water	ALS: 2 Non ALS: 0	No		X		Please forward to NMI Sydney
006	0224_QC235_221020		21/10/2022 02:06 PM	Water	ALS: 2 Non ALS: 0	No		X		Please forward to NMI Sydney

Environmental Division
Brisbane
Work Order Reference
EB2231151

Telephone : +61-7-3243 7222

CHAIN OF CUSTODY

ALS COC#: 43984 *ALS Laboratory:* EB Brisbane

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

CLIENT: AECOMAU - AECOM Australia Pty Ltd

PROJECT: QLD_0224_PFASOMP_20

SITE: WBTA -Triplicates

ORDER NO: 60612563_4.1

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:

/ ES2019AECOMAU0030

EMAIL REPORTS TO: [redacted]

EMAIL INVOICES TO: [redacted]

SAMPLE	SAMPLE NAME	BOTTLE NAME	VOLUME	BARCODE	TYPE	FILTERED	REASON
001	0224_QC230_221018	HDPE (no PTFE)	20 mL	00350520004382	Grey	No	
001	0224_QC230_221018	HDPE (no PTFE)	20 mL	00350520004457	Grey	No	
002	0224_QC231_221018	HDPE (no PTFE)	20 mL	00350621046083	Grey	No	
002	0224_QC231_221018	HDPE (no PTFE)	20 mL	00350621046203	Grey	No	
003	0224_QC232_221019	HDPE (no PTFE)	20 mL	00350520004422	Grey	No	
003	0224_QC232_221019	HDPE (no PTFE)	20 mL	00350520004363	Grey	No	
004	0224_QC233_221019	HDPE (no PTFE)	20 mL	00350520004332	Grey	No	
004	0224_QC233_221019	HDPE (no PTFE)	20 mL	00350520004316	Grey	No	
005	0224_QC234_221020	HDPE (no PTFE)	20 mL	00350621046019	Grey	No	
005	0224_QC234_221020	HDPE (no PTFE)	20 mL	00350621046035	Grey	No	
006	0224_QC235_221020	HDPE (no PTFE)	20 mL	00350621045949	Grey	No	
006	0224_QC235_221020	HDPE (no PTFE)	20 mL	00350621045963	Grey	No	

Total Bottle Count: ALS: 12, Non ALS: 0

✓ 2/11

AECOM

Chain of Custody

AECOM Australia Pty Ltd
[redacted]

Email reports to: [redacted]

Laboratory Details
Lab. Name: NMI
Lab. Address: [redacted]
Contact Name: [redacted]
Lab. Ref:

Tel: [redacted]
Fax:
Preliminary Report by:
Final Report by:
Lab Quote No:

Sampled By: [redacted]

Project Name: QLD_0224_PFASOMP_20

AECOM Project #: 60612563 4.1

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: _____)	

6. Report Format: ESdat

7. Project Manager: James Peachey

Analysis Request

AEC006/221026 Am

Lab. ID	Sample ID	Sampling Date	Matrix: soil	Matrix: water	Matrix: sed	Preservation: filt'ed	Preservation: acid	Preservation: ice	Preservation: other	Container (No. & type)	PFAS	Notes
N22/021041	0224_QC230_221018	18/10/2022		X						2 x P	X	
N22/021042	0224_QC231_221018	18/10/2022		X						2 x P	X	
N22/021043	0224_QC232_221019	19/10/2022		X						2 x P	X	
N22/021044	0224_QC233_221019	19/10/2022		X						2 x P	X	
N22/021045	0224_QC234_221020	20/10/2022		X						2 x P	X	
N22/021046	0224_QC235_221020	20/10/2022		X						2 x P	X	

RECEIVED
26 OCT 2022
BY: Am Ding

Comments: Please send ESdat files to [redacted] and ensure that the files use the PROJECT NAME

Temp. received: °C

Report & invoice: james.peachey@aecom.com

Lab Report No: Esky ID:

Relinquished by: [redacted] Signed: Date: 25/10/22

Received by: Signed: Date:

Relinquished by: Signed: Date:

Received by: Signed: Date:

TNT: LAB10006 6686

Appendix E

Laboratory Analytical Certificates and QA/QC Reports

Appendix E Laboratory Analytical Certificates and QA/QC Reports

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EB2225015**

Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Facsimile	: [redacted]	Facsimile	: [redacted]
Project	: QLD_0224_PFASOMP	Page	: 1 of 2
Order number	: 60612563	Quote number	: ES2020AECOMAU0024 (SY/139/19 V3_QLD)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: [redacted]		

Dates

Date Samples Received	: 25-Aug-2022 13:34	Issue Date	: 26-Aug-2022
Client Requested Due Date	: 02-Sep-2022	Scheduled Reporting Date	: **02-Sep-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 11.9°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 2 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- **Sample "0224_QC230_220825" has been forwarded to ALS Sydney, as 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.
- **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 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)
EB2225015-001	25-Aug-2022 09:00	0224_OTH001_220825	✓
EB2225015-002	25-Aug-2022 09:00	0224_QC130_220825	✓

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	AP_CustomerService.ANZ@aecom.com

DERP ESDAT REPORTS

- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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	
- A4 - AU Tax Invoice (INV)	Email	
- Chain of Custody (CoC) (COC)	Email	
- EDI Format - ESDAT (ESDAT)	Email	

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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 - ESDAT (ESDAT)	Email	

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2225015**	Page	: 1 of 5
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 25-Aug-2022 13:34
Order number	: 60612563	Date Analysis Commenced	: 26-Aug-2022
C-O-C number	: ----	Issue Date	: 05-Sep-2022 14:49
Sampler	: [redacted]		
Site	: ----		
Quote number	: SY/139/19 V3_QLD		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]	2IC Organic Chemist	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 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 PFAS: High Matrix spike recovery for NMeFOSA deemed acceptable as all associated analyte results are less than LOR
- 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	0224_OTH001_220825	0224_QC130_220825	----	----	----
				Sampling date / time	25-Aug-2022 09:00	25-Aug-2022 09:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2225015-001	EB2225015-002	--------	--------	--------
					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		**0.02**	**0.02**	----	----	----
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	0224_OTH001_220825	0224_QC130_220825	----	----	----
				Sampling date / time	25-Aug-2022 09:00	25-Aug-2022 09:00	----	----	----
Compound	CAS Number	LOR	Unit		EB2225015-001	EB2225015-002	--------	--------	--------
					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		**0.02**	**0.02**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	**0.02**	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	**0.02**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**96.1**	**89.3**	----	----	----
13C8-PFOA	----	0.02	%		**95.0**	**94.5**	----	----	----

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	: **EB2225015**	Page	: 1 of 6
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 25-Aug-2022
Order number	: 60612563	Date Analysis Commenced	: 26-Aug-2022
C-O-C number	: ----	Issue Date	: 05-Sep-2022
Sampler	: [redacted]		
Site	: ----		
Quote number	: SY/139/19 V3_QLD		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]	2IC Organic Chemist	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: 4552962)									
EB2225015-002	0224_QC130_220825	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	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: 4552962)									
EB2225015-002	0224_QC130_220825	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: 4552962)									
EB2225015-002	0224_QC130_220825	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: 4552962) - continued									
EB2225015-002	0224_QC130_220825	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: 4552962)									
EB2225015-002	0224_QC130_220825	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: 4552962)									
EB2225015-002	0224_QC130_220825	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	0.02	0.02	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	0.02	0.02	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: 4552962)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	99.4	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	104	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	103	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	115	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	109	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	112	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4552962)								
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	100	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	91.6	72.0	130
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.25 µg/L	89.8	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	99.8	71.0	129
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.25 µg/L	110	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	106	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	103	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	114	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4552962)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	87.4	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	90.5	60.5	138
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	93.6	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	105	62.6	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	115	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	98.8	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4552962)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	101	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	99.4	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	116	67.0	138

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	LCS: Spike Recovery (%)	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4552962) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	118	64.2	133
EP231P: PFAS Sums (QCLot: 4552962)								
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: 4552962)							
EB2225015-001	0224_OTH001_220825	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.2218 µg/L	101	72.0	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.235 µg/L	108	71.0	127
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.2352 µg/L	103	68.0	131
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.238 µg/L	113	69.0	134
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.232 µg/L	115	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.241 µg/L	118	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4552962)							
EB2225015-001	0224_OTH001_220825	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	1.25 µg/L	108	73.0	129
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.25 µg/L	102	72.0	129
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.25 µg/L	129	72.0	129
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.25 µg/L	89.2	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	95.6	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	116	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	114	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	120	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	109	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	109	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	113	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4552962)							
EB2225015-001	0224_OTH001_220825	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.25 µg/L	93.2	59.0	135
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.625 µg/L	# 152	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	100	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4552962) - continued							
EB2225015-001	0224_OTH001_220825	EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.625 µg/L	99.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.625 µg/L	103	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	101	65.0	136
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	98.4	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4552962)							
EB2225015-001	0224_OTH001_220825	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.234 µg/L	114	63.0	143
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.2378 µg/L	117	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.24 µg/L	120	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.2415 µg/L	115	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2225015**	Page	: 1 of 4
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP	Date Samples Received	: 25-Aug-2022
Site	: ----	Issue Date	: 05-Sep-2022
Sampler	: [redacted]	No. of samples received	: 2
Order number	: 60612563	No. of samples analysed	: 2

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

- **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							
EP231C: Perfluoroalkyl Sulfonamides	EB2225015--001	0224_OTH001_220825	**N-Methyl perfluorooctane sulfonamide (MeFOSA)**	31506-32-8	152 %	70.0-130%	**Recovery greater than upper 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)								
0224_OTH001_220825,	0224_QC130_220825	**25-Aug-2022**	**02-Sep-2022**	21-Feb-2023	✓	**05-Sep-2022**	21-Feb-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X)								
0224_OTH001_220825,	0224_QC130_220825	**25-Aug-2022**	**02-Sep-2022**	21-Feb-2023	✓	**05-Sep-2022**	21-Feb-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X)								
0224_OTH001_220825,	0224_QC130_220825	**25-Aug-2022**	**02-Sep-2022**	21-Feb-2023	✓	**05-Sep-2022**	21-Feb-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X)								
0224_OTH001_220825,	0224_QC130_220825	**25-Aug-2022**	**02-Sep-2022**	21-Feb-2023	✓	**05-Sep-2022**	21-Feb-2023	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X)								
0224_OTH001_220825,	0224_QC130_220825	**25-Aug-2022**	**02-Sep-2022**	21-Feb-2023	✓	**05-Sep-2022**	21-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	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

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2231048**

Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Facsimile	: [redacted]	Facsimile	: +[redacted]
Project	: (60612563) QLD_0224_PFASOMP	Page	: 1 of 2
Order number	: 60612563	Quote number	: ES2020AECOMAU0024 (SY/139/19 V3_QLD)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: JP		

Dates

Date Samples Received	: 31-Aug-2022 11:15	Issue Date	: 01-Sep-2022
Client Requested Due Date	: 07-Sep-2022	Scheduled Reporting Date	: **07-Sep-2022**

Delivery Details

Mode of Delivery	: Undefined	Security Seal	: Not Available
No. of coolers/boxes	: 1	Temperature	: 17.1'C
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 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)
ES2231048-001	25-Aug-2022 09:00	0224_QC230_220825	✓

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	AP_CustomerService.ANZ@aecom.com

DERP ESDAT REPORTS

- EDI Format - ESDAT (ESDAT)	Email	derp.labreports@esdat.com.au

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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 - ESDAT (ESDAT)	Email	

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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 - ESDAT (ESDAT)	Email	

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2231048**	Page	: 1 of 5
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: [redacted]	Telephone	: [redacted]
Project	: (60612563) QLD_0224_PFASOMP	Date Samples Received	: 31-Aug-2022 11:15
Order number	: 60612563	Date Analysis Commenced	: 02-Sep-2022
C-O-C number	: ----	Issue Date	: 06-Sep-2022 16:20
Sampler	: JP		
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]	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- 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 #1 confirmed by instrument QC duplicate.
- 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	0224_QC230_220825	----	----	----	----
				Sampling date / time	25-Aug-2022 09:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2231048-001	--------	--------	--------	--------
					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		**0.02**	----	----	----	----
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	0224_QC230_220825	----	----	----	----
				Sampling date / time	25-Aug-2022 09:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2231048-001	--------	--------	--------	--------
					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		**0.02**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**93.8**	----	----	----	----
13C8-PFOA	----	0.02	%		**96.1**	----	----	----	----

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	: **ES2231048**	Page	: 1 of 6
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: [redacted]
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: +[redacted]	Telephone	[redacted]
Project	: (60612563) QLD_0224_PFASOMP	Date Samples Received	: 31-Aug-2022
Order number	: 60612563	Date Analysis Commenced	: 02-Sep-2022
C-O-C number	: ----	Issue Date	: 06-Sep-2022
Sampler	: [redacted]		
Site	: ----		
Quote number	: SY/139/19 V3_QLD		
No. of samples received	: 1		
No. of samples analysed	: 1		

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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: 4558749)									
ES2231048-001	0224_QC230_220825	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	0.02	0.02	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: 4558749)									
ES2231048-001	0224_QC230_220825	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: 4558749)									
ES2231048-001	0224_QC230_220825	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: 4558749) - continued									
ES2231048-001	0224_QC230_220825	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: 4558749)									
ES2231048-001	0224_QC230_220825	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: 4558749)									
ES2231048-001	0224_QC230_220825	EP231X: Sum of PFAS	----	0.01	µg/L	0.02	0.02	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: 4558749)								
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	116	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	115	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.25 µg/L	111	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
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4558749)								
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	112	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	112	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	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	110	69.0	133
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.25 µg/L	109	72.0	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.25 µg/L	104	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: 4558749)								
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	126	62.6	147
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	116	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	121	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
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4558749)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.25 µg/L	117	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	118	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: 4558749) - continued								
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

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: 4558749)							
ES2231048-001	0224_QC230_220825	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.25 µg/L	92.8	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	108	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	104	65.0	140
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.25 µg/L	101	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4558749)							
ES2231048-001	0224_QC230_220825	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	103	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	104	72.0	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.25 µg/L	107	71.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.25 µg/L	106	69.0	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.25 µg/L	104	71.0	129
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.25 µg/L	106	69.0	133
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.25 µg/L	103	72.0	134
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.25 µg/L	103	65.0	144
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.625 µg/L	116	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4558749)							
ES2231048-001	0224_QC230_220825	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	114	68.0	141
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.625 µg/L	115	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	114	57.6	145
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.25 µg/L	115	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: 4558749) - continued							
ES2231048-001	0224_QC230_220825	EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.25 µg/L	115	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4558749)							
ES2231048-001	0224_QC230_220825	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	119	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.25 µg/L	110	67.0	138
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.25 µg/L	105	71.4	144

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2231048**	Page	: 1 of 4
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Telephone	[redacted]
Project	: (60612563) QLD_0224_PFASOMP	Date Samples Received	: 31-Aug-2022
Site	: ----	Issue Date	: 06-Sep-2022
Sampler	: [redacted]	No. of samples received	: 1
Order number	: 60612563	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.**
- **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	12	8.33	10.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0224_QC230_220825	**25-Aug-2022**	**06-Sep-2022**	21-Feb-2023	✓	**06-Sep-2022**	21-Feb-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X) 0224_QC230_220825	**25-Aug-2022**	**06-Sep-2022**	21-Feb-2023	✓	**06-Sep-2022**	21-Feb-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X) 0224_QC230_220825	**25-Aug-2022**	**06-Sep-2022**	21-Feb-2023	✓	**06-Sep-2022**	21-Feb-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X) 0224_QC230_220825	**25-Aug-2022**	**06-Sep-2022**	21-Feb-2023	✓	**06-Sep-2022**	21-Feb-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X) 0224_QC230_220825	**25-Aug-2022**	**06-Sep-2022**	21-Feb-2023	✓	**06-Sep-2022**	21-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	1	12	**8.33**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	**8.33**	**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

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order	: **EB2231148**		
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: QLD_0224_PFASOMP_20	Page	: 1 of 5
Order number	: 60612563_4.1	Quote number	: ES2019AECOMAU0030 (SY/139/19 V3)
C-O-C number	: 43772	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: WBTA (onsite & offsite - non land holder)		
Sampler	: [redacted]		

Dates

Date Samples Received	: 21-Oct-2022 17:10	Issue Date	: 13-Jan-2023
Client Requested Due Date	: 03-Nov-2022	Scheduled Reporting Date	: **03-Nov-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 9.1°C, 7.4°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 52 / 51

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 be advised; an additional two containers were received and have been added to the end of this workorder labelled "SW007". If you wish to discuss this, please contact client services at ALSEnviro.Brisbane@alsglobal.com.**
- **For your reference: an extra sample has been received at the laboratory. This has been added to the end of the work order and place on Hold. If this sample requires analysis, please contact your Client Services Representative.**
- **13/01/2023: SRN has been resent to acknowledge the amendment of Sample ID for ALS Sample #39 as per the email from [redacted].**
- **25/10/2022: SRN has been resent to acknowledge request to change ID for sample EB2231148-038. For samples where both EP231X and EP231X-LL have been requested only EP231X-LL will be analysed. For any further information regarding these adjustments please contact client services at ALSEnviro.Brisbane@alsglobal.com.**
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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 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-LL PFAS - Full Suite Low Level (28 analytes)
EB2231148-001	17-Oct-2022 20:53	0224_MW115_221017		✓	
EB2231148-002	17-Oct-2022 20:55	0224_SW008_221017			✓
EB2231148-003	17-Oct-2022 20:56	0224_SW012_221017			✓
EB2231148-004	18-Oct-2022 11:03	0224_MW109_221018		✓	
EB2231148-005	18-Oct-2022 18:43	0224_SW004_221018			✓
EB2231148-006	18-Oct-2022 19:46	0224_MW104_221018		✓	
EB2231148-007	18-Oct-2022 19:47	0224_SW014_221018		✓	
EB2231148-008	18-Oct-2022 19:48	0224_MW110_221018		✓	
EB2231148-009	18-Oct-2022 19:50	0224_SW005_221018			✓
EB2231148-010	18-Oct-2022 19:51	0224_SW013_221018			✓
EB2231148-011	18-Oct-2022 19:53	0224_MW103_221018		✓	
EB2231148-012	18-Oct-2022 19:59	0224_QC130_221018			✓
EB2231148-013	18-Oct-2022 20:03	0224_MW118_221018		✓	
EB2231148-014	18-Oct-2022 20:04	0224_QC131_221018		✓	
EB2231148-015	18-Oct-2022 20:07	0224_QC318_221017		✓	
EB2231148-016	18-Oct-2022 20:09	0224_QC319_221018		✓	
EB2231148-017	18-Oct-2022 20:11	0224_SW007_221018			✓
EB2231148-018	20-Oct-2022 00:07	0224_MW105_221019		✓	
EB2231148-019	20-Oct-2022 00:08	0224_SW009_221019			✓
EB2231148-020	20-Oct-2022 00:10	0224_SW025_221019			✓
EB2231148-021	20-Oct-2022 00:11	0224_MW107_221019		✓	
EB2231148-022	20-Oct-2022 00:13	0224_MW116_221019		✓	
EB2231148-023	20-Oct-2022 00:15	0224_SW006_221019			✓
EB2231148-024	20-Oct-2022 00:19	0224_MW108_221019		✓	
EB2231148-025	20-Oct-2022 00:20	0224_MW111_221019		✓	
EB2231148-026	20-Oct-2022 00:22	0224_MW106_221019		✓	
EB2231148-027	20-Oct-2022 00:51	0224_QC132_221019			✓
EB2231148-028	20-Oct-2022 00:53	0224_QC133_221019			✓
EB2231148-029	20-Oct-2022 01:02	0224_SW027_221019			✓
EB2231148-030	20-Oct-2022 21:21	0224_MW112_221020		✓	
EB2231148-031	20-Oct-2022 21:22	0224_MW121_221020		✓	
EB2231148-032	20-Oct-2022 21:24	0224_MW120_221020		✓	
EB2231148-033	20-Oct-2022 21:25	0224_OTH001_221020		✓	
EB2231148-034	20-Oct-2022 21:26	0224_SW016_221020			✓
EB2231148-035	20-Oct-2022 21:28	0224_MW119_221020		✓	

			(On Hold) WATER No analysis requested	WATER - EP231X PFAS - Full Suite (28 analytes)	WATER - EP231X-LL PFAS - Full Suite Low Level (28 analytes)
EB2231148-036	20-Oct-2022 21:29	0224_MW122_221020		✓	
EB2231148-037	20-Oct-2022 21:30	0224_MW113_221020		✓	
EB2231148-038	20-Oct-2022 21:31	0224_POT001_221020		✓	
EB2231148-039	20-Oct-2022 21:32	0224_POT005_221020		✓	
EB2231148-040	20-Oct-2022 21:34	0224_MW117_221019		✓	
EB2231148-041	20-Oct-2022 21:35	0224_SW019_221020			✓
EB2231148-042	20-Oct-2022 21:36	0224_MW114_221020		✓	
EB2231148-043	21-Oct-2022 00:13	0224_QC320_221019		✓	
EB2231148-044	21-Oct-2022 00:16	0224_QC134_221020		✓	
EB2231148-045	21-Oct-2022 00:20	0224_QC135_221020		✓	
EB2231148-046	21-Oct-2022 14:52	0224_SW018_221021			✓
EB2231148-047	21-Oct-2022 14:53	0224_MW101_221022		✓	
EB2231148-048	21-Oct-2022 14:54	0224_MW102_221021		✓	
EB2231148-049	21-Oct-2022 14:55	0224_SW017_221021			✓
EB2231148-050	21-Oct-2022 15:33	0224_QC321_221020		✓	
EB2231148-051	21-Oct-2022 15:34	0224_QC322_221021		✓	
EB2231148-052	[18-Oct-2022]	SW007	✓		

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	AP_CustomerService.ANZ@aecom.com

[redacted]

- *AU Certificate of Analysis - NATA (COA)	Email	[redacted]
- *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 - 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 - 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	
- A4 - AU Tax Invoice (INV)	Email	
- Chain of Custody (CoC) (COC)	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	
- A4 - AU Tax Invoice (INV)	Email	
- Chain of Custody (CoC) (COC)	Email	
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)	Email	
- EDI Format - ESDAT (ESDAT)	Email	
- EDI Format - XTab (XTAB)	Email	

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2231148**	Page	: 1 of 27
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP_20	Date Samples Received	: 21-Oct-2022 17:10
Order number	: 60612563_4.1	Date Analysis Commenced	: 24-Oct-2022
C-O-C number	: 43772	Issue Date	: 13-Jan-2023 10:01
Sampler	: [redacted]		
Site	: WBTA (onsite & offsite - non land holder)		
Quote number	: SY/139/19 V3		
No. of samples received	: 52		
No. of samples analysed	: 51		

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 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-LL PFAS Low Level: The LOR for PFBS has been raised for particular samples due to matrix interference.
- 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 (13/01/2023): This report has been amended as a result of a request to change sample identification numbers (IDs) received from James Peachey on 13/01/2023, for samples 0224_POT005_221020 (ALS #39). All analysis results are as per the previous report.
- EP231X-LL PFAS Low Level: Particular samples required dilution prior to extraction due to matrix interferences. LOR values have been adjusted accordingly.
- EP231X-(PFAS): High LCS recovery deemed acceptable as all associated analyte results are less than limit of reporting.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0224_MW115_221017	0224_MW109_221018	0224_MW104_221018	0224_MW110_221018	0224_MW103_221018
				Sampling date / time	17-Oct-2022 20:53	18-Oct-2022 11:03	18-Oct-2022 19:46	18-Oct-2022 19:48	18-Oct-2022 19:53
Compound	CAS Number	LOR	Unit		EB2231148-001	EB2231148-004	EB2231148-006	EB2231148-008	EB2231148-011
					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	0.01	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: GROUNDWATER (Matrix: WATER)				Sample ID	0224_MW115_221017	0224_MW109_221018	0224_MW104_221018	0224_MW110_221018	0224_MW103_221018
				Sampling date / time	17-Oct-2022 20:53	18-Oct-2022 11:03	18-Oct-2022 19:46	18-Oct-2022 19:48	18-Oct-2022 19:53
Compound	CAS Number	LOR	Unit		EB2231148-001	EB2231148-004	EB2231148-006	EB2231148-008	EB2231148-011
					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	<0.01	<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	%		**97.5**	**98.9**	**101**	**104**	**108**
13C8-PFOA	----	0.02	%		**97.1**	**95.8**	**90.4**	**98.0**	**100**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	0224_MW118_221018	0224_QC131_221018	0224_MW105_221019	0224_MW107_221019	0224_MW116_221019
				Sampling date / time	18-Oct-2022 20:03	18-Oct-2022 20:04	20-Oct-2022 00:07	20-Oct-2022 00:11	20-Oct-2022 00:13
					EB2231148-013	EB2231148-014	EB2231148-018	EB2231148-021	EB2231148-022
					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**	**0.02**	<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		**0.01**	**0.02**	<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)				Sample ID	0224_MW118_221018	0224_QC131_221018	0224_MW105_221019	0224_MW107_221019	0224_MW116_221019
				Sampling date / time	18-Oct-2022 20:03	18-Oct-2022 20:04	20-Oct-2022 00:07	20-Oct-2022 00:11	20-Oct-2022 00:13
Compound	CAS Number	LOR	Unit		EB2231148-013	EB2231148-014	EB2231148-018	EB2231148-021	EB2231148-022
					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**	**0.04**	<0.01	<0.01	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.02**	**0.04**	<0.01	<0.01	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.02**	**0.04**	<0.01	<0.01	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**98.1**	**102**	**108**	**95.0**	**102**
13C8-PFOA	----	0.02	%		**93.8**	**99.9**	**96.3**	**97.9**	**101**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0224_MW108_221019	0224_MW111_221019	0224_MW106_221019	0224_MW112_221020	0224_MW121_221020
				Sampling date / time	20-Oct-2022 00:19	20-Oct-2022 00:20	20-Oct-2022 00:22	20-Oct-2022 21:21	20-Oct-2022 21:22
Compound	CAS Number	LOR	Unit		EB2231148-024	EB2231148-025	EB2231148-026	EB2231148-030	EB2231148-031
					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	<0.01	<0.01	**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		<0.01	<0.01	<0.01	<0.01	**0.03**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
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**)

Compound	CAS Number	LOR	Unit	Sample ID	0224_MW108_221019	0224_MW111_221019	0224_MW106_221019	0224_MW112_221020	0224_MW121_221020
				Sampling date / time	20-Oct-2022 00:19	20-Oct-2022 00:20	20-Oct-2022 00:22	20-Oct-2022 21:21	20-Oct-2022 21:22
					EB2231148-024	EB2231148-025	EB2231148-026	EB2231148-030	EB2231148-031
					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	<0.01	<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	%		**93.6**	**102**	**104**	**106**	**104**
13C8-PFOA	----	0.02	%		**98.2**	**102**	**98.2**	**104**	**101**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	0224_MW120_221020	0224_OTH001_221020	0224_MW119_221020	0224_MW122_221020	0224_MW113_221020
				Sampling date / time	20-Oct-2022 21:24	20-Oct-2022 21:25	20-Oct-2022 21:28	20-Oct-2022 21:29	20-Oct-2022 21:30
					EB2231148-032	EB2231148-033	EB2231148-035	EB2231148-036	EB2231148-037
					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	<0.02	<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	**0.02**	<0.01	**0.13**	<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	**0.06**	<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	<0.02	<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**)

Compound	CAS Number	LOR	Unit	Sample ID	0224_MW120_221020	0224_OTH001_221020	0224_MW119_221020	0224_MW122_221020	0224_MW113_221020
				Sampling date / time	20-Oct-2022 21:24	20-Oct-2022 21:25	20-Oct-2022 21:28	20-Oct-2022 21:29	20-Oct-2022 21:30
					EB2231148-032	EB2231148-033	EB2231148-035	EB2231148-036	EB2231148-037
					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	**0.02**	<0.01	**0.19**	<0.01
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		<0.01	**0.02**	<0.01	**0.19**	<0.01
Sum of PFAS (WA DER List)	----	0.01	µg/L		<0.01	**0.02**	<0.01	**0.19**	<0.01
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	**114**	**108**	**124**	**96.5**
13C8-PFOA	----	0.02	%		**103**	**98.6**	**102**	**101**	**105**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	0224_POT001_221020	0224_POT005_221020	0224_MW117_221019	0224_MW114_221020	0224_QC134_221020
				Sampling date / time	20-Oct-2022 21:31	20-Oct-2022 21:32	20-Oct-2022 21:34	20-Oct-2022 21:36	21-Oct-2022 00:16
					EB2231148-038	EB2231148-039	EB2231148-040	EB2231148-042	EB2231148-044
					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**	<0.01	<0.01	<0.01	**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		<0.01	<0.01	<0.01	<0.01	**0.03**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
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	0224_POT001_221020	0224_POT005_221020	0224_MW117_221019	0224_MW114_221020	0224_QC134_221020
				Sampling date / time	20-Oct-2022 21:31	20-Oct-2022 21:32	20-Oct-2022 21:34	20-Oct-2022 21:36	21-Oct-2022 00:16
Compound	CAS Number	LOR	Unit		EB2231148-038	EB2231148-039	EB2231148-040	EB2231148-042	EB2231148-044
					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		**0.03**	<0.01	<0.01	<0.01	**0.09**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.03**	<0.01	<0.01	<0.01	**0.09**
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.03**	<0.01	<0.01	<0.01	**0.09**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**117**	**103**	**96.8**	**109**	**102**
13C8-PFOA	----	0.02	%		**105**	**102**	**100**	**104**	**102**

Analytical Results

Sub-Matrix: GROUNDWATER (Matrix: WATER)				Sample ID	0224_QC135_221020	0224_MW101_221022	0224_MW102_221021	----	----
				Sampling date / time	21-Oct-2022 00:20	21-Oct-2022 14:53	21-Oct-2022 14:54	----	----
Compound	CAS Number	LOR	Unit		EB2231148-045	EB2231148-047	EB2231148-048	--------	--------
					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		**0.12**	<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		**0.05**	<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: GROUNDWATER (Matrix: WATER)				Sample ID	0224_QC135_221020	0224_MW101_221022	0224_MW102_221021	----	----
				Sampling date / time	21-Oct-2022 00:20	21-Oct-2022 14:53	21-Oct-2022 14:54	----	----
Compound	CAS Number	LOR	Unit		EB2231148-045	EB2231148-047	EB2231148-048	--------	--------
					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		**0.19**	<0.01	<0.01	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**0.17**	<0.01	<0.01	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**0.19**	<0.01	<0.01	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**100**	**111**	**112**	----	----
13C8-PFOA	----	0.02	%		**96.2**	**95.0**	**100**	----	----

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0224_QC318_221017	0224_QC319_221018	0224_QC320_221019	0224_QC321_221020	0224_QC322_221021
				Sampling date / time	18-Oct-2022 20:07	18-Oct-2022 20:09	21-Oct-2022 00:13	21-Oct-2022 15:33	21-Oct-2022 15:34
Compound	CAS Number	LOR	Unit		EB2231148-015	EB2231148-016	EB2231148-043	EB2231148-050	EB2231148-051
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		<0.1	<0.1	<0.1	<0.1	<0.1
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.02	<0.02	<0.02	<0.02	<0.02
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.05	<0.05	<0.05	<0.05	<0.05

Analytical Results

Sub-Matrix: RINSATE (Matrix: WATER)				Sample ID	0224_QC318_221017	0224_QC319_221018	0224_QC320_221019	0224_QC321_221020	0224_QC322_221021
				Sampling date / time	18-Oct-2022 20:07	18-Oct-2022 20:09	21-Oct-2022 00:13	21-Oct-2022 15:33	21-Oct-2022 15:34
Compound	CAS Number	LOR	Unit		EB2231148-015	EB2231148-016	EB2231148-043	EB2231148-050	EB2231148-051
					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	%		**109**	**97.3**	**102**	**102**	**98.0**
13C8-PFOA	----	0.02	%		**98.0**	**102**	**108**	**104**	**104**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	0224_SW008_221017	0224_SW012_221017	0224_SW004_221018	0224_SW014_221018	0224_SW005_221018
				Sampling date / time	17-Oct-2022 20:55	17-Oct-2022 20:56	18-Oct-2022 18:43	18-Oct-2022 19:47	18-Oct-2022 19:50
					EB2231148-002	EB2231148-003	EB2231148-005	EB2231148-007	EB2231148-009
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		<0.006	<0.008	<0.010	----	<0.006
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		----	----	----	<0.02	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		----	----	----	<0.02	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		----	----	----	<0.01	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		----	----	----	<0.02	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
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	0.01	µg/L		<0.01	<0.01	<0.01	----	<0.01
Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L		----	----	----	<0.1	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		----	----	----	<0.02	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		----	----	----	<0.02	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		----	----	----	<0.02	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		----	----	----	<0.01	----
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0224_SW008_221017	0224_SW012_221017	0224_SW004_221018	0224_SW014_221018	0224_SW005_221018
				Sampling date / time	17-Oct-2022 20:55	17-Oct-2022 20:56	18-Oct-2022 18:43	18-Oct-2022 19:47	18-Oct-2022 19:50
Compound	CAS Number	LOR	Unit		EB2231148-002	EB2231148-003	EB2231148-005	EB2231148-007	EB2231148-009
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		----	----	----	<0.02	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		----	----	----	<0.02	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		----	----	----	<0.02	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		----	----	----	<0.02	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		----	----	----	<0.02	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		----	----	----	<0.05	----
Perfluorohexadecanoic acid (PFHxDA)	67905-19-5	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		----	----	----	<0.02	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		----	----	----	<0.05	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		----	----	----	<0.05	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0224_SW008_221017	0224_SW012_221017	0224_SW004_221018	0224_SW014_221018	0224_SW005_221018
				Sampling date / time	17-Oct-2022 20:55	17-Oct-2022 20:56	18-Oct-2022 18:43	18-Oct-2022 19:47	18-Oct-2022 19:50
Compound	CAS Number	LOR	Unit		EB2231148-002	EB2231148-003	EB2231148-005	EB2231148-007	EB2231148-009
					Result	Result	Result	Result	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	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		----	----	----	<0.05	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		----	----	----	<0.02	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
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	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
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	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
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	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
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	0.005	µg/L		<0.005	<0.005	<0.005	----	<0.005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		----	----	----	<0.05	----
EP231P: PFAS Sums									

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0224_SW008_221017	0224_SW012_221017	0224_SW004_221018	0224_SW014_221018	0224_SW005_221018
				Sampling date / time	17-Oct-2022 20:55	17-Oct-2022 20:56	18-Oct-2022 18:43	18-Oct-2022 19:47	18-Oct-2022 19:50
Compound	CAS Number	LOR	Unit		EB2231148-002	EB2231148-003	EB2231148-005	EB2231148-007	EB2231148-009
					Result	Result	Result	Result	Result
EP231P: PFAS Sums - Continued									
Sum of PFAS	----	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Sum of PFAS	----	0.01	µg/L		----	----	----	<0.01	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		----	----	----	<0.01	----
Sum of PFAS (WA DER List)	----	0.002	µg/L		<0.002	<0.002	<0.002	----	<0.002
Sum of PFAS (WA DER List)	----	0.01	µg/L		----	----	----	<0.01	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**80.5**	**97.0**	**99.1**	----	**90.5**
13C4-PFOS	----	0.02	%		----	----	----	**94.2**	----
13C8-PFOA	----	0.002	%		**94.2**	**103**	**97.8**	----	**99.6**
13C8-PFOA	----	0.02	%		----	----	----	**95.8**	----

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	0224_SW013_221018	0224_QC130_221018	0224_SW007_221018	0224_SW009_221019	0224_SW025_221019
				Sampling date / time	18-Oct-2022 19:51	18-Oct-2022 19:59	18-Oct-2022 20:11	20-Oct-2022 00:08	20-Oct-2022 00:10
					EB2231148-010	EB2231148-012	EB2231148-017	EB2231148-019	EB2231148-020
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		<0.008	<0.008	<0.006	<0.028	<0.008
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		**0.005**	**0.003**	<0.002	<0.002	<0.002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		**0.004**	<0.002	<0.002	<0.002	**0.003**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
Perfluorohexadecanoic acid (PFHxDA)	67905-19-5	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0224_SW013_221018	0224_QC130_221018	0224_SW007_221018	0224_SW009_221019	0224_SW025_221019
				Sampling date / time	18-Oct-2022 19:51	18-Oct-2022 19:59	18-Oct-2022 20:11	20-Oct-2022 00:08	20-Oct-2022 00:10
Compound	CAS Number	LOR	Unit		EB2231148-010	EB2231148-012	EB2231148-017	EB2231148-019	EB2231148-020
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.002	<0.002	<0.002	<0.002	<0.002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP231P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		**0.009**	**0.003**	<0.002	<0.002	**0.003**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		**0.009**	**0.003**	<0.002	<0.002	**0.003**
Sum of PFAS (WA DER List)	----	0.002	µg/L		**0.009**	**0.003**	<0.002	<0.002	**0.003**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**96.0**	**88.4**	**84.1**	**88.4**	**85.8**
13C8-PFOA	----	0.002	%		**93.6**	**97.3**	**85.1**	**105**	**99.5**

Analytical Results

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

Compound	CAS Number	LOR	Unit	Sample ID	0224_SW006_221019	0224_QC132_221019	0224_QC133_221019	0224_SW027_221019	0224_SW016_221020
				Sampling date / time	20-Oct-2022 00:15	20-Oct-2022 00:51	20-Oct-2022 00:53	20-Oct-2022 01:02	20-Oct-2022 21:26
					EB2231148-023	EB2231148-027	EB2231148-028	EB2231148-029	EB2231148-034
					Result	Result	Result	Result	Result
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		<0.008	<0.028	<0.010	<0.024	<0.006
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		<0.002	<0.005	<0.010	**0.006**	<0.002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		<0.002	<0.005	<0.010	**0.004**	<0.002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		<0.01	<0.02	<0.05	<0.01	<0.01
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.005	<0.012	<0.024	<0.005	<0.005
Perfluorohexadecanoic acid (PFHxDA)	67905-19-5	0.005	µg/L		<0.005	<0.012	<0.024	<0.005	<0.005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.005	<0.012	<0.024	<0.005	<0.005

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0224_SW006_221019	0224_QC132_221019	0224_QC133_221019	0224_SW027_221019	0224_SW016_221020
				Sampling date / time	20-Oct-2022 00:15	20-Oct-2022 00:51	20-Oct-2022 00:53	20-Oct-2022 01:02	20-Oct-2022 21:26
Compound	CAS Number	LOR	Unit		EB2231148-023	EB2231148-027	EB2231148-028	EB2231148-029	EB2231148-034
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.005	<0.012	<0.024	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.005	<0.012	<0.024	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.005	<0.012	<0.024	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.002	<0.005	<0.010	<0.002	<0.002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.005	<0.005	<0.010	<0.005	<0.005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.005	<0.005	<0.010	<0.005	<0.005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.005	<0.005	<0.010	<0.005	<0.005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.005	<0.005	<0.010	<0.005	<0.005
EP231P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		<0.002	<0.005	<0.010	**0.010**	<0.002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		<0.002	<0.005	<0.010	**0.010**	<0.002
Sum of PFAS (WA DER List)	----	0.002	µg/L		<0.002	<0.005	<0.010	**0.010**	<0.002
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**93.0**	**79.6**	**102**	**82.5**	**84.1**
13C8-PFOA	----	0.002	%		**105**	**92.2**	**104**	**96.3**	**94.7**

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0224_SW019_221020	0224_SW018_221021	0224_SW017_221021	----	----
				Sampling date / time	20-Oct-2022 21:35	21-Oct-2022 14:52	21-Oct-2022 14:55	----	----
Compound	CAS Number	LOR	Unit		EB2231148-041	EB2231148-046	EB2231148-049	--------	--------
					Result	Result	Result	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		<0.014	<0.002	<0.002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		<0.009	<0.002	<0.002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		**0.015**	<0.002	<0.002	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		<0.009	<0.002	<0.002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		**0.012**	<0.002	<0.002	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.009	<0.002	<0.002	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		<0.04	<0.01	<0.01	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		<0.009	<0.002	<0.002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		<0.009	<0.002	<0.002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		<0.009	<0.002	<0.002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		<0.009	<0.002	<0.002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.009	<0.002	<0.002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.009	<0.002	<0.002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.009	<0.002	<0.002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.009	<0.002	<0.002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.009	<0.002	<0.002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.022	<0.005	<0.005	----	----
Perfluorohexadecanoic acid (PFHxDA)	67905-19-5	0.005	µg/L		<0.022	<0.005	<0.005	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.009	<0.002	<0.002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.022	<0.005	<0.005	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0224_SW019_221020	0224_SW018_221021	0224_SW017_221021	----	----
				Sampling date / time	20-Oct-2022 21:35	21-Oct-2022 14:52	21-Oct-2022 14:55	----	----
Compound	CAS Number	LOR	Unit		EB2231148-041	EB2231148-046	EB2231148-049	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.022	<0.005	<0.005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.022	<0.005	<0.005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.022	<0.005	<0.005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.009	<0.002	<0.002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.009	<0.002	<0.002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.009	<0.005	<0.005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.009	<0.005	<0.005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.009	<0.005	<0.005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.009	<0.005	<0.005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		**0.027**	<0.002	<0.002	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		**0.027**	<0.002	<0.002	----	----
Sum of PFAS (WA DER List)	----	0.002	µg/L		**0.027**	<0.002	<0.002	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**97.1**	**88.2**	**85.9**	----	----
13C8-PFOA	----	0.002	%		**97.5**	**93.0**	**102**	----	----

Surrogate Control Limits

Sub-Matrix: **GROUNDWATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **RINSATE**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

Sub-Matrix: **SURFACE 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	: **EB2231148**	Page	: 1 of 11
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]tralia 4053
Telephone	: ----	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP_20	Date Samples Received	: 21-Oct-2022
Order number	: 60612563_4.1	Date Analysis Commenced	: 24-Oct-2022
C-O-C number	: 43772	Issue Date	: 13-Jan-2023
Sampler	: [redacted]		
Site	: WBTA (onsite & offsite - non land holder)		
Quote number	: SY/139/19 V3		
No. of samples received	: 52		
No. of samples analysed	: 51		

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]	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: 4659515)									
EB2231148-007	0224_SW014_221018	EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4677981)									
EB2231148-002	0224_SW008_221017	EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.006	<0.006	0.0	No Limit
		EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	<0.002	0.0	No Limit
EB2231148-027	0224_QC132_221019	EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.028	<0.032	13.3	No Limit
		EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.005	<0.005	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 4677981) - continued									
EB2231148-027	0224_QC132_221019	EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.005	<0.005	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4659515)									
EB2231148-007	0224_SW014_221018	EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	<0.1	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 4677981)									
EB2231148-002	0224_SW008_221017	EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Perfluorohexadecanoic acid (PFHxDA)	67905-19-5	0.005	µg/L	<0.005	0.050	163	No Limit
		EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EB2231148-027	0224_QC132_221019	EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.005	<0.005	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: 4677981) - continued									
EB2231148-027	0224_QC132_221019	EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.012	<0.012	0.0	No Limit
		EP231X-LL: Perfluorohexadecanoic acid (PFHxDA)	67905-19-5	0.005	µg/L	<0.012	<0.012	0.0	No Limit
		EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.02	<0.02	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 4659515)									
EB2231148-007	0224_SW014_221018	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: 4677981)									
EB2231148-002	0224_SW008_221017	EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	<0.005	0.0	No Limit
EB2231148-027	0224_QC132_221019	EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.005	<0.005	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: 4677981) - continued									
EB2231148-027	0224_QC132_221019	EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.012	<0.012	0.0	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.012	<0.012	0.0	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.012	<0.012	0.0	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.012	<0.012	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 4659515)									
EB2231148-007	0224_SW014_221018	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: 4677981)									
EB2231148-002	0224_SW008_221017	EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	<0.005	0.0	No Limit
EB2231148-027	0224_QC132_221019	EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	<0.005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4659515)									
EB2231148-007	0224_SW014_221018	EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.01	<0.01	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	<0.01	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 4677981)									
EB2231148-002	0224_SW008_221017	EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	<0.002	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231P: PFAS Sums (QC Lot: 4677981) - continued									
EB2231148-002	0224_SW008_221017	EP231X-LL: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L	<0.002	<0.002	0.0	No Limit
		EP231X-LL: Sum of PFAS (WA DER List)	----	0.002	µg/L	<0.002	<0.002	0.0	No Limit
EB2231148-027	0224_QC132_221019	EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L	<0.005	<0.005	0.0	No Limit
		EP231X-LL: Sum of PFAS (WA DER List)	----	0.002	µg/L	<0.005	<0.005	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: 4659515)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.2218 µg/L	107	72.0	130
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.2352 µg/L	126	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	123	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	120	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	113	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	112	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4676679)								
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	106	71.0	127
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.2373 µg/L	119	68.0	131
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.238 µg/L	122	69.0	134
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.232 µg/L	131	65.0	140
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.241 µg/L	122	53.0	142
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 4677981)								
EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	0.0222 µg/L	114	72.0	130
EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	0.0235 µg/L	113	71.0	127
EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	0.0237 µg/L	116	68.0	131
EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	0.0238 µg/L	113	69.0	134
EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	0.0232 µg/L	118	65.0	140
EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	0.0241 µg/L	115	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4659515)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	119	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	128	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	112	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	108	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	111	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	126	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	108	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4676679)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.1	1.25 µg/L	121	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: 4676679) - continued								
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	129	72.0	129
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.25 µg/L	114	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	105	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	118	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	118	65.0	144
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	0.625 µg/L	126	71.0	132
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4677981)								
EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	0.125 µg/L	116	73.0	129
EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	0.025 µg/L	100	72.0	129
EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	0.025 µg/L	126	72.0	129
EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	0.025 µg/L	113	72.0	130
EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	0.025 µg/L	120	71.0	133
EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	0.025 µg/L	113	69.0	130
EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	0.025 µg/L	98.8	71.0	129
EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	0.025 µg/L	116	69.0	133
EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	0.025 µg/L	109	72.0	134
EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	0.025 µg/L	102	65.0	144
EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	0.0625 µg/L	101	71.0	132
EP231X-LL: Perfluorohexadecanoic acid (PFHxDA)	67905-19-5	0.005	µg/L	<0.005	0.025 µg/L	108	38.8	149
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4659515)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	81.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	103	68.0	141
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	0.625 µg/L	111	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	122	62.6	138
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	96.6	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4676679)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.25 µg/L	# 141	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	0.625 µg/L	# 147	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

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: 4676679) - continued								
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	0.625 µg/L	123	68.3	134
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	0.625 µg/L	116	62.6	138
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.25 µg/L	130	65.0	136
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.25 µg/L	122	61.0	135
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4677981)								
EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	0.025 µg/L	128	67.0	137
EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	0.0625 µg/L	109	68.0	141
EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	0.0625 µg/L	130	57.9	141
EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	0.0625 µg/L	128	63.3	134
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	0.0625 µg/L	104	60.0	136
EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	0.025 µg/L	128	65.0	136
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	0.025 µg/L	98.0	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4659515)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	112	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	101	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	111	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	104	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4676679)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.2343 µg/L	134	63.0	143
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.2378 µg/L	120	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	109	67.0	138
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.241 µg/L	120	64.2	133
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4677981)								
EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	0.0234 µg/L	112	63.0	143
EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	0.0238 µg/L	110	64.0	140
EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	0.024 µg/L	117	67.0	138
EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	0.0242 µg/L	132	53.1	133
EP231P: PFAS Sums (QCLot: 4659515)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231P: PFAS Sums (QCLot: 4659515) - continued								
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 4676679)								
EP231X: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----
EP231P: PFAS Sums (QCLot: 4677981)								
EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFAS (WA DER List)	----	0.002	µg/L	<0.002	----	----	----	----

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: 4677981)							
EB2231148-003	0224_SW012_221017	EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0222 µg/L	110	72.0	130
		EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0235 µg/L	112	71.0	127
		EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0237 µg/L	119	68.0	131
		EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0238 µg/L	113	69.0	134
		EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0232 µg/L	98.3	65.0	140
		EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0241 µg/L	96.8	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4677981)							
EB2231148-003	0224_SW012_221017	EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.125 µg/L	105	73.0	129
		EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.025 µg/L	92.8	72.0	129
		EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.025 µg/L	126	72.0	129
		EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.025 µg/L	125	72.0	130
		EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.025 µg/L	112	71.0	133
		EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.025 µg/L	98.9	69.0	130
		EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.025 µg/L	105	71.0	129
		EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.025 µg/L	114	69.0	133
		EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.025 µg/L	104	72.0	134

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: 4677981) - continued							
EB2231148-003	0224_SW012_221017	EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.025 µg/L	110	65.0	144
		EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0625 µg/L	103	71.0	132
		EP231X-LL: Perfluorohexadecanoic acid (PFHxDA)	67905-19-5	0.025 µg/L	106	50.0	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4677981)							
EB2231148-003	0224_SW012_221017	EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.025 µg/L	130	67.0	137
		EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0625 µg/L	116	68.0	141
		EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0625 µg/L	114	40.0	130
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0625 µg/L	113	50.0	130
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0625 µg/L	92.2	40.0	130
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.025 µg/L	110	65.0	136
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.025 µg/L	97.7	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4677981)							
EB2231148-003	0224_SW012_221017	EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0234 µg/L	109	63.0	143
		EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0238 µg/L	99.6	64.0	140
		EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.024 µg/L	102	67.0	138
		EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0242 µg/L	117	50.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2231148**	Page	: 1 of 9
Amendment	: **1**		
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP_20	Date Samples Received	: 21-Oct-2022
Site	: WBTA (onsite & offsite - non land holder)	Issue Date	: 13-Jan-2023
Sampler	: [redacted]	No. of samples received	: 52
Order number	: 60612563_4.1	No. of samples analysed	: 51

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

- **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
Laboratory Control Spike (LCS) Recoveries							
EP231C: Perfluoroalkyl Sulfonamides	QC-4676679-002	----	**Perfluorooctane sulfonamide (FOSA)**	754-91-6	141 %	67.0-137%	**Recovery greater than upper control limit**
EP231C: Perfluoroalkyl Sulfonamides	QC-4676679-002	----	**N-Methyl perfluorooctane sulfonamide (MeFOSA)**	31506-32-8	147 %	68.0-141%	**Recovery greater than upper control limit**

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	1	38	2.63	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	Due for extraction	Evaluation	*Analysis* Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0224_MW115_221017	**17-Oct-2022**	**02-Nov-2022**	15-Apr-2023	✓	**02-Nov-2022**	15-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)							
0224_SW008_221017, 0224_SW012_221017	**17-Oct-2022**	**03-Nov-2022**	15-Apr-2023	✓	**03-Nov-2022**	15-Apr-2023	✓
HDPE (no PTFE) (EP231X)							
0224_MW109_221018, 0224_MW104_221018, 0224_SW014_221018, 0224_MW110_221018, 0224_MW103_221018, 0224_MW118_221018, 0224_QC131_221018, 0224_QC318_221017, 0224_QC319_221018	**18-Oct-2022**	**02-Nov-2022**	16-Apr-2023	✓	**02-Nov-2022**	16-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)							

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								
0224_SW004_221018, 0224_SW013_221018, 0224_SW007_221018	0224_SW005_221018, 0224_QC130_221018,	**18-Oct-2022**	**03-Nov-2022**	16-Apr-2023	✓	**03-Nov-2022**	16-Apr-2023	✓
HDPE (no PTFE) (EP231X)								
0224_MW105_221019, 0224_MW116_221019, 0224_MW111_221019, 0224_MW112_221020, 0224_MW120_221020	0224_MW107_221019, 0224_MW108_221019, 0224_MW106_221019, 0224_MW121_221020,	**20-Oct-2022**	**02-Nov-2022**	18-Apr-2023	✓	**02-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X)								
0224_OTH001_221020, 0224_MW122_221020, 0224_POT001_221020, 0224_MW117_221019,	0224_MW119_221020, 0224_MW113_221020, 0224_POT005_221020, 0224_MW114_221020	**20-Oct-2022**	**02-Nov-2022**	18-Apr-2023	✓	**03-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)								
0224_SW009_221019, 0224_SW006_221019, 0224_QC133_221019, 0224_SW016_221020,	0224_SW025_221019, 0224_QC132_221019, 0224_SW027_221019, 0224_SW019_221020	**20-Oct-2022**	**03-Nov-2022**	18-Apr-2023	✓	**03-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X)								
0224_QC320_221019, 0224_QC135_221020, 0224_MW102_221021, 0224_QC322_221021	0224_QC134_221020, 0224_MW101_221022, 0224_QC321_221020,	**21-Oct-2022**	**02-Nov-2022**	19-Apr-2023	✓	**03-Nov-2022**	19-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)								
0224_SW018_221021,	0224_SW017_221021	**21-Oct-2022**	**03-Nov-2022**	19-Apr-2023	✓	**03-Nov-2022**	19-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
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X)							
0224_MW115_221017	**17-Oct-2022**	**02-Nov-2022**	15-Apr-2023	✓	**02-Nov-2022**	15-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)							
0224_SW008_221017, 0224_SW012_221017	**17-Oct-2022**	**03-Nov-2022**	15-Apr-2023	✓	**03-Nov-2022**	15-Apr-2023	✓
HDPE (no PTFE) (EP231X)							
0224_MW109_221018, 0224_MW104_221018, 0224_SW014_221018, 0224_MW110_221018, 0224_MW103_221018, 0224_MW118_221018, 0224_QC131_221018, 0224_QC318_221017, 0224_QC319_221018	**18-Oct-2022**	**02-Nov-2022**	16-Apr-2023	✓	**02-Nov-2022**	16-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)							
0224_SW004_221018, 0224_SW005_221018, 0224_SW013_221018, 0224_QC130_221018, 0224_SW007_221018	**18-Oct-2022**	**03-Nov-2022**	16-Apr-2023	✓	**03-Nov-2022**	16-Apr-2023	✓
HDPE (no PTFE) (EP231X)							
0224_MW105_221019, 0224_MW107_221019, 0224_MW116_221019, 0224_MW108_221019, 0224_MW111_221019, 0224_MW106_221019, 0224_MW112_221020, 0224_MW121_221020, 0224_MW120_221020	**20-Oct-2022**	**02-Nov-2022**	18-Apr-2023	✓	**02-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X)							
0224_OTH001_221020, 0224_MW119_221020, 0224_MW122_221020, 0224_MW113_221020, 0224_POT001_221020, 0224_POT005_221020, 0224_MW117_221019, 0224_MW114_221020	**20-Oct-2022**	**02-Nov-2022**	18-Apr-2023	✓	**03-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)							
0224_SW009_221019, 0224_SW025_221019, 0224_SW006_221019, 0224_QC132_221019, 0224_QC133_221019, 0224_SW027_221019, 0224_SW016_221020, 0224_SW019_221020	**20-Oct-2022**	**03-Nov-2022**	18-Apr-2023	✓	**03-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X)							
0224_QC320_221019, 0224_QC134_221020, 0224_QC135_221020, 0224_MW101_221022, 0224_MW102_221021, 0224_QC321_221020, 0224_QC322_221021	**21-Oct-2022**	**02-Nov-2022**	19-Apr-2023	✓	**03-Nov-2022**	19-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)							
0224_SW018_221021, 0224_SW017_221021	**21-Oct-2022**	**03-Nov-2022**	19-Apr-2023	✓	**03-Nov-2022**	19-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) 0224_MW115_221017	**17-Oct-2022**	**02-Nov-2022**	15-Apr-2023	✓	**02-Nov-2022**	15-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL) 0224_SW008_221017, 0224_SW012_221017	**17-Oct-2022**	**03-Nov-2022**	15-Apr-2023	✓	**03-Nov-2022**	15-Apr-2023	✓
HDPE (no PTFE) (EP231X) 0224_MW109_221018, 0224_MW104_221018, 0224_SW014_221018, 0224_MW110_221018, 0224_MW103_221018, 0224_MW118_221018, 0224_QC131_221018, 0224_QC318_221017, 0224_QC319_221018	**18-Oct-2022**	**02-Nov-2022**	16-Apr-2023	✓	**02-Nov-2022**	16-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL) 0224_SW004_221018, 0224_SW005_221018, 0224_SW013_221018, 0224_QC130_221018, 0224_SW007_221018	**18-Oct-2022**	**03-Nov-2022**	16-Apr-2023	✓	**03-Nov-2022**	16-Apr-2023	✓
HDPE (no PTFE) (EP231X) 0224_MW105_221019, 0224_MW107_221019, 0224_MW116_221019, 0224_MW108_221019, 0224_MW111_221019, 0224_MW106_221019, 0224_MW112_221020, 0224_MW121_221020, 0224_MW120_221020	**20-Oct-2022**	**02-Nov-2022**	18-Apr-2023	✓	**02-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X) 0224_OTH001_221020, 0224_MW119_221020, 0224_MW122_221020, 0224_MW113_221020, 0224_POT001_221020, 0224_POT005_221020, 0224_MW117_221019, 0224_MW114_221020	**20-Oct-2022**	**02-Nov-2022**	18-Apr-2023	✓	**03-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL) 0224_SW009_221019, 0224_SW025_221019, 0224_SW006_221019, 0224_QC132_221019, 0224_QC133_221019, 0224_SW027_221019, 0224_SW016_221020, 0224_SW019_221020	**20-Oct-2022**	**03-Nov-2022**	18-Apr-2023	✓	**03-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X) 0224_QC320_221019, 0224_QC134_221020, 0224_QC135_221020, 0224_MW101_221022, 0224_MW102_221021, 0224_QC321_221020, 0224_QC322_221021	**21-Oct-2022**	**02-Nov-2022**	19-Apr-2023	✓	**03-Nov-2022**	19-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL) 0224_SW018_221021, 0224_SW017_221021	**21-Oct-2022**	**03-Nov-2022**	19-Apr-2023	✓	**03-Nov-2022**	19-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
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X)							
0224_MW115_221017	**17-Oct-2022**	**02-Nov-2022**	15-Apr-2023	✓	**02-Nov-2022**	15-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)							
0224_SW008_221017, 0224_SW012_221017	**17-Oct-2022**	**03-Nov-2022**	15-Apr-2023	✓	**03-Nov-2022**	15-Apr-2023	✓
HDPE (no PTFE) (EP231X)							
0224_MW109_221018, 0224_MW104_221018, 0224_SW014_221018, 0224_MW110_221018, 0224_MW103_221018, 0224_MW118_221018, 0224_QC131_221018, 0224_QC318_221017, 0224_QC319_221018	**18-Oct-2022**	**02-Nov-2022**	16-Apr-2023	✓	**02-Nov-2022**	16-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)							
0224_SW004_221018, 0224_SW005_221018, 0224_SW013_221018, 0224_QC130_221018, 0224_SW007_221018	**18-Oct-2022**	**03-Nov-2022**	16-Apr-2023	✓	**03-Nov-2022**	16-Apr-2023	✓
HDPE (no PTFE) (EP231X)							
0224_MW105_221019, 0224_MW107_221019, 0224_MW116_221019, 0224_MW108_221019, 0224_MW111_221019, 0224_MW106_221019, 0224_MW112_221020, 0224_MW121_221020, 0224_MW120_221020	**20-Oct-2022**	**02-Nov-2022**	18-Apr-2023	✓	**02-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X)							
0224_OTH001_221020, 0224_MW119_221020, 0224_MW122_221020, 0224_MW113_221020, 0224_POT001_221020, 0224_POT005_221020, 0224_MW117_221019, 0224_MW114_221020	**20-Oct-2022**	**02-Nov-2022**	18-Apr-2023	✓	**03-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)							
0224_SW009_221019, 0224_SW025_221019, 0224_SW006_221019, 0224_QC132_221019, 0224_QC133_221019, 0224_SW027_221019, 0224_SW016_221020, 0224_SW019_221020	**20-Oct-2022**	**03-Nov-2022**	18-Apr-2023	✓	**03-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X)							
0224_QC320_221019, 0224_QC134_221020, 0224_QC135_221020, 0224_MW101_221022, 0224_MW102_221021, 0224_QC321_221020, 0224_QC322_221021	**21-Oct-2022**	**02-Nov-2022**	19-Apr-2023	✓	**03-Nov-2022**	19-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)							
0224_SW018_221021, 0224_SW017_221021	**21-Oct-2022**	**03-Nov-2022**	19-Apr-2023	✓	**03-Nov-2022**	19-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
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X)							
0224_MW115_221017	**17-Oct-2022**	**02-Nov-2022**	15-Apr-2023	✓	**02-Nov-2022**	15-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)							
0224_SW008_221017, 0224_SW012_221017	**17-Oct-2022**	**03-Nov-2022**	15-Apr-2023	✓	**03-Nov-2022**	15-Apr-2023	✓
HDPE (no PTFE) (EP231X)							
0224_MW109_221018, 0224_MW104_221018, 0224_SW014_221018, 0224_MW110_221018, 0224_MW103_221018, 0224_MW118_221018, 0224_QC131_221018, 0224_QC318_221017, 0224_QC319_221018	**18-Oct-2022**	**02-Nov-2022**	16-Apr-2023	✓	**02-Nov-2022**	16-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)							
0224_SW004_221018, 0224_SW005_221018, 0224_SW013_221018, 0224_QC130_221018, 0224_SW007_221018	**18-Oct-2022**	**03-Nov-2022**	16-Apr-2023	✓	**03-Nov-2022**	16-Apr-2023	✓
HDPE (no PTFE) (EP231X)							
0224_MW105_221019, 0224_MW107_221019, 0224_MW116_221019, 0224_MW108_221019, 0224_MW111_221019, 0224_MW106_221019, 0224_MW112_221020, 0224_MW121_221020, 0224_MW120_221020	**20-Oct-2022**	**02-Nov-2022**	18-Apr-2023	✓	**02-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X)							
0224_OTH001_221020, 0224_MW119_221020, 0224_MW122_221020, 0224_MW113_221020, 0224_POT001_221020, 0224_POT005_221020, 0224_MW117_221019, 0224_MW114_221020	**20-Oct-2022**	**02-Nov-2022**	18-Apr-2023	✓	**03-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)							
0224_SW009_221019, 0224_SW025_221019, 0224_SW006_221019, 0224_QC132_221019, 0224_QC133_221019, 0224_SW027_221019, 0224_SW016_221020, 0224_SW019_221020	**20-Oct-2022**	**03-Nov-2022**	18-Apr-2023	✓	**03-Nov-2022**	18-Apr-2023	✓
HDPE (no PTFE) (EP231X)							
0224_QC320_221019, 0224_QC134_221020, 0224_QC135_221020, 0224_MW101_221022, 0224_MW102_221021, 0224_QC321_221020, 0224_QC322_221021	**21-Oct-2022**	**02-Nov-2022**	19-Apr-2023	✓	**03-Nov-2022**	19-Apr-2023	✓
HDPE (no PTFE) (EP231X-LL)							
0224_SW018_221021, 0224_SW017_221021	**21-Oct-2022**	**03-Nov-2022**	19-Apr-2023	✓	**03-Nov-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-LL	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
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-LL	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
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-LL	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
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-LL	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
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.
Per- and Polyfluoroalkyl Substances (PFAS by LCMSMS	EP231X-LL	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 concentrated, combined with an equal volume of 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
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 : **EB2231149**

Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: PO BOX 1307 FORTITUDE VALLEY 4006	Address	: [redacted]
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: QLD_0224_PFASOMP_20	Page	: 1 of 3
Order number	: 60612563_4.1	Quote number	: ES2019AECOMAU0030 (SY/139/19 V3)
C-O-C number	: 43866	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Landholder 1		
Sampler	: [redacted]		

Dates

Date Samples Received	: 21-Oct-2022 17:10	Issue Date	: 24-Oct-2022
Client Requested Due Date	: 31-Oct-2022	Scheduled Reporting Date	: **31-Oct-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 9.1°C, 7.4°C - Ice present
Receipt Detail	: HADR ESKY	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
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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 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-LL PFAS - Full Suite Low Level (28 analytes)
EB2231149-001	20-Oct-2022 00:57	0224_SW021_221019	✓

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]

- *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]

[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 - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	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]
- A4 - AU Tax Invoice (INV)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	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]
- A4 - AU Tax Invoice (INV)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2231149**	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	: QLD_0224_PFASOMP_20	Date Samples Received	: 21-Oct-2022 17:10
Order number	: 60612563_4.1	Date Analysis Commenced	: 26-Oct-2022
C-O-C number	: 43866	Issue Date	: 28-Oct-2022 19:48
Sampler	: [redacted]		
Site	: Landholder 1		
Quote number	: SY/139/19 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]	2IC Organic Chemist	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 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: SURFACE WATER (Matrix: WATER)				Sample ID	0224_SW021_221019	----	----	----	----
				Sampling date / time	20-Oct-2022 00:57	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2231149-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		<0.002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		<0.002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		<0.002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		<0.002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		<0.002	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		<0.01	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		<0.002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		<0.002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		<0.002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		<0.002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.005	----	----	----	----
Perfluorohexadecanoic acid (PFHxDA)	67905-19-5	0.005	µg/L		<0.005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.005	----	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0224_SW021_221019	----	----	----	----
				Sampling date / time	20-Oct-2022 00:57	----	----	----	----
Compound	CAS Number	LOR	Unit		EB2231149-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.002	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		<0.002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		<0.002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.002	µg/L		<0.002	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**98.1**	----	----	----	----
13C8-PFOA	----	0.002	%		**95.6**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2231149**	Page	: 1 of 4
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP_20	Date Samples Received	: 21-Oct-2022
Order number	: 60612563_4.1	Date Analysis Commenced	: 26-Oct-2022
C-O-C number	: 43866	Issue Date	: 28-Oct-2022
Sampler	: [redacted]		
Site	: Landholder 1		
Quote number	: SY/139/19 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]	2IC Organic Chemist	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%.

- **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: 4663107)								
EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	0.0222 µg/L	87.8	72.0	130
EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	0.0235 µg/L	86.8	71.0	127
EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	0.0237 µg/L	78.0	68.0	131
EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	0.0238 µg/L	84.9	69.0	134
EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	0.0232 µg/L	74.6	65.0	140
EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	0.0241 µg/L	75.1	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4663107)								
EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	0.125 µg/L	75.1	73.0	129
EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	0.025 µg/L	80.8	72.0	129
EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	0.025 µg/L	83.2	72.0	129
EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	0.025 µg/L	94.0	72.0	130
EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	0.025 µg/L	102	71.0	133
EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	0.025 µg/L	90.0	69.0	130
EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	0.025 µg/L	83.2	71.0	129
EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	0.025 µg/L	95.6	69.0	133
EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	0.025 µg/L	92.8	72.0	134
EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	0.025 µg/L	79.2	65.0	144
EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	0.0625 µg/L	89.1	71.0	132
EP231X-LL: Perfluorohexadecanoic acid (PFHxDA)	67905-19-5	0.005	µg/L	<0.005	0.025 µg/L	91.2	38.8	149
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4663107)								
EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	0.025 µg/L	80.4	67.0	137
EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	0.0625 µg/L	86.2	68.0	141
EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	0.0625 µg/L	87.0	57.9	141
EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	0.0625 µg/L	82.4	63.3	134
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	0.0625 µg/L	78.7	60.0	136
EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	0.025 µg/L	84.4	65.0	136
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	0.025 µg/L	87.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4663107)								
EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	0.0234 µg/L	74.8	63.0	143

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: 4663107) - continued								
EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	0.0238 µg/L	97.9	64.0	140
EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	0.024 µg/L	77.5	67.0	138
EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	0.0242 µg/L	75.6	53.1	133
EP231P: PFAS Sums (QCLot: 4663107)								
EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFAS (WA DER List)	----	0.002	µg/L	<0.002	----	----	----	----

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	: **EB2231149**	Page	: 1 of 4
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP_20	Date Samples Received	: 21-Oct-2022
Site	: Landholder 1	Issue Date	: 28-Oct-2022
Sampler	: [redacted]	No. of samples received	: 1
Order number	: 60612563_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.**
- **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	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS by LCMSMS	0	6	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-LL) 0224_SW021_221019	**20-Oct-2022**	**26-Oct-2022**	17-Apr-2023	✓	**27-Oct-2022**	17-Apr-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-LL) 0224_SW021_221019	**20-Oct-2022**	**26-Oct-2022**	17-Apr-2023	✓	**27-Oct-2022**	17-Apr-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-LL) 0224_SW021_221019	**20-Oct-2022**	**26-Oct-2022**	17-Apr-2023	✓	**27-Oct-2022**	17-Apr-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL) 0224_SW021_221019	**20-Oct-2022**	**26-Oct-2022**	17-Apr-2023	✓	**27-Oct-2022**	17-Apr-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-LL) 0224_SW021_221019	**20-Oct-2022**	**26-Oct-2022**	17-Apr-2023	✓	**27-Oct-2022**	17-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-LL	0	6	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS by LCMSMS	EP231X-LL	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS by LCMSMS	EP231X-LL	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS by LCMSMS	EP231X-LL	0	6	**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-LL	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 concentrated, combined with an equal volume of 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
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 : **EB2231150**

Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: PO BOX 1307 FORTITUDE VALLEY 4006	Address	: [redacted]
E-mail	: [redacted]	E-mail	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Facsimile	: ----	Facsimile	: [redacted]
Project	: QLD_0224_PFASOMP_20	Page	: 1 of 3
Order number	: 60612563_4.1	Quote number	: ES2019AECOMAU0030 (SY/139/19 V3)
C-O-C number	: 43867	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: Landholder 2		
Sampler	: [redacted]		

Dates

Date Samples Received	: 21-Oct-2022 17:10	Issue Date	: 24-Oct-2022
Client Requested Due Date	: 31-Oct-2022	Scheduled Reporting Date	: **31-Oct-2022**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 9.1°C, 7.4°C - Ice present
Receipt Detail	: HARD ESKY	No. of samples received / analysed	: 2 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Discounted Package Prices apply only when specific ALS Group Codes ('W', 'S', 'NT' suites) are referenced on COCs.
- Please direct any turn around / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Analysis will be conducted by ALS Environmental, Brisbane, NATA accreditation no. 825, Site No. 818 (Micro site no. 18958).
- **Breaches in recommended extraction / analysis holding times (if any) are displayed overleaf in the Proactive Holding Time Report table.**
- 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.
- **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 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-LL PFAS - Full Suite Low Level (28 analytes)
EB2231150-001	20-Oct-2022 01:00	0224_SW023_221019	✓
EB2231150-002	20-Oct-2022 01:01	0224_SW022_221019	✓

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]

- *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]

[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 - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	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]
- A4 - AU Tax Invoice (INV)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	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]
- A4 - AU Tax Invoice (INV)	Email	[redacted]
- Chain of Custody (CoC) (COC)	Email	[redacted]
- EDI Format - EQUIS V5 AECOM (EQUIS_V5_AECOM)	Email	[redacted]
- EDI Format - ESDAT (ESDAT)	Email	[redacted]
- EDI Format - XTab (XTAB)	Email	[redacted]

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2231150**	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	: QLD_0224_PFASOMP_20	Date Samples Received	: 21-Oct-2022 17:10
Order number	: 60612563_4.1	Date Analysis Commenced	: 26-Oct-2022
C-O-C number	: 43867	Issue Date	: 28-Oct-2022 19:49
Sampler	: [redacted]		
Site	: Landholder 2		
Quote number	: SY/139/19 V3		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]	2IC Organic Chemist	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 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: SURFACE WATER (Matrix: WATER)				Sample ID	0224_SW023_221019	0224_SW022_221019	----	----	----
				Sampling date / time	20-Oct-2022 01:00	20-Oct-2022 01:01	----	----	----
Compound	CAS Number	LOR	Unit		EB2231150-001	EB2231150-002	--------	--------	--------
					Result	Result	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		<0.002	<0.002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		<0.002	<0.002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		<0.002	<0.002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		<0.002	<0.002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		<0.002	<0.002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.002	<0.002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		<0.01	<0.01	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		<0.002	<0.002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		<0.002	<0.002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		<0.002	<0.002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		<0.002	<0.002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.002	<0.002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.002	<0.002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.002	<0.002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.002	<0.002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L		<0.002	<0.002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.005	<0.005	----	----	----
Perfluorohexadecanoic acid (PFHxDA)	67905-19-5	0.005	µg/L		<0.005	<0.005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.002	<0.002	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.005	<0.005	----	----	----

Analytical Results

Sub-Matrix: SURFACE WATER (Matrix: WATER)				Sample ID	0224_SW023_221019	0224_SW022_221019	----	----	----
				Sampling date / time	20-Oct-2022 01:00	20-Oct-2022 01:01	----	----	----
Compound	CAS Number	LOR	Unit		EB2231150-001	EB2231150-002	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.005	<0.005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.005	<0.005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.005	<0.005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.002	<0.002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.002	<0.002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.005	<0.005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.005	<0.005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.005	<0.005	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.005	<0.005	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		<0.002	<0.002	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		<0.002	<0.002	----	----	----
Sum of PFAS (WA DER List)	----	0.002	µg/L		<0.002	<0.002	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		**89.4**	**95.2**	----	----	----
13C8-PFOA	----	0.002	%		**107**	**112**	----	----	----

Surrogate Control Limits

Sub-Matrix: **SURFACE WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP231S: PFAS Surrogate			
13C4-PFOS	----	65	140
13C8-PFOA	----	71	133

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2231150**	Page	: 1 of 4
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Contact	: [redacted]
Address	: [redacted]	Address	: [redacted]
Telephone	: ----	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP_20	Date Samples Received	: 21-Oct-2022
Order number	: 60612563_4.1	Date Analysis Commenced	: 26-Oct-2022
C-O-C number	: 43867	Issue Date	: 28-Oct-2022
Sampler	: [redacted]		
Site	: Landholder 2		
Quote number	: SY/139/19 V3		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
[redacted]	2IC Organic Chemist	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%.

- **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: 4663107)								
EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	0.0222 µg/L	87.8	72.0	130
EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	0.0235 µg/L	86.8	71.0	127
EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	0.0237 µg/L	78.0	68.0	131
EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	0.0238 µg/L	84.9	69.0	134
EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	0.0232 µg/L	74.6	65.0	140
EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	0.0241 µg/L	75.1	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 4663107)								
EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	0.125 µg/L	75.1	73.0	129
EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	0.025 µg/L	80.8	72.0	129
EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	0.025 µg/L	83.2	72.0	129
EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	0.025 µg/L	94.0	72.0	130
EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	0.025 µg/L	102	71.0	133
EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	0.025 µg/L	90.0	69.0	130
EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	0.025 µg/L	83.2	71.0	129
EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	0.025 µg/L	95.6	69.0	133
EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	0.025 µg/L	92.8	72.0	134
EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	0.025 µg/L	79.2	65.0	144
EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	0.0625 µg/L	89.1	71.0	132
EP231X-LL: Perfluorohexadecanoic acid (PFHxDA)	67905-19-5	0.005	µg/L	<0.005	0.025 µg/L	91.2	38.8	149
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 4663107)								
EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	0.025 µg/L	80.4	67.0	137
EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	0.0625 µg/L	86.2	68.0	141
EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	0.0625 µg/L	87.0	57.9	141
EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	0.0625 µg/L	82.4	63.3	134
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	0.0625 µg/L	78.7	60.0	136
EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	0.025 µg/L	84.4	65.0	136
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	0.025 µg/L	87.2	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 4663107)								
EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	0.0234 µg/L	74.8	63.0	143

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: 4663107) - continued								
EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	0.0238 µg/L	97.9	64.0	140
EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	0.024 µg/L	77.5	67.0	138
EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	0.0242 µg/L	75.6	53.1	133
EP231P: PFAS Sums (QCLot: 4663107)								
EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFAS (WA DER List)	----	0.002	µg/L	<0.002	----	----	----	----

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	: **EB2231150**	Page	: 1 of 4
Client	: **AECOM AUSTRALIA PTY LTD**	Laboratory	: Environmental Division Brisbane
Contact	: [redacted]	Telephone	: [redacted]
Project	: QLD_0224_PFASOMP_20	Date Samples Received	: 21-Oct-2022
Site	: Landholder 2	Issue Date	: 28-Oct-2022
Sampler	: [redacted]	No. of samples received	: 2
Order number	: 60612563_4.1	No. of samples analysed	: 2

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **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	6	0.00	10.00	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS by LCMSMS	0	6	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-LL)							
0224_SW023_221019, 0224_SW022_221019	**20-Oct-2022**	**26-Oct-2022**	18-Apr-2023	✓	**27-Oct-2022**	18-Apr-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-LL)							
0224_SW023_221019, 0224_SW022_221019	**20-Oct-2022**	**26-Oct-2022**	18-Apr-2023	✓	**27-Oct-2022**	18-Apr-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-LL)							
0224_SW023_221019, 0224_SW022_221019	**20-Oct-2022**	**26-Oct-2022**	18-Apr-2023	✓	**27-Oct-2022**	18-Apr-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL)							
0224_SW023_221019, 0224_SW022_221019	**20-Oct-2022**	**26-Oct-2022**	18-Apr-2023	✓	**27-Oct-2022**	18-Apr-2023	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-LL)							
0224_SW023_221019, 0224_SW022_221019	**20-Oct-2022**	**26-Oct-2022**	18-Apr-2023	✓	**27-Oct-2022**	18-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-LL	0	6	**0.00**	**10.00**	×	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS by LCMSMS	EP231X-LL	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS by LCMSMS	EP231X-LL	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS by LCMSMS	EP231X-LL	0	6	**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-LL	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 concentrated, combined with an equal volume of 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
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: CATHERINE HANSEN

Customer: AECOM AUSTRALIA PTY LTD

Address: LEVEL 8
FORTITUDE VALLEY QLD 4006

Email: catherine.hansen@aecom.com

Telephone:

Fax:

LABORATORY DETAILS

Lab: National Measurement Institute

Contact: Susanne Neuman

Address: 105 Delhi Road, North Ryde, NSW
NSW 2113

Email: Susanne.Neuman@measurement.gov.au

Telephone: 02 9449 0181

Fax:

SAMPLE DETAILS

NMI Job Name: AECO06/221026

Total No. of Samples: 6

LRNs	Estimated Report Date	Customer Sample ID	Lab Sample Description
N22/021041	2-NOV-2022	0224_QC230_221018	WATER 18/10/2022

N22/021042	2-NOV-2022	0224_QC231_221018	WATER 18/10/2022
N22/021043	2-NOV-2022	0224_QC232_221019	WATER 19/10/2022
N22/021044	2-NOV-2022	0224_QC233_221019	WATER 19/10/2022
N22/021045	2-NOV-2022	0224_QC234_221020	WATER 20/10/2022
N22/021046	2-NOV-2022	0224_QC235_221020	WATER 20/10/2022

SAMPLE RECEIVED CONDITION

Date samples received:	26-OCT-2022
Sample received in good order:	Yes
NMI Quotation no. provided:	QLD_0224_PFASOMP_20
Client purchase order number:	60612563_4_1
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

REPORT OF ANALYSIS

Report No. RN1370853

Client	: [redacted]	**Job No.**	: AECO06/221026
	[redacted]	**Quote No.**	: QT-02018
	[redacted]	**Order No.**	: 60612563_4_1
		Date Received	: 26-OCT-2022
Attention	: [redacted]	**Sampled By**	: CLIENT
Project Name	: QLD_0224_PFASOMP_20		
Your Client Services Manager	: [redacted]	**Phone**	: 02 9449 0169

Lab Reg No.	Sample Ref	Sample Description
N22/021041	0224_QC230_221018	WATER 18/10/2022
N22/021042	0224_QC231_221018	WATER 18/10/2022
N22/021043	0224_QC232_221019	WATER 19/10/2022
N22/021044	0224_QC233_221019	WATER 19/10/2022

Lab Reg No.		N22/021041	N22/021042	N22/021043	N22/021044	
Date Sampled		18-OCT-2022	18-OCT-2022	19-OCT-2022	19-OCT-2022	
	Units					Method
PFAS (per-and poly-fluoroalkyl substances)						
PFBA (375-22-4)	ug/L	<0.05	<0.05	<0.05	<0.05	NR70
PFPeA (2706-90-3)	ug/L	<0.02	<0.02	<0.02	<0.02	NR70
PFHxA (307-24-4)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
PFHpA (375-85-9)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
PFOA (335-67-1)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
PFNA (375-95-1)	ug/L	<0.01	<0.01	<0.01	<0.01	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	<0.01	<0.01	<0.01	NR70
PFHxS (355-46-4)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
PFHpS (375-92-8)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
PFOS (1763-23-1)	ug/L	<0.02	<0.02	<0.02	<0.02	NR70
PFNS (68259-12-1)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
PFBS (375-73-5)	ug/L	<0.01	<0.01	<0.01	<0.01	NR70
PFOSA (754-91-6)	ug/L	<0.01	<0.01	<0.01	<0.01	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

Lab Reg No.		N22/021041	N22/021042	N22/021043	N22/021044	
Date Sampled		18-OCT-2022	18-OCT-2022	19-OCT-2022	19-OCT-2022	
	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	<0.01	NR70
8:2 FTS (39108-34-4)	ug/L	<0.01	<0.01	<0.01	<0.01	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)	%	135	140	136	139	NR70
PFPeA (Surrogate Recovery)	%	173	147	178	181	NR70
PFHxA (Surrogate Recovery)	%	133	144	126	136	NR70
PFHpA (Surrogate Recovery)	%	133	136	125	140	NR70
PFOA (Surrogate Recovery)	%	137	146	141	143	NR70
PFNA (Surrogate Recovery)	%	147	147	130	131	NR70
PFDA (Surrogate Recovery)	%	139	146	138	142	NR70
PFUdA (Surrogate Recovery)	%	137	141	136	127	NR70
PFDoA (Surrogate Recovery)	%	121	135	116	109	NR70
PFTeDA (Surrogate Recovery)	%	116	154	113	99	NR70
PFHxDA (Surrogate Recovery)	%	134	164	117	118	NR70
FOUEA (Surrogate Recovery)	%	111	106	105	106	NR70
PFBS (Surrogate Recovery)	%	141	149	137	143	NR70
PFHxS (Surrogate Recovery)	%	121	132	122	130	NR70
PFOS (Surrogate Recovery)	%	132	136	139	139	NR70
PFOSA (Surrogate Recovery)	%	131	125	120	111	NR70
N-MeFOSA (Surrogate Recovery)	%	86	98	82	77	NR70
N-EtFOSA (Surrogate Recovery)	%	74	97	73	65	NR70
N-MeFOSAA (Surrogate Recovery)	%	103	130	118	104	NR70
N-EtFOSAA (Surrogate Recovery)	%	84	123	97	86	NR70
N-MeFOSE (Surrogate Recovery)	%	89	120	90	86	NR70
N-EtFOSE (Surrogate Recovery)	%	75	110	76	69	NR70
4:2 FTS (Surrogate Recovery)	%	144	125	196	174	NR70
6:2 FTS (Surrogate Recovery)	%	120	122	127	123	NR70
8:2 FTS (Surrogate Recovery)	%	123	131	117	124	NR70
8:2 diPAP (Surrogate Recovery)	%	126	137	97	91	NR70
Dates						
Date extracted		31-OCT-2022	31-OCT-2022	31-OCT-2022	31-OCT-2022	
Date analysed		31-OCT-2022	31-OCT-2022	31-OCT-2022	31-OCT-2022	

N22/021041
to
N22/021046

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]
Accreditation No. 198

02-NOV-2022

REPORT OF ANALYSIS

Report No. RN1370853

Client	: [redacted]	**Job No.**	: AECO06/221026
	[redacted]	**Quote No.**	: QT-02018
	[redacted]	**Order No.**	: 60612563_4_1
		Date Received	: 26-OCT-2022
Attention	: [redacted]	**Sampled By**	: CLIENT
Project Name	: QLD_0224_PFASOMP_20		
Your Client Services Manager	: [redacted]	**Phone**	: [redacted]

Lab Reg No.	Sample Ref	Sample Description
N22/021045	0224_QC234_221020	WATER 20/10/2022
N22/021046	0224_QC235_221020	WATER 20/10/2022

Lab Reg No.		N22/021045	N22/021046			
Date Sampled		20-OCT-2022	20-OCT-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	<0.01	<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	0.036	0.085			NR70
PFHpS (375-92-8)	ug/L	<0.01	<0.01			NR70
PFOS (1763-23-1)	ug/L	<0.02	0.024			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.		N22/021045	N22/021046			
Date Sampled		20-OCT-2022	20-OCT-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)	%	133	129			NR70
PFPeA (Surrogate Recovery)	%	143	136			NR70
PFHxA (Surrogate Recovery)	%	148	145			NR70
PFHpA (Surrogate Recovery)	%	137	142			NR70
PFOA (Surrogate Recovery)	%	144	146			NR70
PFNA (Surrogate Recovery)	%	139	140			NR70
PFDA (Surrogate Recovery)	%	149	143			NR70
PFUdA (Surrogate Recovery)	%	133	138			NR70
PFDoA (Surrogate Recovery)	%	130	125			NR70
PFTeDA (Surrogate Recovery)	%	149	138			NR70
PFHxDA (Surrogate Recovery)	%	171	162			NR70
FOUEA (Surrogate Recovery)	%	103	97			NR70
PFBS (Surrogate Recovery)	%	144	142			NR70
PFHxS (Surrogate Recovery)	%	136	127			NR70
PFOS (Surrogate Recovery)	%	135	144			NR70
PFOSA (Surrogate Recovery)	%	129	118			NR70
N-MeFOSA (Surrogate Recovery)	%	118	98			NR70
N-EtFOSA (Surrogate Recovery)	%	112	100			NR70
N-MeFOSAA (Surrogate Recovery)	%	121	120			NR70
N-EtFOSAA (Surrogate Recovery)	%	116	108			NR70
N-MeFOSE (Surrogate Recovery)	%	121	108			NR70
N-EtFOSE (Surrogate Recovery)	%	111	97			NR70
4:2 FTS (Surrogate Recovery)	%	127	126			NR70
6:2 FTS (Surrogate Recovery)	%	119	124			NR70
8:2 FTS (Surrogate Recovery)	%	132	120			NR70
8:2 diPAP (Surrogate Recovery)	%	129	120			NR70
Dates						
Date extracted		31-OCT-2022	31-OCT-2022			
Date analysed		31-OCT-2022	31-OCT-2022			

[redacted]

[redacted]

Accreditation No. 198

02-NOV-2022

REPORT OF ANALYSIS

This Report supersedes reports: *RN1370828*

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: AECO06/221026 **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	88	NA
PFPeA (2706-90-3)	NR70	0.02	<0.02	NA	NA	NA	76	NA
PFHxA (307-24-4)	NR70	0.01	<0.01	NA	NA	NA	89	NA
PFHpA (375-85-9)	NR70	0.01	<0.01	NA	NA	NA	80	NA
PFOA (335-67-1)	NR70	0.01	<0.01	NA	NA	NA	89	NA
PFNA (375-95-1)	NR70	0.01	<0.01	NA	NA	NA	84	NA
PFDA (335-76-2)	NR70	0.01	<0.01	NA	NA	NA	87	NA
PFUdA (2058-94-8)	NR70	0.01	<0.01	NA	NA	NA	80	NA
PFDoA (307-55-1)	NR70	0.01	<0.01	NA	NA	NA	84	NA
PFTrDA (72629-94-8)	NR70	0.02	<0.02	NA	NA	NA	85	NA
PFTeDA (376-06-7)	NR70	0.02	<0.02	NA	NA	NA	83	NA
PFHxDA (67905-19-5)	NR70	0.02	<0.02	NA	NA	NA	89	NA
PFODA (16517-11-6)	NR70	0.05	<0.05	NA	NA	NA	78	NA
FOUEA (70887-84-2)	NR70	0.01	<0.01	NA	NA	NA	91	NA
PFBS (375-73-5)	NR70	0.01	<0.01	NA	NA	NA	80	NA
PFPeS (2706-91-4)	NR70	0.01	<0.01	NA	NA	NA	81	NA
PFHxS (355-46-4)	NR70	0.01	<0.01	NA	NA	NA	83	NA
PFHpS (375-92-8)	NR70	0.01	<0.01	NA	NA	NA	92	NA
PFOS (1763-23-1)	NR70	0.02	<0.02	NA	NA	NA	81	NA
PFNS (68259-12-1)	NR70	0.01	<0.01	NA	NA	NA	82	NA
PFDS (335-77-3)	NR70	0.01	<0.01	NA	NA	NA	77	NA
PFOSA (754-91-6)	NR70	0.01	<0.01	NA	NA	NA	86	NA
N-MeFOSA (31506-32-8)	NR70	0.02	<0.02	NA	NA	NA	80	NA
N-EtFOSA (4151-50-2)	NR70	0.02	<0.02	NA	NA	NA	82	NA
N-MeFOSAA (2355-31-9)	NR70	0.01	<0.01	NA	NA	NA	81	NA
N-EtFOSAA(2991-50-6)	NR70	0.01	<0.01	NA	NA	NA	85	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	88	NA
4:2 FTS (757124-72-4)	NR70	0.01	<0.01	NA	NA	NA	85	NA
6:2 FTS (27619-97-2)	NR70	0.01	<0.01	NA	NA	NA	90	NA
8:2 FTS (39108-34-4)	NR70	0.01	<0.01	NA	NA	NA	74	NA
10:2 FTS (120226-60-0)	NR70	0.01	<0.01	NA	NA	NA	78	NA
8:2 diPAP (678-41-1)	NR70	0.02	<0.02	NA	NA	NA	98	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: **2/11/2022**

Appendix F

Equipment Calibration Certificates

Appendix F Equipment Calibration Certificates

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003842-9003846 - INTERFACE METER

Plant Number: 235271

Probe Length: 30m

ITEM	TEST	PASS	COMMENTS
Battery	Compartment / Capacity	☑	9v
Probe	Clean / Operation	☑	
Earth Lead	Check if equipped	☑	
Tape Check	Cleaned / Checked for cuts	☑	
Function test	At surface level	☑	

Note: Calibration traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: [redacted] Date: 21/9/22 Signed: C[illegible]

Accessories List:

Interface Meter	Tape Guide	Decon 90 Solution
Brush	Spare 9v Battery	Instruction Manual
Transport Box		

EQUIPMENT CERTIFICATION REPORT

KENNARDS HIRE

PGN9003871 WATER QUALITY METER – MULTIFUNCTION

Plant Number: 1072178

SENSOR	CONCENTRATION	SPAN 1	SPAN 2	TRACEABILITY	PASS
pH	pH 7.00 / pH 4.00	7.00 pH	4.00 pH	377339 380327	☑
Conductivity	2.76 mS/cm @ 25°C	2.76 mS/cm		377099	☑
Dissolved Oxygen	Sodium Sulphite / Air	0.0% in Sodium Sulphite	% Saturation in Air	12110	☑
ORP	240mV @ 25°C	240mV	-	7221	☑

Battery Status 100 %	Temperature 21 °C
	Electrodes Cleaned and Checked

Note: Calibration solution traceability information is available upon request.

Please clean/decontaminate instrument and accessories before returning. A minimum 'Cleaning Fee' $55.00 (Inc GST) may apply if instrument is returned contaminated.

Checked By: [redacted] Date: 13/10/22 Signed:

Accessories List:

User's Manual & USB	pH Sensor	Conductivity Sensor
Dissolved Oxygen Sensor with Wetting Cap	Redox (ORP) Sensor with Wetting Cap	Flow Cell 500ml
Comm Cable	Testing Cap	Storage Cap

AECOM

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	OMP WBTA	**Project Number:**	60612563
Project Location:	Wide Bay	**Client:**	Defence
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:	Kennards
Make and Model:	YSI PRO Series
Serial Number:	20D101954

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	17.10.22 13:~~55~~35				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	~~ppm~~ mg/L	~~ppm~~ ORP
Calibration Standard Concentration:	4.00	7.00	~~2760~~ 2765	0	224.8
Calibration Reading:	3.94	7.07	2552	0.00	221.45
Calibration Temperature:	26.0	26.3	26.5	26.7	27

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	17.10.22 13:35				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	~~ppm~~ mg/L	~~ppm~~ ORP
Calibration Standard Concentration:	4.00	7.00	~~2760~~ 2765	0	224.8
Bump Test Reading:	4.01	7.03	2953	0.00	227.6
Bump Test Temperature:	26.4	26.5	27.3	26.7	27.3

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

EC would not cal within tolerance

Approval and Distribution

☑ Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

[redacted]

Fieldwork Staff Signature

17.10.22

Date

Distribution: Project Central File

AECOM

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	OMP WBTA	**Project Number:**	60612563
Project Location:	Wide Bay	**Client:**	Defence
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:	Kennards
Make and Model:	YSI Pro Series
Serial Number:	20D 101954

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	18.10.22 06:30				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	~~ppm~~ mg/L	~~ppm~~ ORP
Calibration Standard Concentration:	4.00	7.00	2549	0.00	237.8
Calibration Reading:	4.07	6.99	2544	0.03	[redacted] 255.4
Calibration Temperature:	21.0	21.2	21.0	21.3	21.2

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	18.10.22 06:30				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	~~ppm~~ mg/L	~~ppm~~ ORP
Calibration Standard Concentration:	4.00	7.00	2549	0.00	237.8
Bump Test Reading:	4.07	7.03	2559	0.01	256.0
Bump Test Temperature:	21.2	21.2	21.4	21.3	21.4

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

Approval and Distribution

☑ Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

[redacted] — Fieldwork Staff Signature

18.10.22 — Date

Distribution: Project Central File

AECOM

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	OMP WBTA	**Project Number:**	60612563
Project Location:	Wide Bay	**Client:**	Defence
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:	Kennards
Make and Model:	YSI Pro Series
Serial Number:	

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	19.10.22 06:10				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	~~ppm~~ mg/L	~~ppm~~ ORP
Calibration Standard Concentration:	4.00	7.00	2602	0	235.6
Calibration Reading:	4.03	7.13	2481	0.00	~~256~~ 251.1
Calibration Temperature:	21.8	21.7	21.7	21.7	21.8

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	19.10.22 06:15				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	~~ppm~~ mg/L	~~ppm~~ ORP
Calibration Standard Concentration:	4.00	7.00	2602	0	235.6
Bump Test Reading:	4.03	7.01	2584	0.00	235.1
Bump Test Temperature:	22.0	21.8	22.0	21.8	22.2

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

EC would not cal within range. Device keep turning off.

Approval and Distribution

☑ Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

[redacted]

Fieldwork Staff Signature

19.10.22

Date

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	OMP WBTA	**Project Number:**	60612563
Project Location:	Wide Bay	**Client:**	Defence
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:	Kennards
Make and Model:	YSI Pro Series
Serial Number:	20D101954

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	20.10.22 06:05				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	~~ppm~~ mg/L	~~ppm~~ ORP
Calibration Standard Concentration:	4.00	7.00	2602	0	235.6
Calibration Reading:	4.09	7.03	2578	0.00	234.8
Calibration Temperature:	21.5	21.4	~~22.0~~	21.5	21.7

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:					
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	~~ppm~~ mg/L	~~ppm~~ ORP
Calibration Standard Concentration:	4.00	7.00	2602	0	235.6
Bump Test Reading:	4.03	7.03	2580	0.00	234.8
Bump Test Temperature:	21.6	21.5	21.9	21.7	21.8

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

Approval and Distribution

☑ Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

[redacted] re

20.10.22
Date

Distribution: Project Central File

ANZ

FQM - Water Quality Meter Calibration Record

Q4AN(EV)-410-FM1

Project Name:	OMP WBTA	**Project Number:**	60612563
Project Location:	Wide Bay	**Client:**	Defence
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:	Kennards
Make and Model:	YSI Pro Series
Serial Number:	20D101954

CALIBRATION

CALIBRATE WITH CALIBRATION SOLUTIONS

Date and Time:	21.10.22 07:45				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	~~ppm~~ mg/L	~~ppm~~ ORP
Calibration Standard Concentration:	4.00	7.00	2707	0	233.4
Calibration Reading:	4.03	7.00	2681	0.00	230.2
Calibration Temperature:	23.4	23.4	23.5	23.5	23.4

ONGOING CHECKS

BUMP TEST WITH CALIBRATION SOLUTION

Date and Time:	21.10.22				
Parameter	Acidity		Conductivity	Dissolved Oxygen	
Units	pH	pH	µS/cm	~~ppm~~ mg/L	~~ppm~~ ORP
Calibration Standard Concentration:	4.00	7.00	2707	0	233.4
Bump Test Reading:	4.02	7.00	2686	0.00	231.4
Bump Test Temperature:	23.5	23.5	24.0	23.6	23.5

COMMENTS

Detail any equipment faults, minor maintenance performed, change of batteries or technical support provided.

Changed batteries, Had to restart cal

Approval and Distribution

☑ Each individual instrument has been inspected and calibrated daily and bump tested as required by fieldwork staff.

[redacted] — 21.10.22

[redacted] Date

Distribution: Project Central File

DRAFT

Appendix E

Sampling Analysis and Quality Plan

Prepared for
Department of Defence
ABN: 68 706 814 312

AECOM

PFAS OMP - WBTA Sampling and Analysis Quality Plan

26-Sep-2022
Doc No. 60612563_PL11_7_220926

aecom.com

Delivering a better world

PFAS OMP - WBTA Sampling and Analysis Quality Plan

Client: Department of Defence

ABN: 68 706 814 312

Prepared by

AECOM Australia Pty Ltd
Level 8, 540 Wickham Street, PO Box 1307, Fortitude Valley QLD 4006, Australia
T +61 7 3056 4800 www.aecom.com
ABN 20 093 846 925

26-Sep-2022

Job No.: 60612563

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

Quality Information

Document PFAS OMP - WBTA Sampling and Analysis Quality Plan

Ref 60612563

Date 26-Sep-2022

Prepared by [redacted]

Reviewed by [redacted]

Revision History

Rev	Revision Date	Details	Authorised	
			Name/Position	Signature
A	06-Oct-2020	Draft	[redacted]	
0	16-Oct-2020	Final		
1	19-Feb-2021	Final		
2	16-Mar-2021	Final		
3	23-Mar-2021	Final		
4	23-Apr-2021	Final		
5	03-Mar-2022	Final		
6	17-Mar-2023	Final		
7	26-Sep-2022	Final		[redacted]

Table of Contents

1.0 Introduction

1.1 Preamble

AECOM Australia Pty Ltd (AECOM) has prepared this Sampling and Analysis Quality Plan (SAQP) for the per- and poly-fluoroalkyl substances (PFAS) Ongoing Monitoring Plan at the **Wide Bay Training Area (WBTA)** (the 'site') and the **WBTA Management Area** in the **South Queensland Region**.

The SAQP supports the *PFAS Ongoing Monitoring Plan (OMP) – Wide Bay Training Area* which was included in the WBTA PFAS Management Area Plan (PMAP) (Defence, 2020), and here-in referred to as the OMP.

The purpose of the OMP program is to collect data that will enable Defence to maintain an up-to-date understanding of the distribution, concentration, transport (migration pathways and flow) and transformation of PFAS at the site and wider WBTA Management Area. The data will assist in the timely identification of risks and inform Defence's approach to the management of PFAS, including updates and revisions to the PMAP. The WBTA Management Area is presented on **Figure 1**, **Appendix A**.

1.2 SAQP Objectives

The objectives of this SAQP are to:

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

1.3 Scope of Works

To meet the project objectives, the following scope of work is proposed as per the OMP (Defence, 2020):

- Biannual sampling events in approximately October 2020[1], May 2021, November 2021, May 2022, October/November 2022, April/May 2023 October/November 2023, April/May 2024 including:
  - groundwater sampling of 17 on-site groundwater monitoring wells and five off-site groundwater monitoring wells
  - surface water sampling at 15 on-site and five off-site sampling locations
  - Tap sampling of the two on-site extraction bores
  - Tap sampling of the treated wastewater from the outlet tap of the Camp Kerr wastewater treatment plant (WWTP)
- Sediment samples (co-located with the surface water samples) will be collected once per year in April 2021, May 2022, April/May 2023 and April/May 2024
- Up to two event-based sampling of the WWTP during times of high site usage
- Preparation of reports including a sampling event factual report (following each sampling event) and an annual interpretative report following the completion of each 12-month sampling period.

[1] The October 2020, May 2021 and November 2021 sampling events are reported in AECOM (2021a), AECOM (2021b) and AECOM (2022).

1.4 Guidelines and Legislation

The SAQP has been developed with reference to the following guidelines and legislation:

- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2018) at https://www.waterquality.gov.au/anz-guidelines/guideline-values/default.
- Australian Government, 2019. *National Health and Medical Research Council (2019), Guidance on Per- and Poly-fluoroalkyl Substances (PFAS) in Recreational Water, 2019.*
- Department of Defence, *Routine Environment Water Quality Monitoring Manual*, 2016.
- Department of Defence, *Contamination Management Manual*, 2018 amended 2021.
- Department of Health, *Health Based Guidance Values for PFAS for use in site investigations in Australia*, 2019.
- Department of Environment and Science, *Environmental Protection Act 1994.*
- Environmental Protection Policy, (Water and Wetland Biodiversity), 2019.
- PFAS National Environmental Management Plan (NEMP), *Heads of Environmental Protection Agencies (HEPA)*, Version 2.0 2020
- FSANZ, 2017, *Perfluorinated chemicals in food. Food Standards Australia New Zealand and associated supporting documents,* 2017.
- National Environment Protection Council, 1999. *National Environment Protection (Assessment of Site Contamination) Measure* 1999, as amended 2013.
- National Health and Medical Research Council (NHMRC), *Guidance on PFAS in Recreational Water.* August 2019.
- Standards Australia 1998. AS/NZ 5667:1998 Water Quality – Sampling.
- US EPA, 2002. *Guidance on Environmental Data Verification and Data Validation*, November 2002.
- US EPA, 2006. *Guidance on Systematic Planning Using the Data Quality Objectives Process (EPA QA/G-4: EPA/240/B-06/001), February 2006*.

2.0 Site Identification and Conceptual Site Model

2.1 The Base and Management Area

The Preliminary Site Investigation (PSI) (AECOM, 2019) reported that the site was likely to have been in use by Defence since 1958. Prior to 1958, the site is likely to have been used for logging. Development of the site did not occur until circa 1965 when the airstrip and a small building were constructed in the southern portion of the site.

WBTA covers approximately 19,100 hectares (ha) of remnant bush and coastal to sub-coastal wetland. The site comprises 16 Training Area sectors including an approximately 20 ha cantonment at Camp Kerr in the southern portion of the site. Infrastructure within Camp Kerr includes a vehicle wash point, a refuelling area, accommodation and associated amenities, administrative facilities, a water treatment plant (WTP) and a WWTP. The remainder of the site comprises remnant bush and wetlands and is principally used to conduct combat team training, live firing activities and unmanned aerial vehicle (UAV) training. Infrastructure associated with the training areas include several firing ranges, training facilities, an ammunition storage compound, a road base quarry, a UAV airstrip and a disused airfield, (refer to **Figure 1, Appendix A**).

The Management Area is located on Tin Can Bay Road, Tin Can Bay, Queensland, 4580, approximately 50 km southeast of Maryborough and 175 km north of the Brisbane central business district (CBD), Queensland. The Management Area comprises WBTA and the small residential area of Wallu located adjacent to the southwestern corner of the Base. The Management Area is bordered by Toolara State Forest to the west and south, the Great Sandy Strait to the east, and the township of Tin Can Bay to the southwest, refer to **Figure 1**, **Appendix A**.

The small residential area of Wallu has approximately 34 properties and 110 residents. Some of the properties have dams. Bore water is used at individual properties for different purposes including household and outdoor purposes, topping up swimming pools, dam storage, crop irrigation, washing livestock. The Detailed Site Investigation (DSI) (AECOM, 2020) reported that dam water in some individual properties is used for recreational purposes and irrigating crops or watering livestock.

2.2 Conceptual Site Model

The conceptual site model (CSM) for the site is presented in detail in the OMP (Defence, 2020) which summarises the linkages between sources, pathways and receptors.

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 1 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

There is limited temporal and spatial data available to evaluate if PFAS in groundwater, surface water and sediment is increasing, stable or decreasing. More information is required on the impact of seasonality on PFAS concentrations in these media. Data are also required to demonstrate that at locations where PFAS has not been detected, this remains unchanged over time and at different times of the year.

Defence and State agencies require up-to-date data to enable informed risk management decisions to protect human health and the environment, given that elevated concentrations of PFAS have been identified in environmental media.

The data collected by this SAQP will provide a detailed dataset that can be used to assist with assessment of temporal changes in PFAS concentrations in groundwater and surface water / sediment on- and off-site. This will facilitate refinement of the CSM, allow update of the human health and ecological risk assessments and inform management decisions by Defence and government agencies.

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 / sediment and wastewater sampling and analysis program to provide current and ongoing information on the distribution and migration of PFAS contaminants of potential concern in groundwater and surface water / sediment 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 sediment 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 whether monitoring can be incorporated into existing Defence monitoring programs.

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 and investigation (groundwater levels and flow direction) results from previous investigations
- meteorological data including rainfall
- quantitative site characterisation data including visual observations and field measurements made during the monitoring program (sediment, groundwater and surface water), analytical data comparisons with screening criteria appropriate for the land use
- groundwater, surface water, sediment and wastewater data collected and analysed for PFAS, as part of the SAQP
- hydrogeological and hydrological data across the Management Area including gradient and flow direction
- statistical analysis to identify trends
- advances in laboratory analytical approaches and changes in regulatory requirements
- sampling event factual reports (e.g. AECOM, 2021).

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 lateral extent of the study area defined for decision making in this OMP is the Management Area as outlined in **Figure 1**, **Appendix A**). The vertical extent of the investigation will be the depth of the water supply bores (Bore 1 and Bore 2) at the Base (78.5 m below ground level).
- The sampling completed as part of the SAQP includes groundwater, surface water, sediment and wastewater at the frequencies defined in **Section 4.3**.
- The monitoring will be long term and potentially ongoing.

The SAQP will also cover the primary implementation period of the OMP (Defence, 2020). The SAQP will also cover the extended implementation period to the extent required by specific characteristics of the site and surrounds, and behaviour of PFAS in groundwater, measured against specified data trends.

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.
- Analytical method selection for PFAS is based on achieving appropriate laboratory limits 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 is reported at a concentration that is above drinking water guideline in groundwater, then it will be considered that further assessment is required and / or notification.
- If the PFAS is reported at a concentration that is inside a trigger value or acceptable range, then it will be considered whether monitoring is continued or reduced, this assessment will be undertaken after two years of monitoring.

The decision on the acceptance of the analytical data will 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 (Defence, 2020) 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, the OMP outlines minimum numbers of samples proposed to be collected from each media.
- As such, there may be limitations in the data if aspects of the OMP cannot be implemented. Some examples of this scenario include but are not limited to:
    - Proposed surface water sample locations may be dry at the time of sampling
    - Proposed groundwater well locations are damaged or destroyed and therefore cannot be sampled
    - Proposed samples are not collected due to access being restricted to a given location.
- Limitations in ability to acquire useful and representative information from the data collected. The data are proposed to be collected from multiple locations and sample media.
- 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 described in **Section 1.2** 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 NEMP, Defence and Australian Standards. These standards are as follows:
  - Department of Defence (July 2018, Amended August 2019), *Contamination Management Manual.*
  - National Environment Protection Council, 1999. *National Environment Protection (Assessment of Site Contamination) Measure* 1999, as amended 2013.
  - 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.*
- 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 period 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
- 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 2**.

Table 2 Acceptance Criteria for Data Quality Indicators for Sample Analysis

Data Quality Indicators	Acceptance Criteria
Water and Sediment Samples	
Rinsates (where sampling equipment is reused)	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 particular analyte / analytical suite.

4.0 Sampling Location Rationale and Methodology

4.1 OMP

The OMP (Defence, 2020) presents an overview of specific monitoring works to be undertaken and provides the basis for the preparation of this SAQP. The scope of work presented in this SAQP is consistent with that detailed in the OMP (Defence, 2020).

4.2 Proposed Schedule

4.2.1 Sampling Events

Groundwater, surface water, sediment and wastewater sampling from across the Management Area will be performed biannually as part of a post-wet season sampling event in April/May and a post-dry season sampling event in October/November. The proposed schedule of fieldworks is presented in **Table 3** below.

Table 3 Proposed Fieldwork Schedule

Sampling Round No.	Description of works	Proposed Schedule
1	Post-dry season groundwater, surface water, sediment and wastewater sampling	October 2020
2	Post-wet season groundwater, surface water and wastewater sampling	May 2021
3	Post-dry season groundwater, surface water, sediment and wastewater sampling	November 2021
4	Post-wet season groundwater, surface water and wastewater sampling	May 2022
5	Post-dry season groundwater, surface water, sediment and wastewater sampling	October/November 2022
6	Post-wet season groundwater, surface water and wastewater sampling	April/May 2023
7	Post-dry season groundwater, surface water, sediment and wastewater sampling	October/November 2023
8	Post-wet season groundwater, surface water and wastewater sampling	April/May 2024

4.3 Sample Location Rationale

4.3.1 Groundwater Sampling Locations

Groundwater monitoring will be undertaken on selected monitoring wells. The rationale for monitoring well selection for each area is summarised in **Table 4** below.

It is noted that the OMP (Defence, 2020) does not propose to sample private residential bores in Wallu as groundwater at these locations have been characterised as part of the DSI (AECOM, 2020). Groundwater monitoring will include wells MW116 and MW117, positioned between Camp Kerr and Wallu, which will allow identification of PFAS migrating from the base towards Wallu.

Access permissions will be required for the sampling of off-Site monitoring locations on Council and DTMR land. A stakeholder engagement plan may need to be prepared to manage this process.

Table 4 Groundwater Monitoring Locations and rationale

Well ID	Location	Rationale
MW101	POL refuelling point	To characterise groundwater quality down-gradient of the refuelling point where aqueous film forming foam (AFFF) containing PFAS may have been used historically. Resampling of this well, which was installed in 2018.
MW102	POL refuelling point	To characterise groundwater quality down-gradient of refuelling point where AFFF may have been used historically. Resampling of this well, which was installed in 2018.
MW103	To the southeast of the airstrip	To characterise groundwater quality cross-gradient of the south eastern airfield. Resampling of this well, which was installed in 2018.
MW104	To the northeast of the airstrip	To characterise groundwater quality down-gradient of the south eastern airfield. Resampling of this well, which was installed in 2018.
MW105	To the west of the airstrip	To characterise groundwater quality up-gradient of the south eastern airfield. Resampling of this well, which was installed in 2018.
MW106	Along southern Site boundary	To characterise groundwater quality adjacent to the southern Site boundary close to an off-site landfill. Resampling of this well, which was installed in 2018.
MW107	Near the 600m range / Electronic Classification Range	To characterise groundwater quality up gradient of the former on-Site landfill and downgradient of the 600m Range. Resampling of this well, which was installed in 2018.
MW108	At the scrape (Landfill 1)	To characterise groundwater quality down gradient of a former landfill and downgradient of the 600m range. Resampling of this well, which was installed in 2018.
MW109	Close to eastern site boundary	To characterise groundwater quality down-gradient of the MUFP close to the eastern Site boundary. Resampling of this well, which was installed in 2018.
MW110	MUFP (multiuser firing point) Range	To characterise groundwater quality downgradient of the MUFP. Resampling of this well, which was installed in 2018.
MW111	North west of Camp Kerr	To characterise groundwater in an area potentially historically used for AFFF demonstration. Resampling of this well, which was installed in 2018.
MW112	East of the caretaker's residence	To characterise the lateral extent of PFAS in the area of the caretaker's residence. Resampling of wells installed in 2019.
MW113 (Off-site)	South of the caretaker's residence (Department of Transport and Main Roads land)	
MW114 (Off-site)	Southwest of the caretaker's residence (Department of Transport and Main Roads land)	

Well ID	Location	Rationale
MW115	West of the POL, southwest of the WTP	To characterise the lateral extent of PFAS in the area of the POL/WTP and potential risk to groundwater users in Wallu. Resampling of wells installed in 2019.
MW116 (Off-site)	West of Camp Kerr (Council land)	
MW117 (Off-site)	West of Camp Kerr (Council land)	
MW118 (Off-site)	South of Camp Kerr (DTMR land)	To characterise the lateral extent of PFAS in the area of the caretaker's residence and potential risk to groundwater users in Wallu. Resampling of the well, which was installed in 2019.
MW119	Central portion of Camp Kerr	To provide information on groundwater flow directions and PFAS concentrations in the central portion of Camp Kerr. Resampling of the well, which was installed in 2019.
MW120	West of WWTP	To characterise groundwater to the east of the wastewater treatment plant. Resampling of this well, which has been sampled in monitoring events conducted since 2017.
MW121	Southwest of the caretaker's residence	To characterise groundwater in the area of the caretaker's residence. Resampling of these wells which have recorded PFAS in monitoring events conducted since 2017.
MW122	Southwest of the caretaker's residence	
POT001	WTP- tap outlet prior to treatment	These are abstraction bores in the WTP, which are 78.4 m (Bore 1) and 51.5 m deep (Bore 2). The purpose of the monitoring is to understand PFAS concentrations in the deeper part of the aquifer.
POT005	WTP- tap outlet prior to treatment	

Note: Off-site sampling locations will require the agreement of the landholder/leaseholder.

4.3.2 Wastewater monitoring

A sample of the treated wastewater will be collected from the outlet tap of the Camp Kerr WWTP twice a year, in April and October. The sample location and rationale is set out in **Table 5** below.

Table 5 Groundwater monitoring locations and rationale

Sample ID	Location	Rationale
OTH001	Wastewater treatment plant	The purpose of the sampling is to monitor PFAS concentrations in the effluent that is irrigated to ground at three locations in Camp Kerr.

Up to two event-based sampling events will be conducted at the WWTP (OTH001) at times of high site usage during the three-year implementation period. The timing of the event-based sampling will be in response to the Base advising of increase in personnel, such as for a training exercise.

4.3.3 Surface Water and Sediment Sampling Locations

The proposed 19[2] surface water and sediment monitoring locations are set out in **Table 6** below and on **Figure 2** and **Figure 3**, **Appendix A**. Sampling of surface water locations is proposed twice a year, in April and October. Sampling of sediment is proposed to occur once a year in April only.

[2] Twenty sampling locations were proposed in the SAQP (AECOM, 2020), however, one of the locations, SW020/SD020 has not been accessible due to the stakeholder not providing permission and this location has been removed from the OMP.

Water may not be consistently present at sample locations SW017, SW018, SW019, SW025 and SW027, therefore, sampling of these locations should be timed to occur following rain events.

Table 6 Surface Water and Sediment Sampling Locations and Rationale

Sample ID	On/Off-site	Location	Rationale
SD/SW004	On-site	Kauri Creek	Characterisation along Kauri Creek.
SD/SW008	On-site	Kauri Creek	
SD/SW012	On-site	Near boat ramp and sentry post	
SD/SW005	On-site	Mosquito Creek	Characterisation along Mosquito Creek.
SD/SW006	On-site	Tributary of Kangaroo Creek	Characterisation along Kangaroo Creek.
SD/SW007	On-site	Upper part of Kangaroo Creek	
SD/SW009	On-site	Central section Kangaroo Creek	
SD/SW013	On-site	Snapper Creek, downstream of MUFP and airstrip	Characterisation along Snapper Creek.
SD/SW014	On-site	Tributary of Snapper Creek	
SD/SW016	On-site	Tributary of Snapper Creek	
SD/SW017	On-site	Unlined channel to south of the caretaker's residence	Characterisation of surface water in drainage feature which received runoff from the irrigation of treated effluent containing PFAS.
SD/SW018	On-site	Vehicle washpoint drainage channel	Characterisation along unlined drainage channel downstream of vehicle wash point to characterise the potential for PFAS concentrations.
SD/SW019	On-site	Ponded water from surface water flows	Sampling of area of ponded water on the western site boundary to inform potential for PFAS to be present in surface water flowing overland from the Camp Kerr area.
SD/SW021*	Off-site	Residential dams in Wallu	PFAS was detected in residential dams in Wallu in the DSI. Sampling will provide temporal data.
SD/SW022*	Off-site		
SD/SW023*	Off-site		
SD/SW024*	Off-site		
SD/SW025	Off-site	Ephemeral waterway	Resampling of an ephemeral waterway that drains the residential dams in Wallu.
SD/SW027	Off-site	Drainage pipe at Clyde Road	Sampling at the point where overland water discharges from the western portion of Camp Kerr into residential dams. Not previously sampled.

Note: * Location is on a private residential property and will require the agreement of the landholder / leaseholder

4.4 Sample Collection and Handling

4.4.1 Groundwater Sampling

The groundwater sampling methodology and schedule are presented in **Table 7**.

Table 7 Groundwater Sampling Methodology and Schedule

Item	Details
Groundwater gauging	The depth to groundwater will be measured in each monitoring well immediately prior to collection of groundwater samples. Groundwater gauging will be conducted in as short a period as possible, noting there may be access restrictions during the fieldworks due to operational activities at the Base. The gauging event will include all monitoring wells listed in **Table 4** and shown on **Figure 2 and Figure 3** in **Appendix A** to enable a groundwater contour map to be prepared and groundwater flow directions to be inferred. Groundwater gauging will consider environmental variables including tidal influence at the Base.
Sample Collection Methodology	**Groundwater Monitoring Wells** Groundwater samples will be collected from all monitoring wells using no-purge methodology HydraSleeves™, which will be installed within the screened interval of the wells (approximately 1 m above the base of the well) for a minimum of 24 hours prior to the sampling round. Monitoring well construction details are presented in **Appendix B**. Once sampling is completed, new HydraSleeves™ will be deployed at the screened interval depth in preparation for the next sampling round. **Abstraction Bores** The tap/valve will be opened, and water allowed to run prior to a sample being collected. Water samples will be collected by placing the laboratory provided sample bottle beneath the tap outlet.
QA/QC Samples to be Collected	Field QA/QC samples are to include intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits) and equipment rinsate blank (rinsate) samples. Duplicate samples are to be collected at a minimum frequency of 1 in 10 primary samples. Rinsate samples are to be collected at a rate of one sample per fieldwork day by pouring laboratory supplied PFAS-free deionised water over the decontaminated sampling equipment. QA/QC samples will be targeted at locations where PFAS is expected to be detected (MW118, MW121 and MW122).
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 using the standard levels of detection.
Sampling Schedule	The monitoring at WBTA will include two biannual monitoring events of all monitoring wells specified in **Section 4.3.1** in April and October. These months are busy periods for the Range as training exercises (live firing) frequently occur at the Range at these times restricting access. Sampling events will be scheduled around the training. This may result in the sampling events being conducted in May and November.

4.4.2 Surface Water Sampling

The surface water sampling methodology and schedule is presented in **Table 8**.

Table 8 Surface Water Sampling Methodology and Schedule

Item	Details
Sample Collection Methodology	Samples to be collected from immediately below the water surface 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 with the cap immediately applied once the container is full.
Sample Location Observations	Descriptions on the sample location characteristics (drain / stream width, water height, flow direction and strength of flow) will be recorded.
QA/QC Samples to be Collected	Field QA/QC samples are to include intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits) and equipment rinsate blank (rinsate) samples. Duplicate samples are to be collected at a minimum frequency of 1 in 10 primary samples. Rinsate samples are to be collected at a rate of one sample per fieldwork day by pouring laboratory supplied PFAS-free deionised water over the decontaminated sampling equipment. QA/QC samples will be targeted at locations where PFAS is expected to be detected (i.e. SW06, SW014, SW027).
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 extended suite using the trace levels of detection.
Sampling Schedule	The monitoring at WBTA will include two biannual monitoring events, in April and October. These months are busy periods for the Range as training exercises (live firing) frequently occur at the Range at these times restricting access. Sampling events will be scheduled around the training. This may result in the sampling events being conducted in May and November.

4.4.3 Sediment Sampling

The surface water sampling methodology and schedule are outlined in **Table 9**.

Table 9 Sediment Sampling Methodology and Schedule

Item	Details
Sample Collection Methodology	Samples representative of potentially deposited sediments to be collected from within the water body if possible. Sediment samples will be collected using a trenching shovel from the base of the drain (where possible) or edge of the dam, or using a Dormer Piston Sediment Sampler. At each location, a new laboratory supplied container should be used for each sample.
Sample Location Observations	Descriptions on the sample location characteristics (drain / stream width, water height, flow direction and strength of flow) will be recorded.
QA/QC Samples to be Collected	Field QA/QC samples are to include intra-laboratory duplicate and inter-laboratory duplicate samples (i.e. splits) and equipment rinsate blank (rinsate) samples. Duplicate samples are to be collected at a minimum frequency of 1 in 10 primary samples. Rinsate samples are to be collected at a rate of one sample per fieldwork day by pouring laboratory supplied PFAS free deionised water over the decontaminated sampling equipment.
Sample Analysis	All primary samples will be submitted for PFAS extended suite using the standard levels of detection.
Sampling Schedule	The sediment sampling will be conducted annually as part of the post-wet season event (April).

4.4.4 Biota Sampling

Biota sampling is not included in the OMP (Defence, 2020). However, ad hoc biota samples may be collected at the request of Defence in accordance with the sampling methodology presented in **Table 10**.

Table 10 Biota Sampling Methodology and Schedule

Item	Details
Sample Collection Methodology	Targeting sampling of biota (e.g. aquatic biota such as fish, crayfish) may need to be conducted on an ad hoc basis. Appropriate sampling techniques will be used to collect the samples; for example, gill nets or electro fishing will be used to collect fish, sample traps could be used to collect crayfish. Where required, samples will be collected by a qualified contractor holding a general fisheries permit for the collection of tissue samples. Where required to obtain sufficient sample mass for laboratory analysis, multiple specimens of the same species may need to be composited. Sampling of fish for human health assessment will require targeting of fish of consumptive size. Samples will be identified, measured, weighed, photographed and placed in a zip lock bag following euthanasia in ice slurry.
QA/QC Samples to be Collected	No QA/QC samples will be collected.
Sample Analysis	All primary samples will be submitted for PFAS extended suite using the standard levels of detection for biota samples.
Sampling Schedule	Samples will be collected on an ad hoc basis at the request of Defence.

4.4.5 Sample Handling and Transport to Laboratory

AECOM personnel will attempt to reduce potential heterogeneity in the sample media matrix by dividing the sample collected between primary and intra-laboratory jars or bottles during sampling. All samples will be placed on ice in eskies immediately after sampling.

All samples will be kept, if possible, at or below 4°C during transit to the laboratory. Prior to sampling, assessment of the analytical holding times will be made and the sampling planned accordingly to help ensure that holding times are not breached or is minimised.

Samples will be transported to the laboratory for analytical testing under standard Chain of Custody documentation. Primary and associated duplicate QA/QC samples will be analysed by ALS Brisbane. The inter-laboratory duplicate samples will be analysed by the National Measurement Institute (NMI).

4.5 Calibration

The water quality meter will be calibrated each day prior to the commencement of 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 field sheets and included in the Sampling Events Factual Reports.

4.6 Logistics

The laboratory sample containers will be collected from the laboratory prior to the commencement of fieldwork. All samples will be transported by an ALS by the field team or a supplied courier at the completion of fieldwork. All inter-laboratory duplicate samples will be couriered from ALS to the secondary laboratory under a separate CoC documentation for analysis.

4.7 Analytical Suite and Laboratory Analysis Methods

4.7.1 Laboratory NATA Accreditation Details

The laboratory is required to use NATA accredited methods based on NEPM, US EPA, Table B 15 of the US Department of Defence/Department of Energy (US DOD/DoE) and American Society for Testing and Materials (ASTM) methods as appropriate.

The primary and secondary laboratories selected for this program are ALS (NATA Accreditation Number 825) and NMI (NATA Accreditation Number 198), respectively.

4.7.2 Analytical Schedule

All media sampled shall be analysed for the extended PFAS suite as outlined in **Table 11** below.

Table 11 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
	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 12** below.

Table 12 Laboratory Limits of Reporting

Sample Media	Parameter	Technique/Method Reference	LOR*
Groundwater and Surface Water	Standard PFAS Suite (groundwater samples)	LC/MS-MS	0.002 – 0.1 µg/L
	Trace level PFAS Suite (surface water samples)	LC/MS-MS	0.0005 to 0.002 µg/L
Sediment	Standard PFAS Suite	LC/MS-MS	0.0002 – 0.001 mg/kg

LC/MS-MS = Liquid chromatography–mass spectrometry, GC = Gas chromatography

*LOR for Australian Laboratory Services (ALS)

4.8 Sample Nomenclature

In order to meet Defence data management requirements, a consistent sample nomenclature has been adopted for the Program. All primary samples will be labelled using the following Defence Contamination Management Manual (DCCM) naming convention:

PPPP_XX000 _YYMMDD

[property ID]_[type of sample][THREE DIGIT sample number]_[yearmonthday]

e.g. 0224_MW101_201001

Location types and codes are prescribed by Defence and the Site's investigation history.

Primary Sample Types/Location Codes relevant to this OMP include:

- SD = sediment – top depth required
- MW = monitoring well
- SW = surface water - no depth required

QAQC Samples will be labelled in accordance with the following convention:

- Duplicate: PPPP_QC1XX_YYMMDD
- Triplicate: PPPP_QC2XX_YYMMDD
- Rinsate: PPPP_QC3XX_YYMMDD

4.9 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 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.

4.10 Adopted Screening Criteria

Adopted screening criteria references national guidance in the form of the PFAS National Environmental Management Plan, Defence estate and environmental strategies, and Defence PFAS-specific strategies and guidance.

At the time of preparing this SAQP, a number of guidance documents were in circulation in Australia including:

- PFAS National Environmental Management Plan (NEMP), Version 2.0, (HEPA 2020)
- Department of Health, 2019. Health Based Guidance Values for PFAS for use in site investigations in Australia
- 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 PFAS screening criteria to assess the data generated as part of the OMP are presented in **Table 13** below.

Groundwater will be screened against drinking water guidelines. Surface water in creeks and dams will be screened against recreational water and ecological guidelines.

There are no HEPA (2020) endorsed guideline values available for PFAS in sediment.

Table 13 Summary of Adopted Screening Criteria

Pathway	Compound	Criteria	Comment / Reference
Human Health Receptors			
Drinking water - groundwater	PFOS + PFHxS	0.07 µg/L	The values presented in the PFAS NEMP, 2020 are from DoH 2019, 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 2019 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	In August 2019, NHMRC released guidance on the assessment of PFAS in surface water. 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	
Ecological Receptors			
Freshwater (99% species protection values)	PFOS	0.00023 µg/L	The values are from the PFAS NEMP, 2020 which endorsed the Australian and New Zealand Guidelines for Fresh and Marine Water Quality – draft default guideline values. AECOM understands that these guidelines are currently being reviewed and will consider the appropriateness of considering any future revision. The 99% level of protection has been applied for high conservation 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 (except SW025) and groundwater results will be compared to these criteria.*
	PFOA	19 µg/L	
Freshwater (95% species protection values)	PFOS	0.13 µg/L	Surface water in the ephemeral waterway south of Clyde Road (SW025) should be screened against freshwater ecological guidelines for slight to moderately disturbed ecosystems (95% species protection).
	PFOA	220 µg/L	

4.11 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.

Wastewater generated will be provided to the on-site groundwater treatment plant for disposal.

All consumables (i.e. HydraSleeves^{TM}, filter cartridges, general rubbish) will be bagged and placed in on-site general waste bins for disposal.

4.12 Quality Assurance/Quality Control Sampling

4.12.1 Field Duplicate and Inter-laboratory Duplicate Samples

Field duplicate (intra-laboratory) duplicate samples and split (inter-laboratory field duplicates) are to be collected and analysed at a minimum frequency of 1 in 10 primary samples.

4.12.2 Rinsate Samples

Rinsate samples are to be collected at a rate of one sample per fieldwork day or at least one rinsate sample per ten primary samples (whichever rate is lower) by pouring laboratory supplied deionised water over the decontaminated sampling equipment.

4.13 Fieldwork Documentation

4.13.1 Field Notes

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. The date and time of the Hydrasleeve installation and sampling will be recorded;
- Surface water samples – comments on the observed characteristics of the sample (e.g. colour, turbidity, odour, sheen), field water quality parameters (pH, EC, DO, ORP, temperature) and sample location characteristics (drain / stream width, water height, flow direction and strength of flow) will be recorded; and
- Sediment samples - comments on the morphology of the sample location, the depth, flow direction and strength of water flow (if water is present), the water and sediment/soil colour and odour, and the presence of flora and fauna. The soil/sediment types observed at each sample location will be described using the Unified Soil Classification System (USCS).

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 data capture (‘EDCA’) system will be utilized by field staff to minimise potential data recording errors and allow on-the-spot identification of potentially erroneous data in comparison to historical data.

4.13.2 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
- 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 ALS 'Compass' sample management application to streamline sample labelling and chain of custody (CoC) creation to ensure compliant sample IDs are used in the field.

4.13.3 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
- 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.

4.13.4 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
- Calibration records.

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

4.14 Reporting

4.14.1 Sampling Event Factual Report

No later than four weeks following receipt of the laboratory reports, AECOM will prepare and submit a Sampling Event Factual Report to Defence in accordance with Defence OMP Factual Report Guidance (Defence 2021a). 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 sampling forms including field water quality parameter measurements;
        i. Chain of custody forms;
        ii. Laboratory analytical certificates; and
        iii. Equipment calibration certificates.

4.14.2 Annual Interpretive Report

At the end of each 12-month monitoring period following the April monitoring event, AECOM will prepare and submit an Annual Interpretive Report to Defence in accordance with Defence OMP Interpretative Report guidance (Defence, 2021b). Each Interpretive Report will include:

- evidence of compliance with the requirements of the SAQP and meeting stated objectives of the OMP (Defence, 2020)
- 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 (Defence, 2020)
- assessment and commentary on appropriate QA/QC procedures
- a review of the CSM and provision of a revised CSM 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 (Defence, 2020)
- a statement as to whether the risk profile has changed overall, or for any specific location at the Site, and a recommendation as to whether this should trigger an OMP and/or PMAP review, or other action.

4.15 Deviations from OMP

A review of the SAQP was conducted prior to the implementation of the May 2021 sampling event.

- The OMP included analysis for a non-PFAS suite for approximately 20% of groundwater, surface water and sediment samples. The first OMP sampling event, completed in October 2020, included these analyses. Following a review of the SAQP, the collection and analysis of samples for non-PFAS analytes is not justified at the Base at this time to meet the requirements of the OMP and hence has been removed from the analytical schedule.

As sampling location SW020/SD020 has not been accessible for sampling in 2021, despite repeated attempts requesting access, this sampling location has been removed from the OMP.

Sampling events were planned to occur in April 2021, October 2021 and April 2022 but actually took place in May, 2021, November 2021 and May 2022, respectively. The sampling events were delayed due to training exercises, including live firing, occurring at the Range during April 2021, October 2021 and April 2022 which restricted access to portions of the Base.

Other than the above changes, the scope of works and methodology described in this SAQP are consistent with that presented in the OMP (Defence, 2020).

5.0 References

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Appendix A

Figures

Appendix A Figures

Wide Bay Training Area

Australian Government Department of Defence

Tin Can Bay

Inskip

Pannikin Island

Little Stony Creek

Teelah Creek

Griffin Creek

Carlo Island

Carlo Point

TOOLARA STATE FOREST

Maxwells Creek

Kauri Creek

Kangaroo Creek

Puddo Point

Tin Can Inlet

Snapper Point

Smooger Point

CARAVAN PARK

Tin Can Bay

TIN CAN BAY STATE SCHOOL

CARAVAN PARK

TOOLARA GOLF COURSE

Toolara

Tudd Point

TOOLARA AIRPORT

Teewah Point

North Cooloola Point

Marybrough - Cooloola Road

Tin Can Bay Road

CAMP KERR

Wallu

Wallu Heights

Rainbow Beach Road

Unnamed Creek

Snapper Creek

Cooloola Cove

South Cooloola Point

Poverty Point

KEY

- Wide Bay Training Area
- Management Area
- Parks and recreation reserves
- Major road
- Road
- Watercourse

0 2km

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MANAGEMENT AREA

Ongoing Monitoring Plan,

Wide Bay Training Area, Queensland

FIGURE 1

Pioneer Point Boat Ramp
Tin Can Bay
Inskip
Pannikin Island
UOTF/EHTA
Demolition Range
SW012
Old Boat Ramp/Sentry Post
Little Sandy Creek
Airstrip UAV
24m Tower
Wide Bay Training Area
SW005
SW008
Mosquito Creek
Tookar Creek
Griffin Creek
Forward Operating Base
SW009
Carlo Island
AGR/SGR/DFSW
SW004
Kauri Creek
Kingfisher Creek
Easy Feature/MUFP/MCR/BIF
Quarry
Tin Can Bay
Tin Can Bay Waste Transfer Station and Sewage Treatment Works
Ammunition Storage
MW110
MW109
SW013
SW014
Maryborough - Cooloola Road
MW107
MW108
SW06
Landfill 1
Range/ECR
SW07
MW104
MW105
MW103
SW016
Tin Can Bay Road
MW111
MW106
Area shown in Figure 3
Wallu
Wallu Heights
Rainbow Beach Road
Snapper Creek
Tuan Creek
Cooloola Cove
Toolara
Teewah Point
North Cooloola Point
South Cooloola Point
Poverty Point
Snapper Point
Smooger Point
Tin Can Inlet

KEY

- Wide Bay Training Area
- Management Area
- Great Sandy Strait Ramsar
- Parks and recreation reserves
- Major road
- Road
- Watercourse
- Surface water sample location
- Groundwater monitoring well location

0 2km

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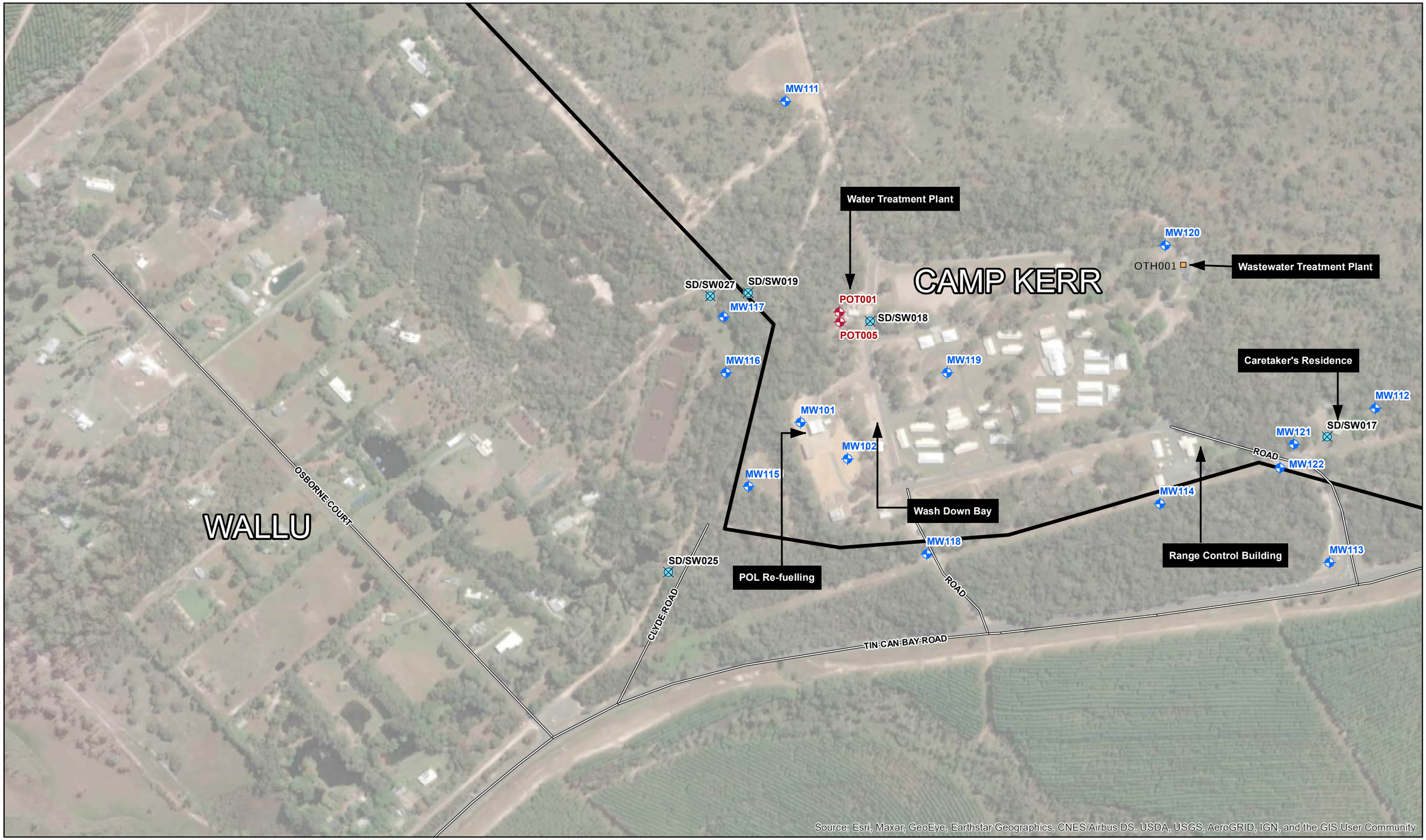
UOTF – Urban Operations Training Facility
AGR – Assault Grenade Range
SGR – Standard Grenade Range
MUFP - Multi User Firing point
MCR – Multi Classification Range
ECR – Electronic Classification Range
BIF – Battle Inoculation Facility

SAMPLING LOCATIONS (GREATER WIDE BAY TRAINING AREA)

Ongoing **M**onitoring **P**lan
Wide Bay Training Area, Queensland

FIGURE F2



AECOM

N

DATUM GDA 1994, PROJECTION MGA ZONE XX

0 55 110 220

metres

1:4,500 (when printed at A3)

LEGEND

- Abstraction Bore
- Groundwater sampling location
- Sediment / surface water sampling location
- Road
- Wide Bay Training Area
- Wastewater Treatment Plant sampling location

Notes:

1. Surface water samples SW021 to SW024 are located on residential properties and are not displayed on this figure.
2. Sample OTH001 is collected from the tap outlet of the Wastewater Treatment Plant.
3. POT001 and POT005 are collected from tap outlets at these bores.

Data sources:

Base Data: (c) 20XX (data source) (additional data)

SAMPLING LOCATIONS (CAMP KERR)
Ongoing Monitoring Program
Wide Bay Training Area, Queensland
Camp Kerr and Wallu

PROJECT ID	60612563
CREATED BY	ScottA3
LAST MODIFIED	cmccosker - 01/09/2020
VERSION:	1

Figure 3

Filename:P:\605X\60580555\4. Tech Work Area\4.99 GIS\02_MXDs\20200602_JPeachey_WBTA\60580555_F3_OMP_Sampling_Locations_CampKerr_20200602.mxd

A3 size

Appendix B

Monitoring Well Construction Details

Appendix B Monitoring Well Construction Details

Well ID	Easting	Northing	Relative Elevation of Top of Casing (mAHD)	Constructed Total Bore Depth (mbgl)	Depth of Screened Interval (mbtoc)	Targeted depth for Hydrasleeve (mbtoc)
MW101	491110.98	7129853.54	79.264	15.0	11.0 - 15.0	14.0
MW102	491164.14	7129808.09	78.564	20.0	14.0 - 20.0	19.0
MW103	496663.71	7131232.71	33.239	10.5	7.5 - 10.5	9.5
MW104	497121.86	7131937.54	20.815	11.0	8.0 - 11.0	10.0
MW105	496293.82	7131574.71	27.603	7.2	4.2 - 7.2	6.5
MW106	492729.31	7130284.43	69.468	10.0	4.0 - 10.0	9.0
MW107	492450.19	7131631.52	37.789	5.8	2.8 - 5.8	4.8
MW108	492639.22	7131306.77	39.99	17.5	14.5 - 17.5	16.5
MW109	497399.00	7133007.94	9.207	10.0	7.0 - 10.0	9.0
MW110	496044.47	7132934.25	17.967	4.0	0.5 - 4.0	3.0
MW111	491093.50	7130255.87	78.952	20.5	16.5 - 20.5	19.5
MW112	491760.84	7129872.04	65.183	9.0	6.0 - 9.0	8.0
MW113	491709.10	7129678.45	67.717	9.0	6.0 - 9.0	8.0
MW114	491517.49	7129752.02	73.016	14.5	8.5 - 11.5	10.5
MW115	491051.90	7129773.34	76.659	16.0	13.0 - 16.0	15.0
MW116	491026.40	7129915.59	69.815	11.0	8.0 -11.0	10.0
MW117	491023.74	7129985.77	68.914	10.0	7.0 - 10.0	9.0
MW118	491253.67	7129688.89	76.154	13.0	10.0 -13.0	12.0
MW119	491276.52	7129916.21	79.546	16.0	13.0 - 16.0	15.0
MW120 (MB1.1)	491523.05	7130075.59	71.332	Unknown	Unknown	12.5
MW121 (MB2.1)	491668.54	7129826.51	70.405	Unknown	Unknown	14.0
MW122 (MB3.1)	491653.19	7129797.48	70.575	Unknown	Unknown	19.0

Notes:

mbgl - metres below ground level

mbtoc - metres below top of casing

mAHD - metres above Australian Height Datum