MFS Peterborough Station

Detailed Site Investigation

South Australian Metropolitan Fire Service

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→ The Power of Commitment



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Executive Summary

Background

GHD Pty Ltd (GHD) was engaged by the South Australian (SA) Metropolitan Fire Service (MFS) to undertake a Detailed Site Investigation (DSI) of the MFS Peterborough Station, located at 86 Main Street, Peterborough, South Australia 5422 (the site). The DSI is limited to the nature and extent of potential impacts from the use of aqueous film-forming foams (AFFF) containing per- and poly-fluoroalkyl substances (PFAS). Historically, the MFS has used AFFF containing PFAS at the site during training activities. Residual AFFF was also flushed from firefighting appliances on-site subsequent to emergency response incidents.

To assist the MFS in meeting the requirements prescribed by the SA EPA (GENI 62917), GHD completed a PSI for the MFS Peterborough Station in 2023 (GHD 2023a) which was subsequently used to inform the development of a preliminary conceptual site model (CSM) and design of an SAQP (GHD 2023b) for implantation as part of this DSI.

Objectives

The objective of this investigation is to address the SA EPA's requirement to undertake a DSI in order to assess:

– The nature and extent of PFAS contamination in soils and groundwater, both on- and off-site.
– The potential risks to human health and the environment associated with identified PFAS contamination on-site, in the context of continued commercial/industrial use.
– The potential risks to human health and the environment associated with PFAS contamination migrating off-site, in the context of the relevant off-site land uses and receiving environments.
– The potential requirement to undertake appropriate and sufficient consultation measures to ensure that the local community/relevant stakeholders are kept informed regarding the on-going investigations, the assessment results and any associated potential risks, proposed remediation/management measures and any potential limitations on the use of local groundwater/surface water.

Scope

The following scope of works was undertaken in general accordance with the SAQP (GHD 2023b):

– Advancement of five soil bores targeting the rear of the site where equipment washdown, flushing, training and AFFF (concentrate containing PFAS) storage is known to have occurred historically.
– Installation of three groundwater monitoring wells.
– Surveying of the newly installed groundwater monitoring wells relative to Australian Height Datum (AHD).
– Disposal of waste soil and groundwater by a licenced contractor.
– Development of a CSM, comprising an assessment of PFAS source areas, pathways and receptors.
– Preparation of this DSI.

Determination of Site Contamination

Based on the information presented in this DSI report, PFAS impacts have been identified in soil north-west of the station building and within the unpaved southern portion of the site, as well as in groundwater beneath the site. The highest soil impacts were observed in samples taken from the unpaved rear yard which formed part of the historical training and wash down area.

Conclusions

The following conclusions were drawn based on the findings of the investigation:

- PFAS impacts in soil at the site are most likely related to historical fire station activities, including training and storage of PFAS containing AFFF.
- Regarding reported soil results:
  - The highest reported concentrations of PFAS in soils have been identified within the southern portion of the site where the unpaved rear yard is situated.
  - No exceedances of the adopted human health investigation level (HIL B) or the MFS regional (retained) stations assessment criteria were reported during the investigation. The potential risks to human health for the current site use are considered low and acceptable.
  - A total of 20 soil samples were taken from the 12 sampling locations strategically distributed within the historical training site and wash down areas. Out of these, 11 samples have yielded concentrations exceeding the guideline values for indirect ecological exposure (developed sites) and 1 sample has yielded concentrations exceeding the guideline values for direct ecological exposure.
  - Higher concentrations of PFOS were recorded from samples collected from surface and near surface depths. The maximum depth at which PFOS concentrations were detected was approximately 4.5 meters.
  - Relatively higher PFOS concentrations exceeding the adopted ecological criteria were detected in samples BH05, BH06 and MW01, ranging from 0.51 to 0.81 mg/kg. These samples were collected from sampling locations strategically distributed in the middle portion of the unpaved rear yard and in the north-western portion of the rear yard near the historical PFAS storage area.
  - Delineation of the vertical extent and degree of PFAS impacts are subject to further investigation as deeper strata soil samples (up to 4.5 m bgl) and Q1 aquifer groundwater samples reported exceedances above the adopted assessment criteria.
  - A potential complete linkage in the source-pathway-receptor continuum for ecological exposure can be drawn as the accessibility to the impacted soils in the rear yard poses a risk via this pathway.
- Regarding reported groundwater results:
  - Exceedances of the adopted PFAS (PFHxS+PFOS) Interim Screening Criteria, representing exposure scenarios for domestic and recreational use of groundwater, were reported in samples taken from all the monitoring wells. Since the drinking water guidelines are more stringent than the recreational use criteria, results inherently exceeded the former guidelines.
  - The concentration values for PFOS and PFOA are crucial determinants for the exceedances in the adopted criteria for exposure scenarios considering human health and ecological protection. Reported PFOS and PFOA concentration values ranged from 0.61 – 1.0 µg/L and 0.07 – 0.90 µg/L, respectively.
  - A potential linkage in the source-pathway-receptor continuum for on-site and off-site groundwater is plausible, however is still subject to further investigation to confirm PFAS in groundwater down-hydraulic gradient. The extent/degree of PFAS in groundwater down-hydraulic gradient of the site has not been delineated.

Recommendations

To mitigate the potential ecological and human health exposure risks (i.e., those with confirmed or possible complete source-pathway-receptor linkages) identified in the DSI, the following recommendations are proposed:

– Further intrusive assessment works to delineate the nature and spatial extent of soil and groundwater contamination off-site to the north-east.
– Sealing of the unpaved rear yard where most of the samples with reported high PFAS concentrations were collected.
– Installation of a series of off-site groundwater monitoring wells (one up-hydraulic gradient and three down-hydraulic gradient, progressively further away from site) to assess the lateral extent of groundwater impacts and exposure risks via the groundwater pathway.
– Conduct a groundwater-use survey within the vicinity of the site to evaluate the potential exposure risk attributable to the possible use of groundwater for currently unidentified domestic/recreational purposes.

Limitations

This report is subject to, and must be read in conjunction with, the limitations set out in section 1.4 and the assumptions and qualifications contained throughout the Report.

Table of Abbreviations

Abbreviation	Full Form
AFAC	Australasian Fire and Emergency Service Authorities Council
AFFF	Aqueous Film-Forming Foam
AHD	Australian Height Datum
CoC	Contaminants of Concern
CSM	Conceptual Site Model
DO	Dissolved Oxygen
DQIs	Data Quality Indicators
EC	Electrical Conductivity
EV	Environmental Value
GAR	South Australian *Guidelines for the Assessment and Remediation of Site Contamination 2019*
GHD	GHD Pty Ltd
HEPA	Heads of Environment Protection Authorities Australia
HDPE	High-Density Polyethylene
HIL	Human Health Investigation Level
IP	Interface Probe
LOR	Limit of Reporting
m bgl	Metres Below Ground Level
MFS	South Australian Metropolitan Fire Service
mg/L	Milligrams/Litre
MW	Monitoring Well
NATA	National Association of Testing Authorities
NEMP	PFAS National Environmental Management Plan Version 2.0 - January 2020
NEPC	National Environmental Protection Council
NHMRC	National Health and Medical Research Council
PFAS	Per- and Poly-Fluoroalkyl Substances
PFHxS	Perfluorohexane Sulfonate
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
PFPeA	Perfluoropentanoic acid
PVC	Polyvinyl Chloride
QA/QC	Quality Assurance and Quality Control
RPD	Relative Percentage Difference
SA EPA	South Australian Environment Protection Authority
SAQP	Sampling and Analysis Quality Plan
SOP	Standard Operating Procedure

Abbreviation	Full Form
SPR	Source-Pathway-Receptor
SWL	Standing Water Level
TDS	Total Dissolved Solids
TOC	Top of Casing
µg/L	Micrograms/Litre
µS/cm	Microsiemens/centimetre

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1. Introduction

GHD Pty Ltd (GHD) was engaged by the South Australian (SA) Metropolitan Fire Service (MFS) to undertake a Detailed Site Investigation (DSI) for the Peterborough Fire Station, located at 86 Main Street, Peterborough, South Australia 5422 (the site).

The DSI is limited to potential impacts from the use of aqueous film-forming foams (AFFF) containing per- and poly-fluoroalkyl substances (PFAS) to address the action required by the SA Environment Protection Authority (EPA) (EPA GENI 62917) (refer Appendix A). Other potential contaminating activities and related contaminants of concern (CoC) were not included in this assessment.

1.1 Background

The Peterborough Station has been functional as a fire station since 1959, with land granted to the MFS on 13 July 1999 (MFS 2022). The site is currently staffed by retained firefighters who provide emergency response throughout the year.

Historically, the MFS have used AFFF containing PFAS at the site during training activities. The MFS commenced phasing out the use of firefighting foams containing perfluorooctane sulfonate (PFOS) in 2007 and perflurooctanoic acid (PFOA) in 2014 after consultation with the Australasian Fire and Emergency Service Authorities Council (AFAC) and SA EPA. The MFS replaced all firefighting foam in 2016 with a fluorine-free foam product. During 2017/2018, the MFS removed all fire extinguishers containing PFAS from their sites.

In 2022, GHD undertook a site history review of 17 MFS sites (GHD 2022), and inspections of eight metropolitan sites to support environmental risk profiling using a multi-criteria analysis approach. The work was required to address the potential risks associated with former use of AFFF containing PFAS. The sites were prioritised to assist with the implementation of appropriate assessment and management measures to address the potential PFAS risks. The GHD 2022 Report was provided to the SA EPA, who subsequently issued a letter dated 1 February 2023 (EPA GENI 62917) with the requirement of “a plan of proposed works and associated timelines to address the highest risk sites”.

In 2023, GHD completed a Preliminary Site Investigation (PSI) (GHD 2023a) and Sampling Analysis and Quality Plan (SAQP) (GHD 2023b) for the site. This DSI was prepared to address the data gaps identified in the PSI and the scope of works was undertaken in accordance with the SAQP.

1.2 Objectives

In accordance with the SA EPA requirements, the objectives if this investigation were to:

– Assess the nature and extent PFAS contamination in soils and groundwater, both on- and off-site.
– Assess the potential risks to human health and the environment associated with identified PFAS contamination on-site, in the context of continued commercial/industrial use.
– Assess the potential risks to human health and the environment associated with PFAS contamination migrating off-site, in the context of the relevant off-site land uses and environments.
– Provide recommendations to mitigate the potential impacts arising from identified residual source zones.

1.3 Scope of works

This DSI has been prepared with reference to industry standards and guidelines including:

– NHMRC 2008, Guidelines for Managing Risks in Recreational Water, National Health and Medical Research Council and Natural Resources Management Ministerial Council, Commonwealth of Australia, updated with the recent changes in the ADWG - V3.8 - September 2022.
– National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013 (ASC NEPM).

– Gov SA 2015, Environment Protection (Water Quality) Policy 2015 (WQEPP), Version 1.7.2020, Government of South Australia, updated 2020.
– ANZG 2018, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, online resource www.waterquality.gov.au/anz-guidelines, Australian and New Zealand Governments, updated 26 July 2021, (AWQG).
– SA EPA 2019a, Guidelines for the Assessment and Remediation (GAR) of Site Contamination, Environment Protection Authority, South Australia, November 2019.
– SA EPA 2019b, Guidelines for Regulatory Monitoring and Testing – Groundwater Sampling, Environment Protection Authority, South Australia, 2019.
– HEPA 2020, PFAS National Environmental Management Plan (Version 2.0), Heads of Environment Protection Authorities Australia and New Zealand, January 2020, (PFAS NEMP).
– NSW EPA 2022, Sampling Design Guidelines for Contaminated Land, Environment Protection Authority, New South Wales, August 2022.

The following scope of works was undertaken in general accordance with the SAQP (GHD 2023b):

– Advancement of five soil bores targeting the rear of the site where equipment washdown, flushing, training and AFFF (concentrate containing PFAS) storage is known to have occurred historically.
– Installation of three groundwater monitoring wells.
– Surveying of the newly installed groundwater monitoring wells relative to Australian Height Datum (AHD).
– Disposal of waste soil and groundwater by a licenced contractor.
– Development of a Conceptual Site Model (CSM), comprising an assessment of PFAS source areas, pathways and receptors.
– Preparation of this DSI.

1.4 Limitations

This report: has been prepared by GHD for South Australian Metropolitan Fire Service and may only be used and relied on by South Australian Metropolitan Fire Service for the purpose agreed between GHD and South Australian Metropolitan Fire Service as set out in section 1.3 of this report.

GHD otherwise disclaims responsibility to any person other than South Australian Metropolitan Fire Service arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of buildings, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

GHD has prepared this report on the basis of information provided by South Australian Metropolitan Fire Service and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

Accessibility of documents

If this report is required to be accessible in any other format, this can be provided by GHD upon request and at an additional cost if necessary

1.5 Assumptions

The assessment, conclusions and recommendations outlined in this report are based on the following assumptions:

– No fruit, vegetables or herbs are grown on site for consumptive purposes.
– The term PFAS refers to a large number of perfluorinated and polyfluorinated substances. The primary analytical suite adopted for this assessment incorporated 28 compounds, including PFOS, PFHxS and PFOA, which are the primary focus of this report.
– The screening levels used in this Report were consistent with the guidance provided by Australian regulators at the time of reporting.

2. Site information

2.1 Site identification

Site information details are summarised in Table 2.1 below.

Table 2.1 Summary of General Site Identification Information

Item	Detail
Site Address:	86 Main Street, Peterborough, SA 5422
Certificate of Title:	CT 5670/797
Legal Description:	Allotment 97, Filed Plan 215525 in the Area Named Peterborough, Hundred of Yongala
Local Government Authority:	Peterborough District Council
Current Zoning:	Township Main Street
Property Owner:	South Australian Metropolitan Fire Service
Current Site Use:	Operational Fire Station
Area:	994 m^2
Site Elevation:	536 m AHD

2.2 Site description

2.2.1 Site inspection and description

The site is an operational fire station, with approximately 11 part-time staff, located on Main Street, between Silver Street and William Street, north of the rail track. A site inspection was conducted by GHD field staff on 8 March 2023. At the time of inspection, the site comprised:

– One main, one-storey building, located in the northern portion of the site, which housed an engine bay for the site's one appliance, administrative offices and kitchen.
– A small, galvanised iron storage shed along the eastern boundary of the site, in which AFFF was historically stored. No AFFF containers were present on-site.
– An unsealed training yard in the southern portion of the site irrigated using mains water. There was formerly a training tower in the rear yard, which was removed several years ago.
– Ornamental vegetation was present in the rear yard along the western and eastern boundaries. No food produce was growing, and no livestock were present on-site.
– An active rail line, used predominantly for freight, is located directly south of the site with several trains passing through Peterborough each day.
– The site was fenced and inaccessible to the public. Entrance points from the northern boundary on Main Street were through the administrative building or via a side gate west of the main building.
– No odours or staining were noted during the site inspection.

Site photographs from the site inspection are presented in Appendix B.

2.2.2 Historical use and storage of PFAS

A questionnaire regarding historical use of AFFF at the site was circulated to MFS staff. The survey was completed on 28 June 2022 by a Fire Fighter, who has been working at the site since 1992. In addition, a retained Fire Fighter who had been at the site for over 5 years was present during the site inspection and provided further information. Copies of the completed survey can be found in Appendix C.

The date when PFAS containing AFFF was first used at the site is unknown, however, AFFF utilised at the site was known to be branded as '3M' as described by the Fire Fighter on-site.

PFAS-containing AFFF was historically stored on-site within the site storage shed. Foam was stored in plastic 20 L drums, with approximately 10 containers stored on-site at any given time. Spent drums of AFFF were washed out, with water draining into the stormwater system and the drums disposed of in the general waste collection.

Foam training exercises were generally undertaken quarterly, however MFS staff indicated training may have been undertaken annually. Foam training occurred in the rear yard over the unsealed lawn area in the southern portion of the site. MFS staff identified that the north-western area, also utilised for training, used to be on unsealed ground and was sealed with concrete approximately 10 years ago. Approximate locations of the training areas are outlined in Figure 1 and Figure 2.

The volume of AFFF historically used per training exercise was estimated to have been 20 L, which is the equivalent of one drum. Firefighters carried a 20 L drum of AFFF concentrate from the storage area to the training area, where the AFFF was transferred from the drum to an appliance via an induction hose. It was noted from information gathered from firefighting staff that this process was likely to produce localised spills. During the training exercises the AFFF was generally dispersed aerially over the whole training area and left to soak into the unsealed ground.

MFS staff confirmed that community events were historically held on-site, likely sometime within the 1990s. Anecdotal information indicated that during such events, large quantities of AFFF was dispersed into the rear yard for the community to use recreationally. This was undertaken in the same area as the foam training area.

Subsequent to emergency incidents involving the use of AFFF, appliances were washed down in the western yard or on the front apron on the concrete hardstand. The wash down water was left to soak into the ground or discharged off-site. It is noted that washing of appliances and equipment are not considered to be a risk of releasing AFFF. However, flushing of the AFFF system on the appliance and any equipment would likely have resulted in the release of AFFF.

2.3 Surrounding land use

A summary of the land use surrounding the site is provided in Table 2.2. The site's location and pertinent features are shown in Figure 1.

Table 2.2 Land Uses and Zoning

Orientation	Description of Land Use	Zoning (Municipal Council)
North	Main Street, a café and motorcycle display (Iron Horse Cafe) immediately north of site. Further north, from Kitchener Street, zoning changes to Neighbourhood with predominantly residential housing and open greenspace. Residential housing located immediately to the north-east of site.	Township Main Street
East	Public institution adjacent to the site (Peterborough District RSL Sub-Branch). Beyond is predominantly residential housing east of the site up to William Street with a café (The Tinsmith's Cottage) 80 m to the east. After William Street there are several commercial buildings.	Township Main Street
South	Immediately south of the site is a rail line, identified as utility industry land use. Beyond the rail line, zoning changes to Neighbourhood with predominantly residential housing as well as a school (St Joseph's School) 250 m south of the site.	Township Main Street
West	Buildings immediately west of the site up to Silver Street are commercial. Petrol station (Ampol Peterborough) and restaurant (Steamtown Dine-inn) are adjacent to the site. Heritage and District Council buildings are further west of the site on the other side of Silver Street.	Township Main Street

3. Previous investigations

Previous investigations at the Peterborough station have been carried out by GHD in 2019, 2022 and 2023, as documented in the following reports:

– GHD (2019) *MFS State-wide Appliance and Station Sampling*, Report for South Australian Metropolitan Fire Service, May 2019.
– GHD (2022) *MFS 17 Fire Stations PFAS Risk Profiling*, Report for South Australian Metropolitan Fire Service, October 2022.
– GHD (2023a) *MFS Peterborough Station Preliminary Site Investigation (PSI)*, Report for South Australian Metropolitan Fire Service 2023.
– GHD (2023b) *MFS Peterborough Station Sampling and Quality Plan (SAQP)*, Report for South Australian Metropolitan Fire Service 2023.

3.1 GHD (2019) MFS state-wide appliance and station sampling

In 2019, environmental investigations were carried out at 35 fire stations across South Australia to assess residual PFAS levels in firefighting appliances, soil and any biota (fruit, vegetables, herbs and poultry). Laboratory analyses of samples obtained from Peterborough Fire Station identified the following:

– Two surface soil samples (Peter1 and Peter2) collected from the rear yard, near the eastern boundary of the site, reported PFAS concentrations exceeding the PFAS NEMP Ecological Indirect exposure criteria for PFOS. Samples were below the PFAS NEMP Human Health Investigation Level (HIL B) residential minimal soil accessibility guidelines.
– Water samples were collected from the monitor, water tank, on-board hose reel (driver and passenger) and water delivery (driver and passenger) appliances. No exceedances of the MFS adopted criteria were reported. It should be noted that the appliances across the MFS stations in which exceedances were reported have been washed out and cleaned of any AFFF since the appliance sampling was undertaken.
– No groundwater or biota data were obtained.

Soil sampling locations from the 2019 sampling event can be found in Figure 3.

It is noted that the 2018 PFAS NEMP guidelines were used in this report, which were superseded by the 2020 PFAS NEMP 2.0. However, this has no practical impact on the purposes of this report as the guideline values for soil at commercial/industrial properties are the same in both versions of the PFAS NEMP. In the 2020 PFAS NEMP 2.0, environmental guidelines values that refer to the sum of PFOS and perfluorohexane sulfonate (PFHxS) now explicitly apply not only to the sum of the two but also to PFOS only and to PFHxS only, which was only inferred in the 2018 PFAS NEMP 1.0.

3.2 GHD (2022) MFS 17 fire stations PFAS risk profiling

GHD was engaged to undertake a desktop assessment and multi-criteria analysis (MCA) for MFS to support the appropriate risk management approaches associated with PFAS contamination at 17 fire stations across South Australia (eight metropolitan and nine regional). The Peterborough station was part of this assessment and was identified for prioritisation by the SA EPA in the letter GENI 62485, dated 21 October 2021.

The methodology and findings of the PFAS risk profiling for the 17 MFS fire stations reported PFAS impacted soils, with the desktop review focused on identifying historical activities that may represent a source of PFAS contamination and potentially sensitive human or ecological receptors in the vicinity of the sites, as well as understanding potential source-pathway-receptor linkages that may be present.

Based on the potential to cause harm to the environment and/or human health, the sites were prioritised within the report for further assessment, with the Peterborough station being classified as high priority for further investigation.

3.3 GHD (2023) MFS Peterborough Station Preliminary Site Investigation (PSI)

A preliminary site investigation was undertaken to review historical site activities which may have contributed to PFAS contamination at the site and potentially off-site.

The potential risks to human health and the environment outlined in the preliminary CSM were as follows:

– Consumption of contaminated groundwater extracted off-site for domestic/drinking purposes.
– Consumption of edible vegetation grown off-site where plants are irrigated with contaminated groundwater or where plant roots accessed shallow contaminated groundwater. It should be noted that no fruits or vegetables are present at the site.
– Direct dermal contact or incidental ingestion of contaminated soil, groundwater or surface water runoff from impacted surfaces (concrete or bitumen).
– Exposure of future site users, visitors, maintenance and construction workers to PFAS via direct dermal contact with contaminated soil, incidental ingestion of contaminated soil or inhalation of contaminated soil/dust from disturbed soils.
– Surface runoff, erosion or groundwater transporting the contaminants off-site to downstream/down-gradient neighbouring areas.
– An off-site CFS fire station may contribute to PFAS contamination of the surrounding area. However, this is yet to be determined.

3.4 GHD (2023) MFS Peterborough Station Sampling and Quality Plan (SAQP)

Following finalisation of the PSI, an SAQP was prepared to undertake intrusive investigations for the delineation of the lateral and vertical extent of PFAS contamination.

The purpose of the SAQP was to present the scope of work, methodologies, and sampling rationale to be utilised during the further intrusive works for this DSI to meet the investigation objectives.

– Based upon the preliminary CSM provided in the PSI, the following data gaps were identified:
  - The lateral and vertical extent of PFAS contamination in soil has not been delineated.
  - The lateral and vertical extent of PFAS contamination in groundwater has not been determined.
  - The degree of PFAS contamination in on-site concrete surfaces and the associated PFAS flux from these materials has not been assessed.
  - The potential for PFAS to leach from contaminated soil into groundwater has not been assessed.

4. Environmental setting

4.1 Topography

The topography of the site is relatively flat, as is land to the east and west. The site sits at an elevation of approximately 536 m AHD. A low set of ranges runs north to south through Peterborough, which is part of the wider Adelaide Geosyncline region.

Locally, the northern portion of the site slopes gently down towards Main Street. The rear yard in the southern portion of the site slopes gently down towards the south-eastern corner of the site.

4.2 Site drainage

The site is relatively flat, with a gentle downwards slope to the north from the apron and in the rear yard to the south-eastern corner. Stormwater runoff at the site is (and was historically) left to soak into the rear yard or discharged off-site via the stormwater drains on Main Street to the north. There have been no changes to the stormwater management at the site over time and stormwater has not been harvested.

The western side of the main building was concreted approximately 10 years ago but was previously unsealed. This area was used for appliance parking during training and washdown. The front apron in the northern portion of the site is sealed with concrete hardstand. Some areas of the concrete hardstand were noted to have cracks. The apron slopes down to Main Street to the north where surface runoff would join the stormwater system.

Stormwater from the site flows northward to an open drain, then west to a dam approximately 1.4 km to the west of the site.

4.3 Surface water

The nearest surface water body is an open drain, located 0.3 km north of the site. There is also a wetland, located approximately 0.92 km south-west of the site in Victoria Park. There are two dams within 2.0 km of the site, one 1.2 km to the east on Cemetery Road and the other 1.4 km west adjacent to West Terrace.

4.4 Geology

The PSI (GHD 2023a) indicated the site is characterised by Holocene high to low angle slope deposits, both colluvium and alluvium. The site soil classification in the region is Calcarosol and soil type is loam over pedaric red clay. This includes hills and hill slopes of grey-brown highly calcareous loamy soils with shallow calcareous loamy soils, brown shallow porous loamy soils and rock outcrops.

Surrounding soil types include calcareous loam on clay (340 m north), calcareous loam on rock (480 m north-west), shallow soil on rock (620 m south-west) and deep gravelly soil (850 m west).

The site lies within a region of extremely low probability (1-5%) of potential acid sulphate soil occurrence.

Boreholes advanced on the site during the DSI indicate that the geology at the site is relatively consistent with regional geology.

4.5 Hydrogeology

A search of the South Australian Resources Information Gateway (SARIG) database reported deep groundwater in the vicinity of the site with standing water levels (SWL) of approximately 10-20 m below ground level (bgl), producing yields in the range of 0.5-2.5 L/second. Groundwater salinity ranged from 1,500-3,000 mg/L total dissolved solids (TDS), indicating fresh to brackish water.

4.6 Local Groundwater Users (WaterConnect Database)

A search of groundwater wells within a 2.0 km radius was conducted using the SA WaterConnect Database. The search has identified 139 wells located within the 2.0 km radius of site vicinity. The results are summarised as follows:

– There were 139 registered wells within a 2.0 km radius.
– Of these registered wells, 28 were listed as backfilled, 10 as operational, three as abandoned, two as not located and no status was listed for 96 wells.
– Of the 10 registered operational wells, five were listed for irrigation purposes, two as domestic, two as domestic/stock and one as town water supply (public/municipal).
– Of the 96 wells with no registered status, 17 were listed for investigation purposes, 12 for monitoring, seven for domestic, seven for irrigation, two for stock and 59 had no purpose listed.
– TDS data were available for 58 wells within the 2.0 km radius of the site and ranged between 314 mg/L and 5,069 mg/L, indicating fresh to moderately brackish water. The five closest wells with TDS data less than 30 years old ranged between 1,147 mg/L to 3,731 mg/L, indicating slightly brackish water (1,000-3,000 mg/L) to moderately brackish water (3,000-10,000 mg/L).

Anecdotal information of the use of groundwater for domestic purposes was noted during the site inspection interview.

5. Assessment criteria

PFAS is the key CoC being address by this environmental investigation. As such, the assessment criteria for this investigation were adopted from the following documents:

– HEPA 2020, PFAS National Environmental Management Plan (Version 2.0), Heads of Environment Protection Authorities Australia and New Zealand, January 2020, (PFAS NEMP).
– NHMRC 2011, Australian Drinking Water Guidelines 6 (ADWG), Version 3.8, National Water Quality Management Strategy, National Health and Medical Research Council and Natural Resources Management Ministerial Council, Commonwealth of Australia, updated September 2022.

The assessment was also undertaken in general accordance with the following guidelines and policy documents:

– NEPM 2013, National Environment Protection (Assessment of Site Contamination) Measure, Australian Government, amended 11 April 2013. www.nepc.gov.au/nepms/assessment-site-contamination.
– ANZG 2018, Australian and New Zealand Guidelines for Fresh and Marine Water Quality, online resource www.waterquality.gov.au/anz-guidelines, Australian and New Zealand Governments, updated 26 July 2021, (AWQG).
– Gov SA 2015, Environment Protection (Water Quality) Policy 2015 (WQEPP), Version 1.7.2020, Government of South Australia, updated 2020.
– NHMRC 2008, Guidelines for Managing Risks in Recreational Water, National Health and Medical Research Council and Natural Resources Management Ministerial Council, Commonwealth of Australia, updated with the recent changes in the ADWG – V3.8 – September 2022.
– SA EPA 2019a, Guidelines for the Assessment and Remediation (GAR) of Site Contamination, Environment Protection Authority, South Australia, November 2019.
– SA EPA 2019b, Guidelines for Regulatory Monitoring and Testing – Groundwater Sampling, Environment Protection Authority, South Australia, 2019.
– NSW EPA 2022, Sampling Design Guidelines for Contaminated Land, Environment Protection Authority, New South Wales, August 2022.

5.1 Soil

In accordance with the PFAS NEMP (2020), the PFAS assessment criteria listed in Table 5.1 have been adopted for the assessment of soil samples.

Table 5.1 Adopted PFAS Assessment Criteria – Soil

Exposure Scenario	PFHxS [1]	PFOS [2]	Sum of PFOS and PFHxS	PFOA [3]	Principal Reference Document
Human Health Investigation Levels (HIL)					
HIL B residential with limited soil contact[4]	2 mg/kg	2 mg/kg	2 mg/kg	20 mg/kg	PFAS NEMP (HEPA 2020)
Site-specific HILs[5] for the screening of PFAS contaminated soils at MFS sites (Regional, Retained)	-	-	40 mg/kg	50 mg/kg	Derivation of site-specific health investigation levels for urban and regional fire stations (GHD, June 2023)
Ecological Screening Levels					
Ecological indirect exposure	-	0.14 mg/kg	-	-	PFAS NEMP (HEPA 2020)
Ecological direct exposure	-	1 mg/kg	-	10 mg/kg	

Notes:
[1] PFHxS – perfluorohexane sulfonate.
[2] PFOS – perfluorooctane sulfonate.
[3] PFOA – perfluorooctanoic acid.
[4] Trigger level for further union engagement.
[5] Discussed further in section 5.1.1.

The typical usage patterns at MFS fire stations most closely align with the exposure assumptions that underpin HIL D (commercial/industrial) values. The following inconsistencies are however noted:

– The PSIs undertaken at MFS sites across South Australia has identified that some fire stations have a higher proportion of unsealed ground (up to approximately 75% of the total site area) than has been assumed in the derivation of the HIL D values (up to approximately 20% of the total site area). As a result of this, there may be greater opportunities for direct access to soil at MFS fire stations, including the ingestion of soil and soil-derived dust.
– The shifts worked by MFS firefighters do not align with the assumption of a standard working week that underpins the HIL D values.

Given these factors, Site-specific Health Investigation Levels (SSHILs) have been derived using exposure assumptions that reflect the typical usage pattern of MFS fire stations, to allow for tailored assessment of the potential exposure risks that may be associated with the presence of PFAS in shallow soils (GHD 2023c).

5.1.1 Human health soil guideline values

The PFAS NEMP (Section 8, 2020) provides nationally agreed guideline values that are to be used to inform site investigations. The human health-based investigation levels for soil were derived using a methodology consistent with assumptions set out in the ASC NEPM for the health investigation levels (HILs).

As noted above, the GHD letter report titled *Derivation of site-specific Health Investigation Levels (HILs) for urban and regional fire stations* (GHD, July 2023) outlines site-specific HILs for the two categories of MFS fire stations, namely metropolitan and regional, also referred to as “staffed” and “retained”, respectively. The methodology and associated exposure assessment processes are outlined in ASC NEPM (as amended 2013). The SSHILs will be adopted in place of the generic HIL D (commercial/industrial) guidelines from the PFAS NEMP 2.0.

GHD understands that the MFS, in consultation with the United Fire Fighters Union of South Australia, have agreed to also adopt a more stringent health investigation level (i.e. HIL B – residential with minimal opportunities for soil access) as a “trigger” for further engagement. This has been included at the direction of MFS and is for comparison purposes only.

5.1.2 Ecological soil guideline values

The PFAS NEMP provides the following guidance regarding potential ecological risks associated with PFAS-impacted soils:

– For intensively developed sites with no secondary consumers and minimal potential for indirect ecological exposure, a higher criterion of up to 0.14 mg/kg may be appropriate.
– The indirect exposure value may be over-protective if the area of exposed soil is too small to have any material impact on food chain transfer to secondary consumers such as invertivores and carnivores. In this situation, considering site-specific characteristics may justify the use of a higher value (up to 0.14 mg/kg) as the trigger for a detailed site-specific investigation of risk.

The PFAS NEMP does not provide a rationale for the selection of the 0.14 mg/kg, however GHD notes that this value was sourced from the same document as the other ecological criteria, namely Environment and Climate Change Canada (ECCC 2017) *Federal Environmental Quality Guidelines Perfluorooctane Sulfonate (PFOS)*. This document provides 0.14 mg/kg as the soil guidelines for PFOS in two circumstances:

– Soil Quality Guideline to Protect Freshwater Life under all land uses.
– Soil Quality Guideline for Off-site migration under commercial/industrial land uses.

The soil quality guideline to protect freshwater aquatic life is the concentration in soil that is expected to protect against potential impacts on freshwater aquatic life from PFOS originating in soil that may enter the groundwater and subsequently discharge to a surface water body. The calculation of this value was made on the basis of the Canadian aquatic screening criteria for PFOS in surface water (6.8 ug/L) and a reverse fate and transport modelling process that assumes a minimum of 10 m lateral separation between the source and the surface water body and incorporates default parameters describing partitioning from soil to leachate, leaching to groundwater, mixing with groundwater and plume migration.

Wind and water erosion of soil can move PFOS contaminated soil from one site to another. The endpoint used to calculate this guideline is the soil quality guideline protective of ecological receptors in residential and agricultural land use settings (0.01 mg/kg - the ecological indirect criteria). A model was then used to predict the movement of soil, including the Universal Soil Loss Equation and the Wind Erosion Equation. Canadian Council of Ministers of the Environment (CCME) (2017) specifically states that this approach is imprecise and that the derived values should be used as a check mechanism only, with professional judgement used to assess whether this is likely to be a migration pathway of concern for an individual site. Given the predominantly commercial land use surrounding the site, it is unlikely than any soil migrating from the site via erosion would be deposited in an area of significant ecological value.

Although the CCME (2017) guidelines have been superseded, the more recent guidelines (Specific Criteria Document for the Development of the Canadian Soil and Groundwater Quality Guidelines for the Protection of Environmental and Human Health - Perfluorooctane Sulfonate) use a similar approach and derive similar values. The reference to the CMME (2017) for this document is to maintain consistency with the PFAS NEMP 2.0 and the original reference material within that document.

5.2 Groundwater

5.2.1 Environmental values of groundwater

The South Australian Environment Protection (Water Quality) Policy 2015 (and amendments) (SA EPA 2015) (EPP) details the regulatory requirements for the protection of all water bodies (surface and groundwater) under the Environment Protection Act 1993. The Policy outlines the applicable environmental values (EVs) for a range of waters, including public stormwater and irrigation drains as well as providing definitions of harm, types of pollutants and the provisions that a person must comply with in taking all reasonable and practicable measures to prevent or minimise harm. Table 5.2 outlines the EVs for various waters as described in Schedule 1 of the EPP.

Table 5.2 Environmental Values of Particular Waters (Extract from Schedule 1, Table 3 WQEPP)

Waters	Aquatic ecosystems	Recreation and aesthetics	Drinking water for human consumption	Irrigation and general use	Livestock watering	Aquaculture and aquatic food production
Marine waters	X					X
Surface waters	X		X	X	X	X
Surface waters (Protection area[1])	X	X	X	X	X	X
Public stormwater systems	X	X				
Groundwaters						
TDS < 1,200 mg/L			X	X	X	X
TDS between 1,200 - 3,000 mg/L				X	X	X
TDS between 3,000 - 12,000 mg/L					X	X

Note:
[1] Water protection area means a part of the State for the time being declared by proclamation to be a water protection area (EPA 1993).

While not identified specifically in the EPP, contaminated site assessments typically take into account the potential for abstraction of groundwater for recreational use and migration to aquatic ecosystems so these EVs are included in the assessment process.

To assess the contamination status of groundwater at a site, the GAR (SA EPA 2019a) provides a four-step process to determine the environmental values of groundwater and if actual or potential harm to groundwater that is not trivial has occurred. The four-step process provided in the GAR is described in Table 5.3.

Table 5.3 Four-step Process for Determining Environmental Values of Groundwater

Process	Assessment
Step 1: Apply Table 3 of Schedule 1 of the 2015 Water Quality Environment Protection Policy (WQEPP, Gov SA 2015) based on TDS ranges.	The PSI report (GHD 2023) listed 139 registered bores located within a 2.0 km radius of the site. TDS data were available for 58 wells within the 2.0 km radius of the site and ranged between 314 mg/L and 5,069 mg/L, indicating fresh to moderately brackish water. The five closest wells with TDS data less than 30 years old ranged between 1,147 mg/L to 3,731 mg/L, indicating slightly brackish water (1,000-3,000 mg/L) to moderately brackish water (3,000-10,000 mg/L).
Step 2: Assess and identify surface water bodies within a 2 km buffer of the site.	The nearest surface water bodies to the site are an open drain, 0.3 km north and a wetland is 0.9 km south-west. There are two dams within 2.0 km of the site, one 1.2 km to the east on Cemetery Road and the other 1.4 km to the west on West Terrace.

Process	Assessment
Step 3: Review registered groundwater users in the WaterConnect database.	A review of the WaterConnect database provided in the Lotsearch report (Appendix B) identified a total of 139 registered bores within a 2.0 km radius of the site. The identified uses of the bores with operational or no status were for: investigation (17), domestic (7), domestic/stock (2), irrigation (7), monitoring (12), stock (2) and town water supply (public/municipal) (1).
Step 4: Application of the SA EPA recognised criteria for the most sensitive environmental value.	The most sensitive environmental values to be applied to the site are PFAS NEMP 2020 Drinking Water for human health. The most sensitive environmental value for ecological receptors is the 99% freshwater ecological guidelines.

Based on the assessment outlined in Table 5.3, the groundwater criteria have been selected to protect the relevant environmental values identified for groundwater underlying the area of investigation.

For the purpose of this assessment, criteria have been included to:

– Assess the potential risk to people using groundwater for domestic and drinking purposes, (i.e., potable use).
– Assess the potential risk to people using groundwater for recreational purposes (i.e., filling of swimming pools, discharge of groundwater to surface water bodies which are used for recreational activities).
– Assess the potential risk to users of groundwater for irrigation of edible vegetation.

The adopted groundwater screening/investigation levels, which are considered to protect potentially complete source-receptor linkages, are summarised in Table 5.4.

Table 5.4 Adopted PFAS Interim Screening Criteria for Groundwater

Exposure Scenario	PFOS[1]	PFHxS[2]	Sum of PFOS and PFHxS	PFOA[3]	Source
Human Health – Recreational Water (domestic)	0.7 µg/L	0.7 µg/L	0.7 µg/L	5.6 µg/L	NHMRC 2008 ADWG (NHMRC 2011)[4]
Human Health – Drinking Water[5]	0.07 µg/L	0.07 µg/L	0.07 µg/L	0.56 µg/L	PFAS NEMP (HEPA 2020) ADWG (NHMRC 2011)
Freshwater 95% Species Protection – Slightly to moderately modified ecosystems	0.13 µg/L	-	-	220 µg/L	PFAS NEMP (HEPA 2020)
Fresh waters 99% Species Protection – High conservation value ecosystems	0.00023 µg/L	-	-	19 µg/L	PFAS NEMP (HEPA 2020)

Notes:
[1] PFOS – perfluorooctane sulfonate.
[2] PFHxS – perfluorohexane sulfonate.
[3] PFOA – perfluorooctanoic acid.
[4] The NHMRC 2008 Guidelines for Managing Risks in Recreational Water recommend health guideline values for recreational water that correspond to 10 times the current drinking water guideline value. These guideline values apply in a domestic setting where groundwater is used for recreational purposes such as the filling of swimming pools.
[5] Australian Drinking Water Guidelines 6, Version 3.8, updated September 2022.

6. Soil investigation

6.1 Soil sample locations and rationale

The soil investigation works described in this section were conducted between 22 to 24 September 2023 under the supervision of an experienced GHD environmental professional. A total of five bores (BH01 to BH06, with the exclusion of BH02 due to access constraints) were drilled as part of the soil investigation. Four surface soil samples were collected between soil bores from the rear yard of the station. The investigation locations are shown in Figure 2.

A summary of the rationale behind each soil bore location is provided in Table 6.1 and each surface location is provided in Table 6.2.

Table 6.1 Soil Bore Location Rationale

Proposed Soil Bore ID	Location Rationale
BH01	Sample from concrete hardstand west of the main building. Located on truck washdown area.
BH02	Sample from concrete hardstand in rear yard. Not drilled due to access issues.
BH03	Sample from north-west corner of unsealed area in rear yard. Located in area of historic AFFF use.
BH04	Sample from northern portion of unsealed area in rear yard. Located in area of historic AFFF use.
BH05	Sample from centre of unsealed area in rear yard. Located in area of historic AFFF use.
BH06	Sample from southern portion of unsealed area in rear yard. Located in area of historic AFFF use.

Table 6.2 Surface Soil Location Rationale

Proposed Soil Bore ID	Location Rationale
SS01	Grid formation in the unsealed area of the rear yard where historical PFAS use took place.
SS02	
SS03	
SS04	

GHD notes the number of soil sampling locations was in accordance with the NSW Sampling Design Guidelines requirement for the minimum number of sampling locations for a site with an area of 994 m^2.

6.2 Methodology

The methodologies detailed below are in accordance with the following guidelines:

– HEPA (2020) PFAS NEMP (Version 2.0), Heads of Environment Protection Authorities Australia and New Zealand, January 2020, (PFAS NEMP).
– National Environment Protection (Assessment of Site Contamination) Measure (1999) as amended in 2013 (ASC NEPM).
– WA DER (2017) Interim Guideline of Assessment and Management of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS), Version 2.1, Contaminated Sites Guidelines, Department of Environment Regulation, Western Australia, Perth, January 2017.

The soil investigation methodology was as follows:

– Prior to any intrusive works being undertaken, a review of Before You Dig (BYD) plans was conducted and all investigation locations were cleared for the presence of underground service by an accredited service locator.

– A total of 8 bores (BH01, BH03 to BH06 and MW01 to MW03) were drilled as part of the soil investigation. Locations positioned within hardstand areas required concrete/paver cutting prior to drilling.
– All soil bores were advanced via drill rig utlising push tube drilling techniques. High density polyethylene (HDPE) core liners were used to retrieve soil cores to minimise the risk of PFAS cross-contamination.
– Soils recovered from each soil bore were logged by an experienced GHD environmental professional in accordance with AS 1726:2017, and representative soil samples were collected at regular depth intervals and/at each new soil horizon for potential laboratory analyses.
– A fresh pair of disposable gloves were worn by the sampler when collecting each individual sample and soil samples were placed in laboratory-supplied sampling jars suitable for PFAS analysis. Soil samples from soil bores were collected immediately following drilling. In general, soil samples were taken at near surface (0.1 m bgl), at 0.5 m bgl and every 0.5 m thereafter.
– Soil samples were stored in a cool box and transported to a National Association of Testing Authorities (NATA) accredited laboratory under chain of custody documentation.

6.3 Soil analytical program

All soil samples were submitted to a NATA accredited laboratory for analysis. In general, two primary samples from each borehole were analysed, with each sample analysed for PFAS extended-suite compounds.

6.4 Soil sampling results

6.4.1 Subsurface conditions

Fill material was encountered at all locations assessed, generally comprising of fine-to-medium sand with medium-to-coarse gravel. The fill was primarily brown in colour with some white and dry. No staining, distinguishable odours or fragments of asbestos debris were noted during sampling.

All locations consisted primarily of natural soils with the general composition being low plasticity, dry and medium dense silty sands before progressing to deeper clayey sands and clayey silt bedrock. The colouring of material graduated from brown and white fill to brown natural soils and grey with mottled yellow bedrock.

Borehole collapse occurred at BH01 and pushtube refusal occurred at BH03 to BH06 due to dense, dry soils. A summary of materials encountered at the site is provided in Table 6.3. Detailed borelogs can be found in Appendix D.

Table 6.3 Summary of Lithologies Encountered

Lithology	Depths observed (m bgl)	Description
Fill	0.1 - 0.2	Clayey SAND; low to medium plasticity, medium sands, poorly graded, brown and white, dry, medium dense.
	0.2 - 1.1	Silty SAND; fine to medium sands, poorly graded, brown, with rock fragments, dry, medium dense.
Natural soils	0.2 - 3.9	Silty SAND; fine to medium sands, poorly graded, brown and white, with rock fragments, dry, dense.
	3.9 - 5.6	Sandy CLAY; medium plasticity, fine to medium sands, brown, with some rock fragments, dry, firm.
	4.2 - 4.4	Gravelly SAND; fine to medium sands, poorly graded, brown, with rock fragments, dry, medium dense.
Bedrock	6.4 - 10.0	Clayey SILT; low plasticity, grey with mottled yellow, dry, dense.

6.4.2 Analytical results

Exceedances of the adopted assessment criteria protective of human health and the environment are presented in Table 6.4 and Figure 5. PFAS concentrations in all remaining soil samples were reported to be below the laboratory reporting limits or below the adopted assessment criteria.

The laboratory certificates for the analytical soil results, along with chain of custody and sample receipt notifications are provided in Appendix F. A full set of tabulated analytical results can be found in Appendix G.

Table 6.4 Results above Adopted PFAS Assessment Criteria

Location	Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFOA (mg/kg)	Sum of PFHxS and PFOS (mg/kg)
BH01	0.5	0.0154	0.27	0.0015	0.285
BH03	0.1	<0.005	0.15	<0.005	0.15
BH04	0.5	0.013	0.4	<0.005	0.413
	2.5	0.055	0.28	<0.005	0.335
BH05	0.5	0.019	0.81	<0.005	0.829
	2.5	0.0075	0.62	0.0005	0.626
BH06	0.5	<0.005	0.51	<0.005	0.51
MW01	0.5	0.021	0.81	<0.005	0.831
MW02	0.5	0.022	1.1	<0.005	1.122
MW03	0.5	<0.005	0.39	<0.005	0.39
SS02	0.0	0.022	0.33	<0.005	0.352
SS03	0.0	0.0070	0.18	<0.005	0.187

Notes:

Darker blue denotes an exceedance of the ecological indirect exposure for developed sites assessment criteria.

Pale blue denotes an exceedance of the ecological direct exposure assessment criteria.

The concentrations of all remaining PFAS chemicals in samples assessed were reported either below the laboratory reporting limits or below the adopted ecological and health assessment criteria. Detections of PFAS in soil were reported above the Limit of Reporting (LOR) to a depth of 4.5 m bgl (BH01_4.5). All soil results from 4.5 m bgl onwards were lower than the LOR.

It is noted there were no exceedances of the adopted human health criteria (PFAS NEMP HIL B and MFS site-specific HIL).

7. Groundwater investigation

7.1 Groundwater well locations and rationale

Three groundwater wells (MW01 to MW03) were installed at the site on 22 to 23 September 2023:

– MW01 was installed in the north-western corner of the rear yard.
– MW02 was installed in the south-western corner of the rear yard.
– MW03 was installed adjacent to the eastern boundary of the rear yard, approximately midway of the northern and southern extents.

These locations were chosen based on the historic use of AFFF within the rear yard to assess the degree and extent of PFAS groundwater impacts in this source zone. In addition, the arrangement of the wells facilitated the interpolation of groundwater flow direction by means of triangulation.

The location of the monitoring wells is shown on Figure 2.

7.2 Well installation methodology

All groundwater monitoring wells were drilled and installed by WB Drilling Pty Ltd under the supervision of an experienced GHD environmental professional. The drilling method used included push-tube and solid flight auger to the base of the boreholes. Well permits were obtained from the Government of South Australia's Department of Environment and Water. Copies of well permits are provided in Appendix H. The well construction methodology is outlined below:

– Each monitoring well was drilled to a depth of 14 - 15 m bgl. Water strike was determined through various observations including appearance of water, changes in soil moisture content as well as drill speed and torque readings on the drill rig gauges.
– 3 m slotted polyvinyl chloride (PVC) screens were installed at the base of the boreholes with solid PVC casing to the surface. The PVC was installed with approximately 1 m of screen above the top of the intersected aquifer to account for seasonal groundwater level variations.
– A gravel pack was installed around the screen extending 1 m above the top of screen.
– A bentonite plug was installed above the sand pack to protect the aquifer from any direct infiltration of surface water into the well screens.
– The rest of the annulus was filled with cement slurry.
– A lockable gatic cover was installed and concreted in place, approximately flush to the surrounding ground surface.
– Following installation, the groundwater wells were developed to remove excess silt/entrained sediments and to ensure representative groundwater was flowing into the well. The wells were developed using a submersible groundwater pump.
– Groundwater wells were surveyed by a licensed surveyor (Linkup Construction Surveys Pty Ltd). The survey results are included in Appendix I.

Groundwater well construction logs are presented in Appendix D. Table 7.1 presents a summary of the construction details along with survey details (elevation) of the wells.

Table 7.1 Well Construction Details

Item	Details		
Well ID	**MW01**	**MW02**	**MW03**
Date Installed	22/9/2023	22/9/2023	22/9/2023
Bore Depth (m bgl)	15.0	15.0	15.0
Screen & Casing	PVC Class 18	PVC Class 18	PVC Class 18
Screen & Casing Internal Diameter (mm)	50	50	50
Screen Length (m)	3	3	3
Casing Length	15	15	15
Well Depth (m bgl)	15	15	15
Ground Level (m AHD*)	531.739	531.772	531.770
Top of Casing (TOC) Level (m AHD)	11.64	11.67	11.67
Filter Pack	Filter gravel (8/16) pack from base of the well to 0.5m above the screen.	Filter gravel (8/16) pack from base of the well to 0.5m above the screen.	Filter gravel (8/16) pack from base of the well to 0.5m above the screen.
Casing Seal	0.1 m of activated bentonite placed on top of the filter pack. Grouted from the bentonite layer to the ground surface.	0.1 m of activated bentonite placed on top of the filter pack. Grouted from the bentonite layer to the ground surface.	0.1 m of activated bentonite placed on top of the filter pack. Grouted from the bentonite layer to the ground surface.
Well Cover	Flush mounted “Gatic” road cover.	Flush mounted “Gatic” road cover.	Flush mounted “Gatic” road cover.

7.3 Groundwater sampling methodology

Groundwater samples were collected in accordance with GHD’s standard operating for groundwater sampling and in accordance with SA EPA guidelines for regulatory monitoring and testing – Groundwater sampling (SA EPA 2019b).

All groundwater wells were left for a minimum of five days following well development to allow for the stabilisation of aquifer conditions. Groundwater sampling was conducted on 27 September 2023.

All groundwater wells were gauged prior to sampling. The standing water levels were measured from the top of the well casing (TOC) using an interface probe (IP).

All monitoring wells were purged and sampled using a low flow sampling technique (bladder pump). During purging, field groundwater quality parameters were collected including pH, redox potential, dissolved oxygen, electrical conductivity and temperature to ensure stable conditions prior to sample collection.

Groundwater samples were collected in appropriate containers suitable for PFAS analysis whilst using clean nitrile gloves between sample locations to prevent cross-contamination. The samples were subsequently stored in a cooler and were delivered under chilled conditions to the analytical laboratory with accompanying chain of custody documentation.

The groundwater gauging and sampling records are provided in Appendix J.

7.4 Groundwater analytical program

The laboratories used for the groundwater investigation were ALS Laboratory Group (primary laboratory) and Eurofins (secondary laboratory). Both laboratories are accredited by the NATA and the analyses conducted were within their NATA schedules of accreditation.

All groundwater samples were subject to PFAS long-suite analyses with a standard LOR. Quality Assurance and Control (QA/QC) samples (field blanks, rinsate blanks and duplicate pairs) were also analysed as part of quality control protocol.

7.5 Groundwater investigation results

7.5.1 Subsurface conditions

Fill material was comprised of fine-to-medium sand with medium-to-coarse gravel. The fill was primarily brown in colour with some white and dry. No staining, distinguishable odours or fragments of asbestos debris were noted during sampling.

Natural soils were generally characterised by low plasticity, dry and medium dense silty sands before progressing to deeper clayey sands and clayey silt bedrock. The colouring of material graduated from brown and white fill to brown natural soils and grey with mottled yellow bedrock.

Groundwater well drilling logs are presented in Appendix D.

7.5.2 Groundwater levels and inferred groundwater flow

Groundwater levels in the wells were gauged from the marked point on the well casing on 18 October 2023 using an electronic interface water level meter during the groundwater monitoring event. The groundwater gauging sheets are attached in Appendix J and the well survey results are provided in Appendix I. The groundwater levels are presented in Table 7.2.

Table 7.2 Relative Groundwater Levels (AHD)

Well ID	Surveyed TOC (m AHD)	Surveyed Ground Level (m AHD)	Depth to Groundwater (m bTOC)	Relative Groundwater Level (m AHD)
MW01	531.739	531.838	11.64	520.099
MW02	531.772	531.860	11.67	520.102
MW03	531.770	531.863	11.67	520.100

The groundwater gauging results were used to interpolate a groundwater contour map shown on Figure 4. Groundwater was inferred to flow in a north-eastly direction, which is consistent with the expected regional groundwater flow and previous records.

7.5.3 Field measured water quality parameters

No contamination indicators (such as hydrocarbon presence, chemical odours or sheens) were noted in any of the monitoring wells during the well installation, well development or sampling phases of the investigation.

Groundwater quality parameters were monitored during purging and before sampling. The final values of these parameters prior to sampling are summarised in Table 7.3.

Table 7.3 Field Measured Groundwater Quality Parameters

Well ID	Date Sampled	Temp (°C)	pH	Total Dissolved Solids (mg/L)	Oxidation-reduction Potential (mV)	Electrical Conductivity (µS/cm)
MW01	27/09/2023	18.6	7.35	1,408.64	12.60	2,201
MW02	27/09/2023	20.3	7.56	1,740.80	39.4	2,720
MW03	27/09/2023	18.6	7.31	1,498.24	64.5	2,341

Note:
Conversion factor of 0.64 used to convert field conductivity (µS/cm) to TDS (mg/L).

Given the result of the in-situ physiochemical analysis as shown on Table 7.3 the following observations were drawn:

– The groundwater encountered at the site is neutral with pH ranging between 7.31 and 7.56.
– Groundwater is considered brackish given the high electrical conductivity and TDS values.

7.5.4 Analytical Results

A summary of exceedances of the adopted groundwater criteria can be found in Table 7.4 and represented in Figure 6. Detailed analytical groundwater results are provided in Appendix G. The laboratory certificates of analysis are contained in Appendix F.

Table 7.4 Summary of Groundwater Exceedances against Adopted Criteria

Location	Date	PFHxS (µg/L)	PFOS (µg/L)	PFOA (µg/L)	Sum of PFHxS and PFOS (µg/L)
MW01	27/09/2023	48	1.00	0.90	49.0
MW02	27/09/2023	2.9	0.61	0.07	4.8
MW03	27/09/2023	28	0.70	0.81	28.7

Notes:
Blue denotes an exceedance of the freshwater - 95% assessment criteria.
Yellow denotes an exceedance of the ADWG recreational assessment criteria.
Green denotes an exceedance of the ADWG health assessment criteria.

8. Quality Assurance and Quality Control

A detailed QA/QC assessment was completed for all analytical sample data, in order to determine whether the data was of suitable quality on which to base the site assessment. This included the collection and review of inter- and intra-laboratory duplicates and rinsate blank samples.

The QA/QC assessment found that the majority QA/QC Data Quality Indicators (DQIs) were within the specified requirements. Some PFAS compounds reported relative percentage differences (RPD) exceedances, however this is likely due to the low concentrations of PFAS compounds detected in the samples. The data is, therefore considered to be valid and of sufficient quality to rely on for the purpose and objectives of this assessment. A copy of the QA/QC report is provided in Appendix K.

9. Conceptual Site Model

Fundamental to any contamination investigation is the development of a CSM, which is a description of the plausible mechanisms ('pathway'), by which people and ecology ('receptors') may be exposed to chemicals in the environment ('sources'). Potential risks to human health or the environment cannot occur unless there is a complete Source-Pathway-Receptor (SPR) linkage. Conversely, complete SPR linkages do not by default indicate a risk and the site investigation process is used to evaluate the extent of potential risks.

Based on the potential SPR linkages identified in the preliminary site investigation (GHD 2023a), and additional information gleaned during this investigation, the CSM developed for the site has been refined and is summarised in Table 9.1.

SPR linkages were assessed under the following categories:

– Unknown – Not enough data available to indicate if a linkage is present or absent.
– Possible – Data indicates PFAS impacts, or a potential source has been identified, and receptors are present, however source extent and/or pathways to a receptor are not understood.
– Likely – PFAS impact has been confirmed and pathways to receptors are likely present, however extent of the connection has not been confirmed or is not fully understood.
– Confirmed – PFAS impact greater than the adopted assessment criteria are shown to be present at the receptor, hence SPR linkage has been confirmed present.
– Unlikely – Source and/or pathways have not been identified or have been identified below the assessment criteria protective of the receptor, hence SPR linkage is unlikely complete.

Visual representation of the CSM is shown in Figure 7 & Figure 8.

Table 9.1 CSM for PFAS exposure – SPR Linkage Assessment

Source	Potential Receptors	Exposure Pathways	Risk from exposure through SPR Linkages
On-site PFAS impacted soils	Site users, visitors, maintenance, and construction workers	Direct dermal contact with contaminated soil	**Unlikely** Site-specific Health Investigation Levels (SSHILs) have been derived using exposure assumptions that reflect the typical usage pattern of regional MFS fire stations. It is noted, however, that a more conservative land use guideline – HIL B (residential with limited soil access) – has been adopted following a precautionary approach and as a trigger for further union engagement. PFAS concentrations detected to date in on-site soils were below the adopted assessment criteria. It is considered unlikely that site users, visitors, maintenance or construction workers would be exposed to PFAS quantities detrimental to their health.
		Incidental ingestion of contaminated soil	
		Inhalation of contaminated soil or dust from disturbed soils	
	Ecosystem at, and immediately surrounding, the site	Direct contact with contaminated soil	**Confirmed** Analytical results have indicated the presence of PFAS concentration in soils exceeding the direct and indirect ecological criteria. Exceedances were noted in samples taken within the unpaved rear yard which served as part of the historical training and wash area. PFAS soil impacts have been detected to depths of about 2.5 meters. Identified plants within the site includes grasses and shrubs. A potential SPR linkage can be drawn given the accessibility of the impacted soils within the rear yard.
		Ingestion of contaminated soil	
		Bioaccumulation through indirect contact	
	Groundwater beneath the site	Rainwater/surface runoff leaching impacted soil followed by migration through porous media into groundwater	**Confirmed, however extent and degree of the impact need to be delineated** Analytical results of the groundwater samples taken from the on-site monitoring wells have yielded PFAS concentrations that are above the adopted PFAS criteria. The presence of PFAS in the groundwater samples likely indicates the percolation of PFAS to the aquifer beneath the site from historical activities that involved the utilisation of AFFF.
		Historical soaking of washdown wastewater into the ground	
		Historical soaking of washdown wastewater into the ground	
Off-site PFAS impacted soils	Off-site maintenance and subsurface construction workers	Direct dermal contact with contaminated soil	**Unlikely** PFAS concentrations detected to date in on-site soils were below the adopted SSHILs. It is considered unlikely that off-site visitors, maintenance, or construction workers would be exposed to PFAS quantities detrimental to their health. However, the full extent of PFAS impacts in soils on-site and off-site has not been determined yet.
		Incidental ingestion of contaminated soil	
		Inhalation of contaminated soil or dust from disturbed soils	
	Off-site future residential occupants	Direct dermal contact with contaminated soil	**Possible**

Source	Potential Receptors	Exposure Pathways	Risk from exposure through SPR Linkages
		Incidental ingestion of contaminated soil	Analytical results of the soil samples taken on-site have shown PFAS concentrations exceeding the Tier 1 HIL A for residential properties with gardens/accessible soil. The presence of PFAS in soils on-site have already been confirmed, however its lateral and vertical extent on-site and off-site has not yet been delineated.
		Uptake through edible vegetation or biota	
		Inhalation of contaminated soil or dust from disturbed soils	
	Off-site public open space	Direct dermal contact or ingestion of contaminated soils	**Possible** PFAS concentrations detected to date in on-site soils indicated one sample exceeded the adopted Tier 1 HIL C for public open space land use. It is considered unlikely that off-site visitors, maintenance, or construction workers would be exposed to PFAS quantities detrimental to their health. However, the definite extent of PFAS impacts in soils on-site and off-site has not yet been delineated.
	Ecosystem surrounding the site	Direct contact with contaminated soil	**Possible** Analytical results of the soil samples taken on-site have shown relatively high concentrations of PFAS exceeding the direct and indirect ecological criteria. Given the circumstance, the migration extent of PFAS beyond the site is possible.
		Ingestion of contaminated soil	
		Bioaccumulation through indirect contact	
	Groundwater beneath impacted soil	Rainwater/surface runoff leaching impacted soil followed by migration through porous media into groundwater	**Likely** The potential of PFAS leaching from contaminated soil into the groundwater has not been tested yet. However, given the presence of PFAS concentrations in groundwater tested to date, it is considered likely that impacted soils are an on-going source of groundwater contamination.
PFAS-impacted groundwater	People using groundwater for: domestic and drinking purposes	Consumption of contaminated groundwater	**Possible** Given the analytical results of groundwater samples reporting the presence of PFAS concentrations, certainty on the contamination is amenable, however the definite extent and degree of PFAS groundwater contamination down- hydraulic gradient still needs to be assessed. In addition, the presence of the 139 wells within a 2 km radius of the site poses moderate- to high-risk in the exposure pathway.
	People using groundwater for irrigation of vegetable gardens and/or fruit trees with which they grow produce for consumption	Consumption of fruit and vegetables irrigated with contaminated groundwater	**Possible** The exposure pathway arising from the potential use of contaminated groundwater to irrigate vegetable gardens and/or fruit trees is plausible given the following: – The analytical results of groundwater samples have reported the presence of PFAS concentrations, however the definite extent and

Source	Potential Receptors	Exposure Pathways	Risk from exposure through SPR Linkages
			nature of PFAS contamination on-site and down-hydraulic gradient still needs to be assessed. – Two registered wells identified within a 2 km radius of the site are utilised for irrigation purposes. – Likeliness of residential properties within the 2 km radius of the site that have gardens or open spaces cultivated for fruit and vegetables. A potential linkage in the source-pathway-receptor continuum is plausible, however still subject to further investigation to delineate the extent/degree of PFAS in groundwater down-hydraulic gradient.
	People growing edible vegetation and/or in open soil which may interact with groundwater	Consumption of PFAS impacted edible vegetation	**On-site: No** MFS staff have removed all edible vegetation from MFS sites.
			Off-site: Possible Given the following circumstances: – The analytical results of groundwater samples have yielded presence of PFAS concentrations, certainty on the contamination is amenable, however the definite extent and degree of PFAS contamination off-site or down hydraulic gradient is yet to be delineated. – Two registered wells identified within a 2 km radius of the site are utilised for irrigation purposes. – Likeliness of residential properties within the 2 km radius of the site that have garden or open spaces cultivated for fruit and vegetables. A potential linkage in the source-pathway-receptor continuum is plausible, however still subject to further investigation to confirm and delineate the extent/degree of PFAS in groundwater down-hydraulic gradient.
	People using groundwater for recreational purposes such as filling of swimming pools, or ingress of contaminated groundwater into surface water bodies used for recreational purposes	Incidental ingestion of contaminated groundwater	**Possible** The extent of PFAS in groundwater down-hydraulic gradient of the site has not been delineated and one well within a 2 km radius of the site was identified as having an environmental/recreational purpose.
	Down gradient off-site maintenance and sub-surface construction workers that contact PFAS contaminated groundwater	Direct dermal contact or incidental ingestion of contaminated groundwater	**Unlikely** Whilst it is possible that off-site maintenance or sub-surface construction workers could incidentally ingest contaminated groundwater, it is unlikely that they will ingest quantities detrimental to their health.

10. Discussion

10.1 Soil results summary

From a precautionary approach, the PFAS NEMP (2020) HIL B human health-based investigation levels for soil have been adopted by the MFS to prompt further union engagement. The HIL B investigation levels assume no potential use of soil for consumption of home-grown produce, such as dwellings with fully paved yard spaces. Site-specific health investigation levels have also been derived using exposure assumptions that reflect the typical usage pattern of MFS fire stations, to allow for tailored assessment of the potential exposure risks that may be associated with the presence of PFAS in shallow soils (GHD 2023c).

No exceedances of HIL B or the MFS regional (retained) stations assessment criteria were reported during the investigation. The vertical and lateral extent of PFAS impacts have been delineated to the adopted assessment criteria for current site use (i.e., HIL B and MFS regional (retained) stations). The potential risks to human health for the current site use are considered low and acceptable.

The PFAS NEMP 2.0 (2020) direct and indirect ecological exposure risk values for PFOS are protective of organisms that are in direct contact with soil (i.e., plants and worms) and secondary consumers (i.e., birds, small mammals, and reptiles), respectively. The PFAS NEMP (2020) indirect ecological exposure value of 0.01 mg/kg is a default value derived for all land use scenarios. However, the PFAS NEMP (2020) also states that this guideline value may be overprotective and site-specific characteristics may justify the use of a higher value (0.14 mg/kg), for example in scenarios where a site is located within an extensively built-up urban setting. The default value of 0.01 mg/kg is therefore not considered relevant as the site does not provide high quality foraging habitat for higher trophic level organisms.

The analytical results of most soil samples have shown PFOS concentrations that exceeded the criteria for indirect ecological exposure (developed sites). A total of 20 soil samples were taken from 12 sampling locations strategically distributed within the historical training site and wash down area. Out of these, 11 samples have yielded concentrations exceeding the guideline values for indirect ecological exposure (developed sites) and 1 sample had yielded concentration values of exceeding the guideline values for direct ecological exposure.

Highest concentrations of PFOS were recovered from soil samples within the surface and near surface depths. Maximum depths at which PFOS concentrations were detected was approximately 4.5 meters. Relatively higher PFOS concentrations, exceeding the adopted ecological criteria, were detected in samples BH05, BH06 and MW01, ranging from 0.51 to 0.81 mg/kg. These samples were collected from sampling locations strategically distributed in the middle portion of the unpaved rear yard and in the north-western portion of the rear yard, near the historical PFAS storage area.

PFOS detections within the soil samples taken from the unpaved rear yard indicates the intrusive presence of PFAS which can be attributed to previous site activities, including the use of PFAS-containing AFFF. Dispersal of PFAS concentrations within the unpaved rear yard was likely prompted by direct and indirect transport mechanisms (e.g., over spraying, surface run-off percolating, wash down activities) with subsequent deposition of PFAS in soils. Delineation of the vertical extent and degree of PFAS impacts are subject to further investigation as deeper strata soil samples (up to 4.5 m bgl) and Q1 aquifer groundwater samples reported exceedances above the adopted assessment criteria. A potential complete linkage in the source-pathway-receptor continuum for ecological exposure can be drawn as the accessibility to the impacted soils in the rear yard poses a risk via this exposure pathway.

10.2 Groundwater results summary

Exceedances of the adopted PFAS (PFHxS+PFOS) Interim Screening Criteria, representing exposure scenarios associated with human health and ecological protection, were reported in groundwater samples taken from all three of

the monitoring wells. Exposure scenarios include the use of groundwater for drinking, for recreational utilisation and as an interim level for freshwater species protection (90% – 95% species protection).

Considering the following conditions, potential linkages in the SPR continuum both on-site and off-site are plausible, however is still subject to further investigation to confirm PFAS in groundwater down-hydraulic gradient:

– Certainty on the presence of PFAS in the groundwater beneath the site as implied by the analytical results of groundwater samples which have yielded concentrations of Perfluorohexane sulfonic acid (PFHxS) and Perfluorooctane sulfonic acid (PFOS) exceeding the adopted criteria.
– A search of the South Australian Resources Information Gateway (SARIG) database reported deep groundwater in the vicinity of the site with standing water levels (SWL) of approximately 10-20 m bgl, producing yields in the range of 0.5-2.5 L/second. Groundwater salinity ranged from 1,500-3,000 mg/L TDS, indicating fresh to brackish water.
– Identification of 139 registered wells within a 2.0 km radius which have varying utilisation purposes.
– Likely presence of residential properties within the 2.0 km radius of the site that have garden or open spaces cultivated for fruit and vegetable plants.
– North-east inferred groundwater flow direction.

The extent and degree of PFAS in groundwater down-hydraulic gradient of the site has not yet been delineated. In addition, the interaction of groundwater with nearby surface waters (and associated potential impacts) via direct discharge cannot be discounted at this stage, as this is dependent on further delineation.

11. Conclusions and Recommendations

Based on the results of this investigation the following conclusions have been made:

- Boreholes advanced on-site during the DSI indicate that the geology at the site is relatively consistent with the regional geology, characterised by Holocene high-to-low angle slope colluvium and alluvium deposits.
- PFAS impacts in soil at the site are most likely related to historical fire station activities including training and storage of PFAS-containing AFFF.
- Regarding reported soil results:
  - The highest reported concentrations of PFAS in soils have been identified within the southern portion of the site where the unpaved rear yard is situated.
  - No exceedances of human health HIL B or the MFS regional (retained) stations assessment criteria were reported in soil during the investigation. The potential risks to human health for the current site use are considered low and acceptable.
  - A total of 20 soil samples were taken from 12 sampling locations strategically distributed across the historical training site and wash down area. Out of these, 11 samples have yielded concentrations exceeding the guideline values for indirect ecological exposure (developed sites) and one sample had yielded concentrations exceeding the guideline values for direct ecological exposure.
  - Highest concentrations of PFOS were recovered from samples from the surface and near surface depths. The maximum depth at which PFOS was detected was approximately 4.5 m.
  - Relatively higher PFOS concentrations exceeding the adopted ecological criteria were detected in samples BH05, BH06 and MW01, ranging from 0.51 to 0.81 mg/kg. These samples were collected from sampling locations strategically distributed in the middle portion of the unpaved rear yard and in the north-western portion of the rear yard, near the historical PFAS storage area.
  - Delineation of the vertical extent and degree of PFAS impacts are subject to further investigation as deeper strata soil samples (up to 4.5 m bgl) and Q1 aquifer groundwater samples reported exceedances above the adopted assessment criteria.
  - A potential complete linkage in the SPR continuum for ecological exposure can be drawn as the accessibility to the impacted soils in the rear yard poses a risk via this pathway.
- Regarding reported groundwater results:
  - Exceedances of the adopted PFAS (PFHxS+PFOS) Interim Screening Criteria, representing exposure scenarios for domestic and recreational use of groundwater, were reported in samples taken from all the monitoring wells. Since the drinking water guidelines are more stringent than the recreational use criteria, results inherently exceeded the former guidelines.
  - The concentration values for PFOS and PFOA are crucial determinants for the exceedances in the adopted criteria for exposure scenarios considering human health and ecological protection. Reported PFOS and PFOA concentration values ranged from 0.61 – 1.0 µg/L and 0.07 – 0.90 µg/L, respectively.
  - A potential linkage in the source-pathway-receptor continuum for on-site and off-site groundwater is plausible, however is still subject to further investigation to confirm PFAS in groundwater down-hydraulic gradient. The extent/degree of PFAS in groundwater down-hydraulic gradient of the site has not been delineated.

The following recommendations are made:

- Further intrusive assessment works to delineate the nature and spatial extent of the contamination off-site to the north-east.
- Sealing of the unpaved rear yard where most of the samples with reported higher PFAS concentrations were collected.

- Installation of a series of off-site groundwater monitoring wells (one up-hydraulic gradient and three down-hydraulic gradient, progressively further away from site) to assess the lateral extent of groundwater impacts and exposure risks via the groundwater pathway.
- Conduct a groundwater-use survey within the vicinity of the site to evaluate the potential exposure risk attributable to the possible use of groundwater for currently unidentified domestic/recreational purposes.

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Figures

Figure 1 *MFS Peterborough Site Location Plan*

Figure 2 *MFS Peterborough Soil and Groundwater Sampling Locations*

Figure 3 *MFS Peterborough Historical Soil Sampling Locations*

Figure 4 *MFS Peterborough Interpolated Groundwater Contour Map*

Figure 5 *MFS Peterborough Soil Exceedances of Adopted Criteria*

Figure 6 *MFS Peterborough Groundwater Exceedances of Adopted Criteria*

Figure 7 *MFS Peterborough Conceptual Site Model*

Figure 8 *MFS Peterborough Conceptual Site Model Cross Section*



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Paper Size ISO A3

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Meters

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Map Projection: Transverse Mercator
Horizontal Datum: GDA 2020
Grid: GDA 2020 MGA Zone 54

GHD

South Australian Metropolitan Fire Service
Peterborough DSI

Peterborough MFS Site Location Plan

Project No. **12616806**
Revision No. **A**
Date **31/10/2023**

FIGURE 1

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Data source: GHD: Site Boundary (2022); DPTI: Cadastre, Roads (2015). World Imagery: Imagery (Imagery Date: 18/12/2022; Date Extracted: 01/03/2023). Created by: ejuan



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Map Projection: Transverse Mercator
Horizontal Datum: GDA 2020
Grid: GDA 2020 MGA Zone 54

GHD

South Australian Metropolitan Fire Service
Peterborough DSI

Peterborough MFS Soil and Groundwater Bore Locations

Project No. **12616806**
Revision No. **B**
Date **23/02/2024**

FIGURE 2

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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 54

GHD

South Australian Metropolitan Fire Service
PSI/SAQP for MFS High Risk Sites

Peterborough Historical Sampling Locations

Project No. **12616806**
Revision No. **A**
Date **31/05/2023**

FIGURE 3

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Print date: 31 May 2023 - 17:17

Data source: GHD: Site Boundary (2022); DPTI: Cadastre, Roads (2015). World Imagery: Imagery (Imagery Date: 18/12/2022; Date Extracted: 01/03/2023). Created by: ejuan



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Paper Size ISO A3

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Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 2020
Grid: GDA 2020 MGA Zone 54

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GHD

South Australian Metropolitan Fire Service
Peterborough DSI

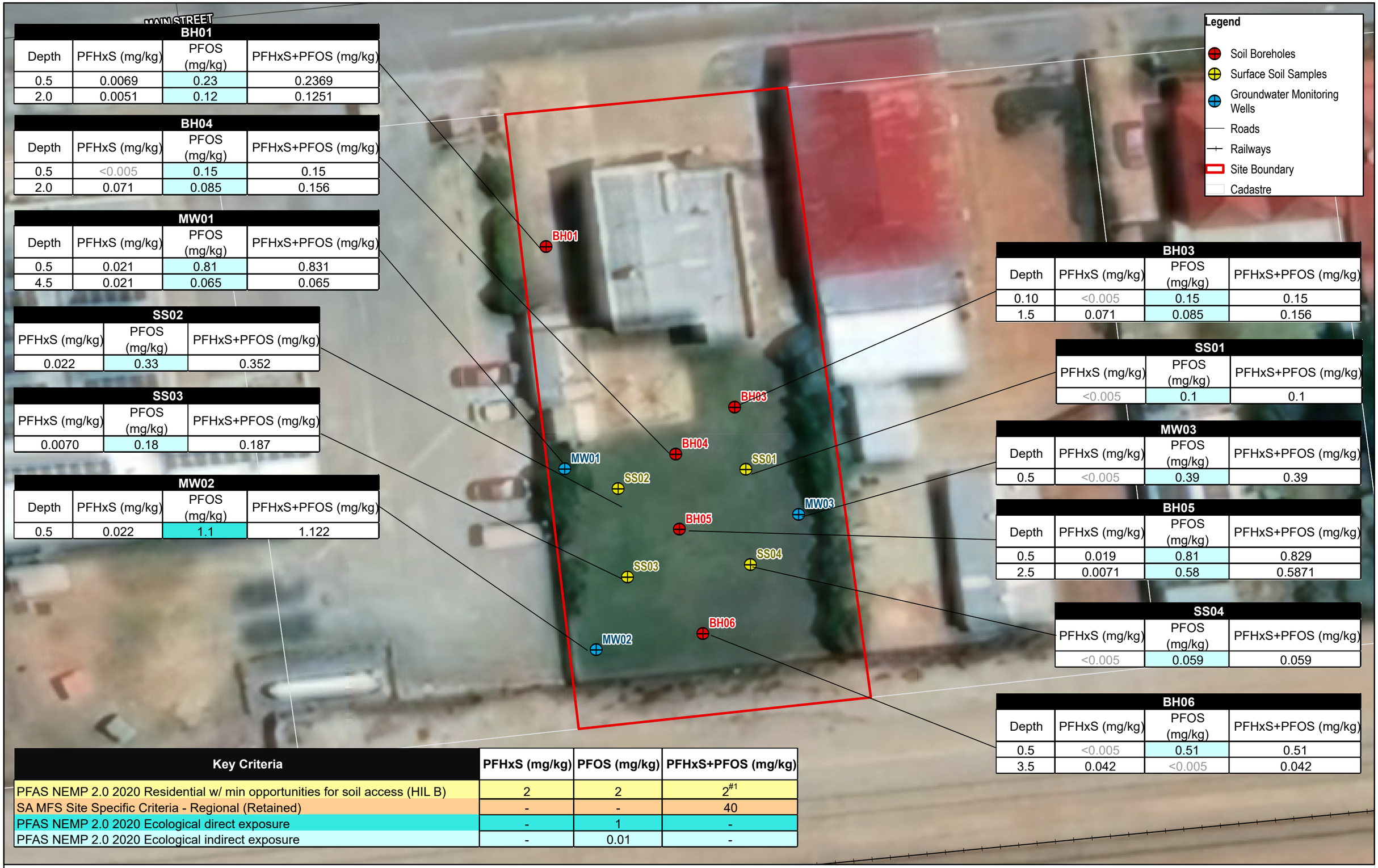
Peterborough MFS
Groundwater Contour Map

Project No. **12616806**
Revision No. **A**
Date **01/12/2023**

FIGURE 4

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Print date: 01 Dec 2023 - 09:58

Data source: GHD: Site Boundary (2022); DPTI: Cadastre, Roads (2015). World Imagery: Imagery (Imagery Date: 18/12/2022; Date Extracted: 01/03/2023). Created by: ejuan



BH01

Depth	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.5	0.0069	0.23	0.2369
2.0	0.0051	0.12	0.1251

BH04

Depth	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.5	<0.005	0.15	0.15
2.0	0.071	0.085	0.156

MW01

Depth	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.5	0.021	0.81	0.831
4.5	0.021	0.065	0.065

SS02

PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.022	0.33	0.352

SS03

PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0070	0.18	0.187

MW02

Depth	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.5	0.022	1.1	1.122

BH03

Depth	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.10	<0.005	0.15	0.15
1.5	0.071	0.085	0.156

SS01

PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
<0.005	0.1	0.1

MW03

Depth	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.5	<0.005	0.39	0.39

BH05

Depth	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.5	0.019	0.81	0.829
2.5	0.0071	0.58	0.5871

SS04

PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
<0.005	0.059	0.059

BH06

Depth	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.5	<0.005	0.51	0.51
3.5	0.042	<0.005	0.042

Key Criteria	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)	2	2	2[#1]
SA MFS Site Specific Criteria - Regional (Retained)	-	-	40
PFAS NEMP 2.0 2020 Ecological direct exposure	-	1	-
PFAS NEMP 2.0 2020 Ecological indirect exposure	-	0.01	-

Data Disclaimer

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Paper Size ISO A3

0 2 4 6 8

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 2020
Grid: GDA 2020 MGA Zone 54

N

GHD

South Australian Metropolitan Fire Service
Peterborough DSI

Peterborough MFS Soil Exceedances of Adopted Criteria

Project No. 12616806
Revision No. A
Date 04/12/2023

FIGURE 5

\\ghdnet\ghd\AU\Melbourne\Projects\33\12616806\GIS\Maps\Deliverables\12616806_Figures.aprx
Print date: 04 Dec 2023 - 12:58

Data source: GHD: Site Boundary (2022); DPTI: Cadastre, Roads (2015). World Imagery: Imagery (Imagery Date: 18/12/2022; Date Extracted: 01/03/2023). Created by: ejuan



MW01		
PFHxS (µg/L)	PFOS (µg/L)	PFHxS+PFOS (µg/L)
48	1.0	**49**

MW02		
PFHxS (µg/L)	PFOS (µg/L)	PFHxS+PFOS (µg/L)
2.9	0.52	**3.42**

MW03		
PFHxS (µg/L)	PFOS (µg/L)	PFHxS+PFOS (µg/L)
28	0.70	**28.7**

Key Criteria	PFHxS (µg/L)	PFOS (µg/L)	PFHxS+PFOS (µg/L)
ADWG 2011 Health (v3.7 updated 2022)	-	-	**0.07**
ADWG 2011 Recreational (v3.7 updated 2022)	-	-	**0.7**
PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems		0.13	-
PFAS NEMP 2.0 2020 Freshwater - 99% - high conservation value systems	-	0.00023	-

Data Disclaimer

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Paper Size ISO A3

0 2 4 6 8

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 2020
Grid: GDA 2020 MGA Zone 54

N

GHD

South Australian Metropolitan Fire Service
Peterborough DSI

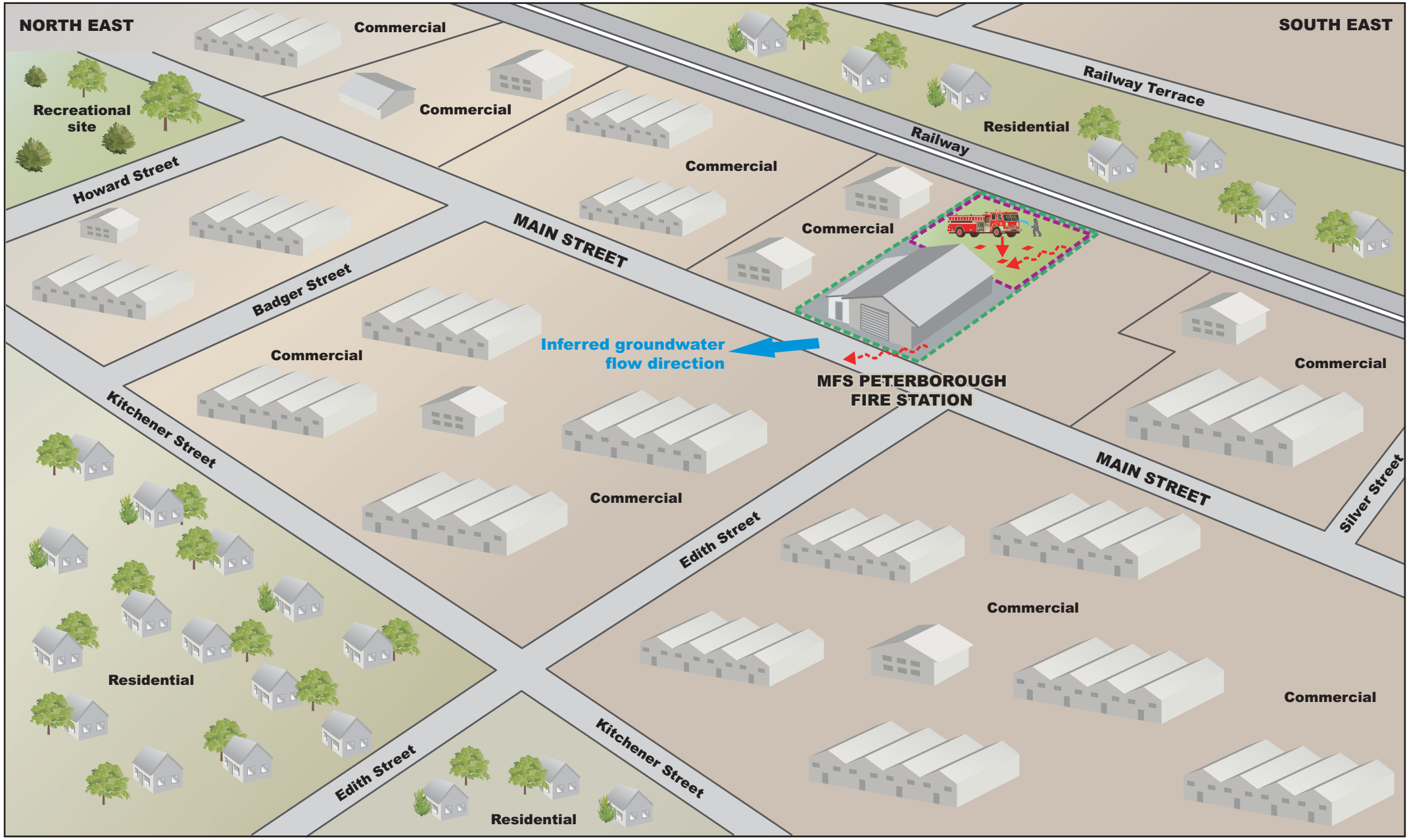
Peterborough MFS Groundwater Exceedances of Adopted Criteria

Project No. **12616806**
Revision No. **A**
Date **04/12/2023**

FIGURE 6

\\ghdnet\ghd\AU\Melbourne\Projects\33\12616806\GIS\Maps\Deliverables\12616806_Figures.aprx
Print date: 04 Dec 2023 - 13:00

Data source: GHD: Site Boundary (2022); DPTI: Cadastre, Roads (2015). World Imagery: Imagery (Imagery Date: 18/12/2022; Date Extracted: 01/03/2023). Created by: ejuan



LEGEND

- Site boundary
- Washdown area
- PFAS migrating vertically to groundwater
- Discharge of PFAS run-off to stormwater drains
- Stormwater drain

Conceptual diagram only - not to scale

GHD

SA MFS
Peterborough Fire Station
86 Main Street, Peterborough, South Adelaide, SA 5422

Conceptual site model

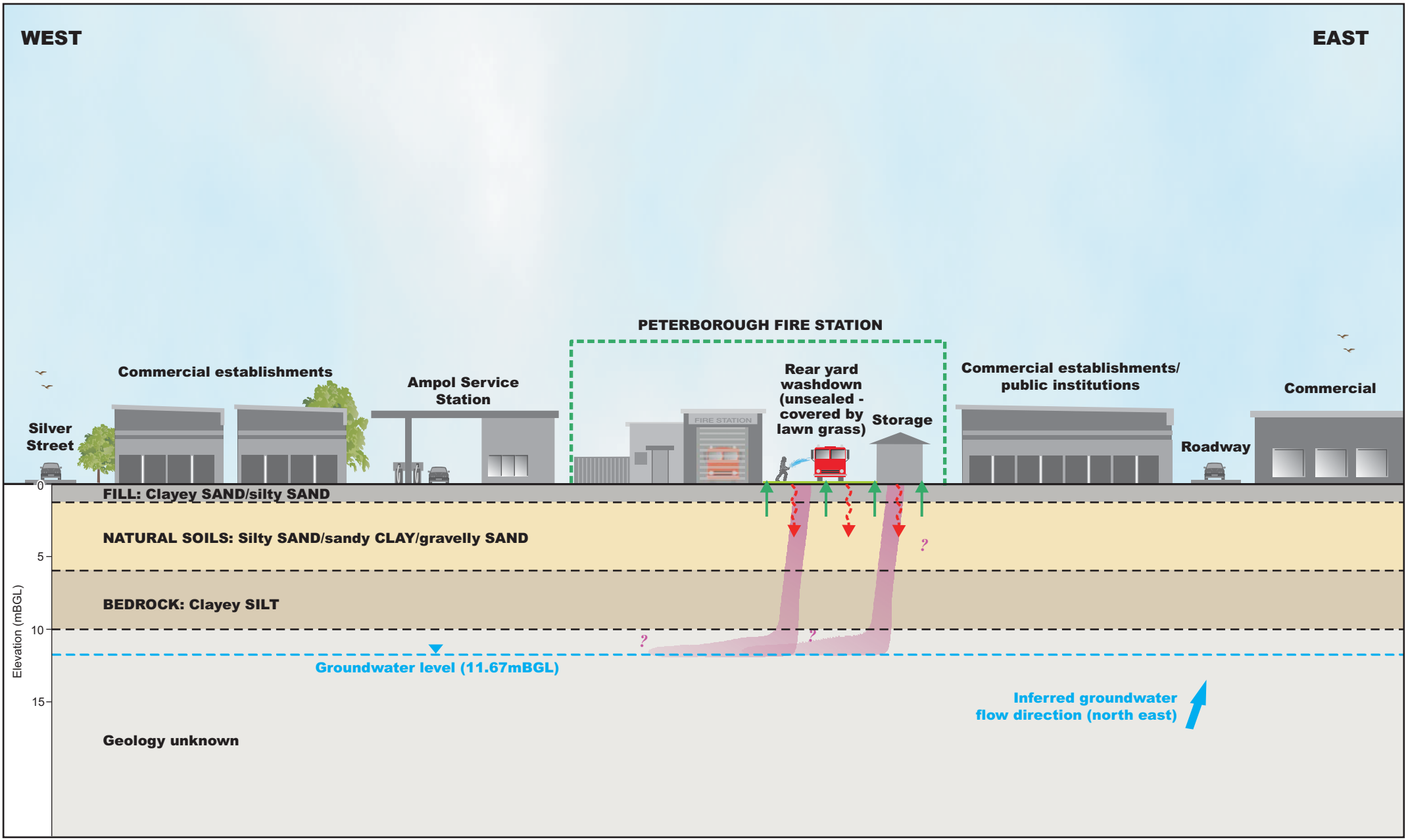
Project No. 12616806
Revision No. A
Date 09/01/2024

FIGURE 7

AU\Launceston\Projects\Admin\Graphics\12\616806\12616806_LST_01.cdr

Level 4, 211 Victoria Square Adelaide SA 5000 T 61 8 8111 6600 F 61 8 8111 6699 E ademail@ghd.com W www.ghd.com

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LEGEND

- Inferred PFAS point source
- PFAS biotic uptake (transpiration)
- PFAS impacted surface runoff infiltration

Conceptual diagram only - scale is approximate

GHD

SA MFS
Peterborough Fire Station
86 Main Street, Peterborough, South Adelaide, SA 5422

Conceptual site model cross section

Project No. 12616806
Revision No. A
Date 09/01/2024

FIGURE 8

AU\Launceston\Projects\Admin\Graphics\12\616806\12616806_LST_02.cdr

Level 4, 211 Victoria Square Adelaide SA 5000 T 61 8 8111 6600 F 61 8 8111 6699 E ademail@ghd.com W www.ghd.com

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Appendices

Appendix A

SA EPA Letter GENI 62917

Environment Protection Authority
GPO Box 2607 Adelaide SA 5001
T (08) 8204 2004
Country areas 1800 623 445

EPA GENI 62917

Krystle Mitchell
Senior Scientific and Environmental Officer
South Australian Metropolitan Fire Service
By Email: Krystle.Mitchell@eso.sa.gov.au

Dear Ms Mitchell,

RE: REVIEW OF SITE CONTAMINATION REPORT – ACTION REQUIRED

Site: Various Metropolitan Fire Service (MFS) Fire Stations, South Australia

Thank you for providing the Environment Protection Authority (EPA) with a copy of the following report:

- *MFS 17 Fire Stations PFAS Risk Profiling*, prepared by GHD and dated 26 October 2022.

The above report documents a desktop risk profiling and prioritisation assessment completed for 17 MFS stations previously identified as containing PFAS contamination, based on limited site sampling completed in 2019 (GHD 2019)[1].

The EPA requests that you submit a plan of proposed works and associated timelines to address the highest risk sites by **30 June 2023**.

If you agree to undertake the above listed works it is requested that you submit written acknowledgement to the EPA stating as such. If you wish to discuss potential alterations to the recommended works or delivery date please contact the EPA as soon as possible.

It is not clear in the above report whether stations where no soil sampling was completed, or where the limited sampling showed no site contamination, were considered as part of the risk screening assessment. The EPA notes that the sampling documented in GHD (2019) was highly limited and may not capture all potential PFAS source areas at a station. The EPA recommends that these stations be risk profiled if not undertaken previously.

Please provide a copy of this letter to your engaged consultant to assist them in developing a scope of works for the relevant sites. Fact sheets relating to your obligations under the *Environment Protection Act 1993* and how to engage a site contamination consultant be found at www.epa.sa.gov.au. If you would like further assistance on this matter please contact Brooke Ryan on (08) 8204 8525 or at brooke.ryan2@sa.gov.au.

Yours sincerely

HCustance
Hannah Custance

PRINCIPAL ADVISER, SITE CONTAMINATION

ENVIRONMENT PROTECTION AUTHORITY

Date: 1 February 2023

Cc: Ben Petticrew, Technical/Project Director – Contamination Assessment and Remediation, GHD (ben.petticrew@ghd.com)

[1] *MFS State Wide Appliance and Station Sampling*, prepared by GHD and dated May 2019.

Appendix B

Photolog

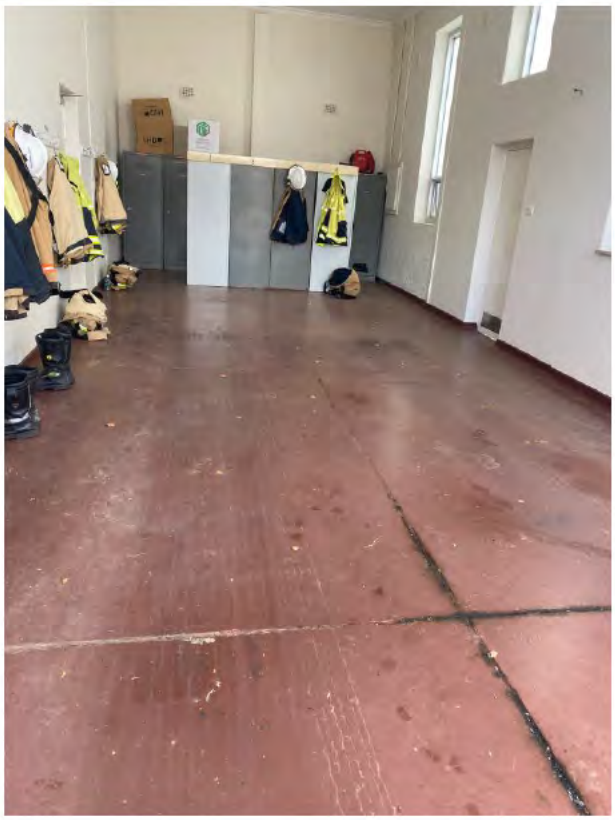
Site Details

Site Name	Peterborough
Site Address	86 Main Street, Peterborough SA 5422
Inspection Date	March 8, 2023 11:00 AM
Inspector (GHD)	[redacted]

Photograph Log

ID	Description	Photograph
1	**Facing:** SW **Description:** Front of station, including apron	

ID	Description	Photograph
2	**Facing:** SE **Description:** Front of station, including apron	
3	**Facing:** N **Description:** Back of station, including rear yard and storage shed	

ID	Description	Photograph
4	**Facing:** **Description:** Flooring inside engine room	
5	**Facing:** S **Description:** Inside engine room	

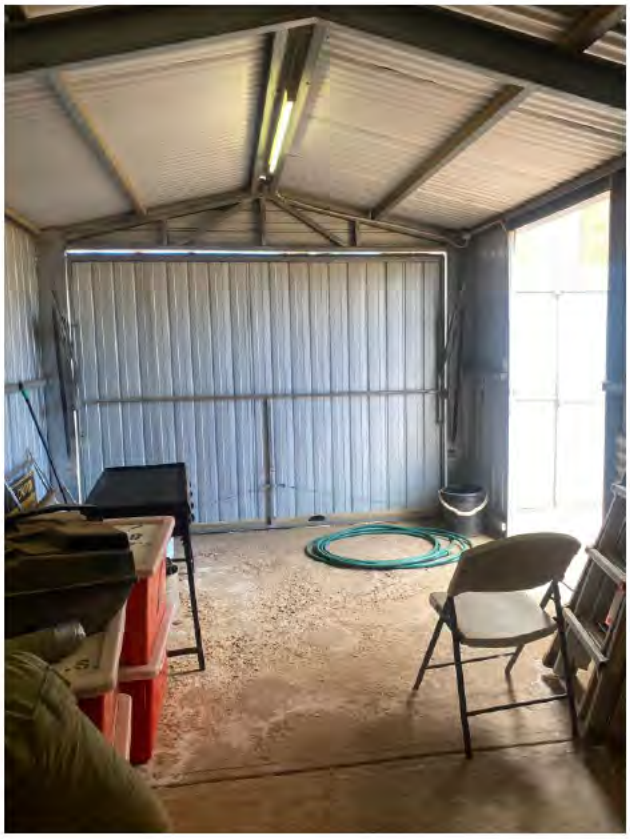
ID	Description	Photograph
6	**Facing:** S **Description:** Rear yard which backs onto rail line used for freight trains	
7	**Facing:** N **Description:** Eastern side of station	

ID	Description	Photograph
8	**Facing:** SW **Description:** Rear yard	
9	**Facing:** S **Description:** Western side of station, including truck washdown area and storage shed	

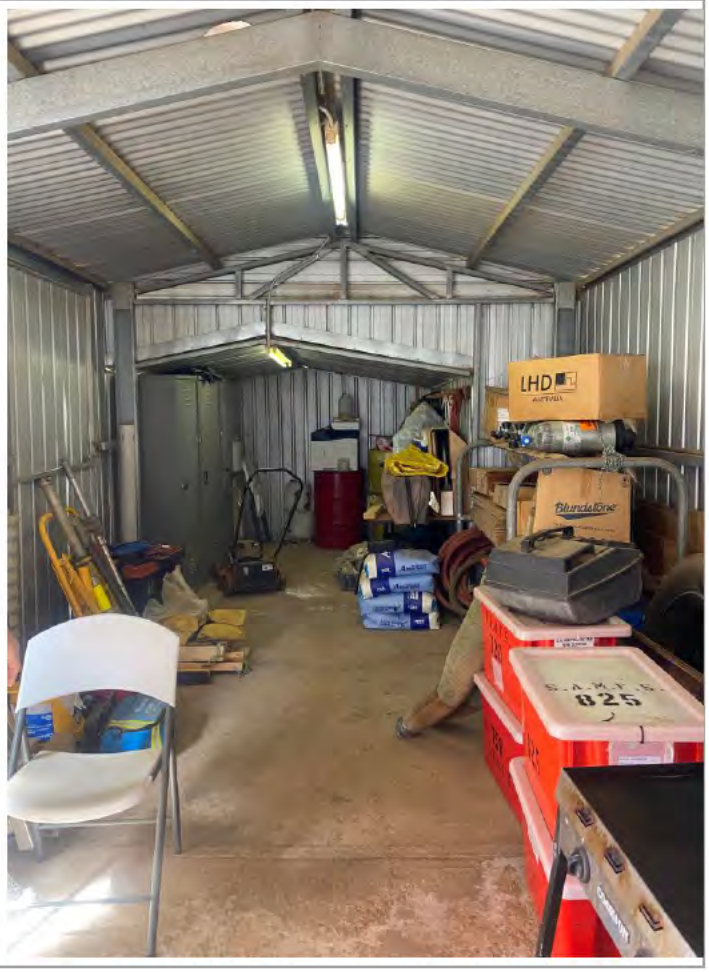
ID	Description	Photograph
10	**Facing:** N **Description:** Inside engine room looking out to front apron	
11	**Facing:** E **Description:** Front apron surface, visible cracking	

ID	Description	Photograph
12	**Facing:** **Description:** Concrete hardstand by storage shed, visible cracking	
13	**Facing:** **Description:** Concrete hardstand in truck washdown area, visible cracking	

ID	Description	Photograph
14	**Facing:** S **Description:** Rear yard access gate on western side of main building	
15	**Facing:** S **Description:** Concrete hardstand area of rear yard	

ID	Description	Photograph
16	**Facing:** S **Description:** Rear yard	
17	**Facing:** N **Description:** Inside storage shed	

ID	Description	Photograph
18	**Facing:** S **Description:** Inside storage shed	
19	**Facing:** **Description:** Chemicals stored on-site	

ID	Description	Photograph
20	**Facing:** W **Description:** Inside storage shed	
21	**Facing:** S **Description:** Inside storage shed	

ID	Description	Photograph
22	**Facing:** **Description:** Chemicals stored on-site	
23	**Facing:** E **Description:** Open stormwater drain north of the station, captures stormwater from the town and transports west to dam	

ID	Description	Photograph
24	**Direction:** W **Description:** Dam west of station which receives stormwater from the town	

Appendix C

MFS Surveys

MFS Station – AFFF Historical Use Questionnaire

Please distribute the following questionnaire to nominated MFS personnel who have worked at MFS sites when active use of AFFF ***(aqueous film-forming foam, firefighting foam)*** occurred before it was phased out in 2016. When applicable, please annotate key site features on the site plans attached at the end of this questionnaire.

MFS Station: Peterborough SAMFS Fire Station

Name: [redacted]

Position when working at the site:

Phone number: [redacted] **Email:** [redacted]

Date of response: 28/6/2022

Item	Question	Response
1	*When did you start working at this station?*	december 1992
2	*How long have you worked at this station?*	29 years
3	*Can you describe where stormwater from the site is usually discharged to (e.g. stormwater pit, nearby creek / pond, street gutter)?*	backyard lawn and street gutter
4	*Can you describe any changes in how stormwater has been managed at the site over time?*	no changes
5	*Is stormwater harvested within the site?*	no
5.1	*If yes, please describe where and how stormwater is harvested.*	
5.2	*For what purposes is stormwater harvested?*	
6	*Are there groundwater wells / bores at the site?*	no
6.1	*If yes, for what purpose is groundwater used at the site?*	

Item	Question	Response
6.2	*Where are the groundwater well / bores located on site? Please mark the location on the attached site plan.*	
7	*Date when AFFF was first used on site?*	unknown - I think it was in use when I started
8	*Can you provide the product names of any AFFF used on the site? (e.g. Ansulite, 3M Light Water)*	3M was one, not sure if any other brands were used
9	*Was AFFF used in regular training exercises?* *If so:*	yes
9.1	*How often was the training?* *(e.g. weekly, monthly, quarterly)*	approx quareterly, however we used to conduct extinguisher training for community groups in the early days
9.2	*Can you describe the location of the training areas and annotate them on the site plan?*	backyard - lawn area / driveway
9.3	*Can provide an estimate of how much AFFF was used in each training?*	20 litres each time
9.4	*Was the training ground sealed / open?*	open
9.5	*Was AFFF dispersed aerially?* *If so, please indicate the maximum extent on the site plan?*	via foam branch
9.6	*When was the date of the last training event that included the use of AFFF?*	unknown, when it was removed from service. Just prior to 2016
10	*Please describe how the waste water was managed following training events?* *Specifically, was there a recycling system, storage pond, storage tanks or drains?* *Please annotate waste water discharge point / pathways on the site plan.*	via normal ground contours to street stomwater
11	*Did any waste water flow into drains that directed the waste water off-site?* *Please annotate the waste water discharge points / pathways on the site plan.*	no
12	*Were there any changes how the waste water was managed over time?* *If so, please describe the changes.*	no
13	*Is there any inventory of AFFF use for the site?*	no

Item	Question	Response
14	*Can you estimate the total volume of AFFF used on site before it was phased out in 2016?*	unknown
15	*Where was AFFF stored on site?* *Please annotate the storage location on the site plan.*	yes the site storage shed
15.1	*What type and size of storage containers were used to store AFFF on site?*	plastic 20 litre drums
15.2	*What is the number of storage containers or the total volume of AFFF that was typically stored on site at any given time prior to 2016?*	10
16	*Please describe where and how AFFF was transferred from storage containers to the fire trucks / fire-fighting appliances.* *What equipment was used to transfer the AFFF?*	firefighters pouring into the top of the foam tank when required - manual labour Funnel - foam pickup tube -
17	*How were spent drums of AFFF disposed of?*	washed out and disposed in general rubbish
18	*Were there any wash down areas for fire trucks, equipment or AFFF containers?* *If so:*	only the lawn at the rear of the station
18.1	*How was the waste water from such areas managed? (e.g. recycling, treatment, storage pond or discharge to drains)*	Natural evapouration - natural water runoff, no formal management plan
18.2	*Were there any changes how the waste water was managed over?* *If so, please describe the changes.*	no
19	*Please describe / annotate the specific location(s) of any other chemical storage facilities (including fuel and oil) and describe the type and typical use of those chemicals.*	shed - diesel jerry cans in the early days, as there is no 24 hour fuel stations in or around Peterborough
20	*Is there an incident log / register for the site?*	only fire reports

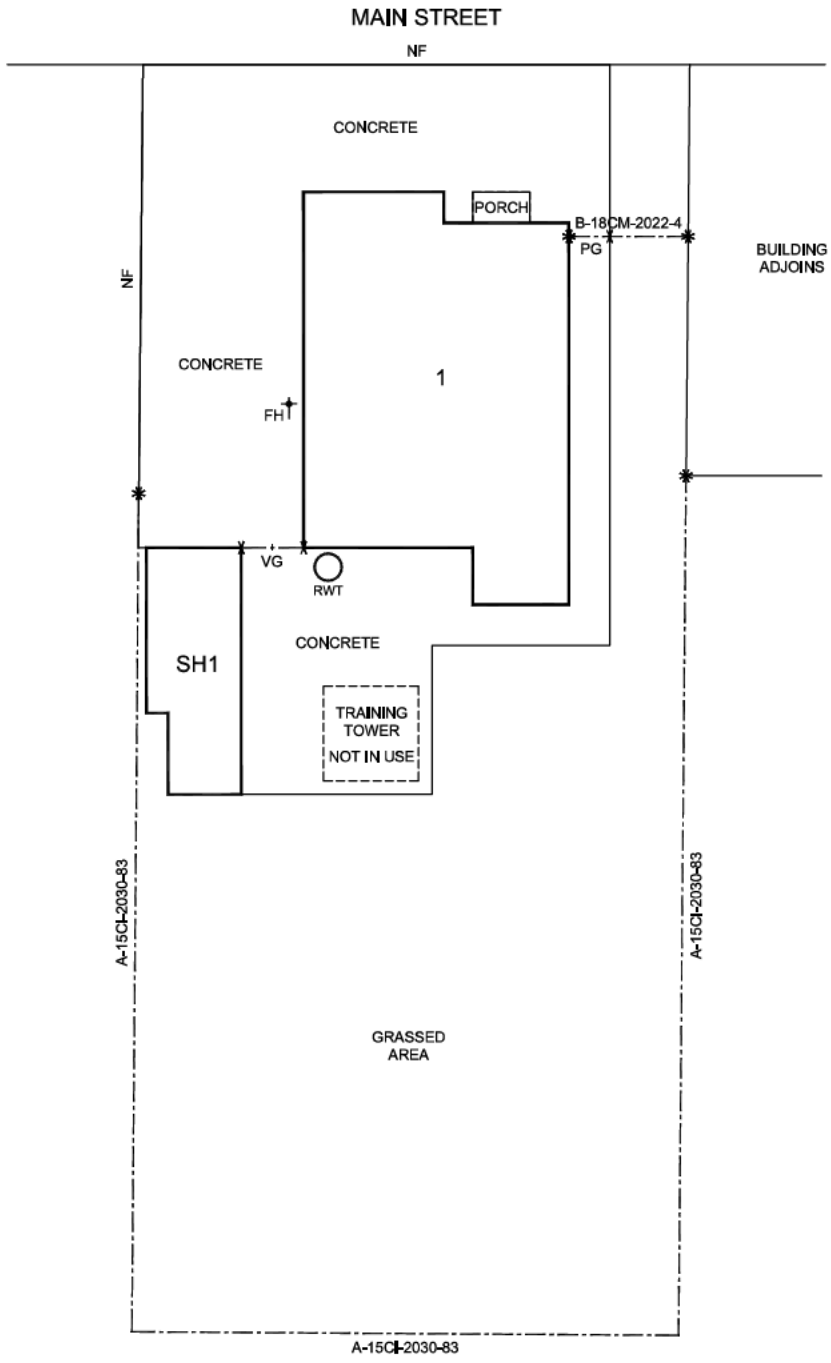
Item	Question	Response
21	*Are you aware of any AFFF (or other chemical) releases that may have occurred outside of typical application scenarios? If so:*	no
21.1	*When did such release(s) happen?*	
21.2	*What substance(s) was/were released?*	
21.3	*Where did such release(s) happen?* *Please annotate the release point(s) on the site plan.*	
21.4	*Where was the released AFFF or chemical discharged to?* *Please annotate the discharge point(s) on the site plan.*	lawn area backyard
22	*Are there areas of the site where training activities and / or AFFF release(s) have historically occurred that are now unused or have been built on?*	yes where the storage shed sits
23	*Have there been any significant bulk earthworks on the Station site that resulted in soil being relocated from one area to another?*	yes - when the side of the station was cemented there was soil that was removed. It was found that there was a leak in the roof downpipe and soil had to be removed and replaced with dry soil to compact for cementing
24	*Please describe any changes to the Station that you are aware of with respect to the storage and use of AFFF.*	nil

Any other comments or notes.

Scale Bar Units In Metres (1:200) Plot at a scale of 1=0.2 All dimensions to be verified on site

10 20 30 40 50

NORTH



BUILDINGS

1 FIRE STATION

SH1 GALV. IRON STORE SHED

FENCES	code-height-type-fail date-length (ms)	
CI corrugated iron		PW post and wire
CM chain mesh		WM weld mesh
GT galtube		NF not fenced
PG pedestrian gate		VG vehicle gate
WM Water Meter		Fence junction
GM Gas Meter		PMT Pad mtd trans

PETERBOROUGH SAMFS FIRE STATION 86 MAIN STREET PETERBOROUGH 5422

Government of South Australia
Department for Transport, Energy and Infrastructure

Asset no.	09186	Client.	ODEPT
DTEI Office.	PT PIRIE	Sheet.	1 of 1
Created by.	[redacted]		May 2010
Modified by.	-	-	-
Audited by.	[redacted]		May 2010
Title details.	refer layer " site-allotment " CT-2409/13		
Site area.	0.0944 ha	Accuracy.	site survey

Strategic Asset Management Information System Plan

SAMIS 09186

Appendix D

Borehole Logs

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH01

Client MFS
Project MFS Peterborough DSI
Project No. 12616806
Site Peterborough Fire Station
Location 86 Main Street
Date Drilled 24/09/2023

Drill Co. WBD Drilling Pty. Ltd.
Driller WBD Drilling Pty. Ltd.
Rig Type Eziprobe
Total Depth (m) 3.00
Diameter (mm) 50

Easting 298247.2209
Northing 6349605.114
Grid Ref GDA2020_MGA_zone_54
Logged By AK
Checked By TD

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Depth (m)
	DC					CONCRETE			No odour; No staining	
0.2	PT					Clayey SAND low to medium plasticity, medium, poorly graded, brown and white, with medium to coarse gravel, subangular, coarse gravel (FILL)	D	MD	No odour; No staining	0.2
0.4			BH01_0.5							0.4
0.6						Gravelly SAND fine to medium, poorly graded, brown, some silt (FILL)	D	MD	No odour; No staining	0.6
0.8										0.8
1										1
1.2										1.2
1.4										1.4
1.6										1.6
1.8										1.8
2			BH01_2.0			Clayey SAND fine to medium, poorly graded, brown, and rock fragments (NATURAL - SOIL)	D	D	No odour; No staining	2
2.2										2.2
2.4										2.4
2.6										2.6
2.8										2.8
3						Termination Depth at:3.00 m. Borehole collapse.				3
3.2										3.2

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH03

Client MFS
Project MFS Peterborough DSI
Project No. 12616806
Site Peterborough Fire Station
Location 86 Main Street
Date Drilled 24/09/2023

Drill Co. WBD Drilling Pty. Ltd.
Driller WBD Drilling Pty. Ltd.
Rig Type Eziprobe
Total Depth (m) 4.50
Diameter (mm) 50

Easting 298263.8878
Northing 6349606.776
Grid Ref GDA2020_MGA_zone_54
Logged By AK
Checked By TD

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Depth (m)
0	HA		BH03_0.1			TOPSOIL/GRASSMAT				0
0.2						SAND medium, poorly graded, brown and white, with medium to coarse gravel, subangular, coarse gravel	D	L		0.2
0.4	PT					Silty SAND fine to medium, poorly graded, brown, with rock fragments (FILL)	D	MD	No odour; No staining	0.4
0.6										0.6
0.8										0.8
1										1
1.2						Silty SAND fine to medium, poorly graded, pale brown and white, and rock fragments (NATURAL - SOIL)	D	D	No odour; No staining	1.2
1.4			BH03_1.5							1.4
1.6										1.6
1.8										1.8
2										2
2.2										2.2
2.4										2.4
2.6										2.6
2.8										2.8
3										3
3.2						Sandy CLAY medium plasticity, fine to medium, brown with, some rock fragments (NATURAL - SOIL)	D	MD	No odour; No staining	3.2
3.4										3.4
3.6										3.6
3.8										3.8
4						Gravelly SAND fine to medium, poorly graded, brown, and rock fragments (NATURAL - SOIL)	D	MD	No odour; No staining	4
4.2										4.2
4.4										4.4
4.6						Termination Depth at:4.50 m. Refusal on bedrock.				4.6
4.8										4.8

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH04

Client MFS
Project MFS Peterborough DSI
Project No. 12616806
Site Peterborough Fire Station
Location 86 Main Street
Date Drilled 24/09/2023

Drill Co. WBD Drilling Pty. Ltd.
Driller WBD Drilling Pty. Ltd.
Rig Type Eziprobe
Total Depth (m) 4.30
Diameter (mm) 50

Easting 298264.3176
Northing 6349601.322
Grid Ref GDA2020_MGA_zone_54
Logged By AK
Checked By TD

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Depth (m)
	HA					GRASS				
0.2						SAND medium, poorly graded, brown and white, with medium to coarse gravel, subangular, coarse gravel (FILL)	D	L	No odour; No staining	0.2
0.4			BH04_0.5			Silty SAND fine to medium, poorly graded, brown, with rock fragments (NATURAL - SOIL)	D	MD	No odour; No staining	0.4
0.6	PT									0.6
0.8										0.8
1										1
1.2						Silty SAND fine to medium, poorly graded, pale brown and white, and rock fragments (NATURAL - SOIL)	D	D	No odour; No staining	1.2
1.4										1.4
1.6										1.6
1.8										1.8
2										2
2.2										2.2
2.4			BH04_2.5							2.4
2.6										2.6
2.8										2.8
3										3
3.2						Sandy CLAY medium plasticity, fine to medium, brown with, some rock fragments (NATURAL - SOIL)	D	F	No odour; No staining	3.2
3.4										3.4
3.6										3.6
3.8										3.8
4						Gravelly SAND fine to medium, poorly graded, brown, and rock fragments (NATURAL - SOIL)	D	MD	No odour; No staining	4
4.2										4.2
4.4						Termination Depth at:4.30 m. Refusal on bedrock.				4.4
4.6										4.6

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH05

Client MFS
Project MFS Peterborough DSI
Project No. 12616806
Site Peterborough Fire Station
Location 86 Main Street
Date Drilled 22/09/2023

Drill Co. WBD Drilling Pty. Ltd.
Driller WBD Drilling Pty. Ltd.
Rig Type Eziprobe
Total Depth (m) 4.20
Diameter (mm) 50

Easting 298269.5592
Northing 6349586.495
Grid Ref GDA2020_MGA_zone_54
Logged By AK
Checked By TD

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Depth (m)
	HA					GRASS				
0.2						SAND medium, poorly graded, brown and white, with medium to coarse gravel, subangular, coarse gravel (FILL)	D	L	No odour; No staining	0.2
0.4			BH05_0.5			Silty SAND fine to medium, poorly graded, brown, with rock fragments (FILL)	D	MD	No odour; No staining	0.4
0.6	PT									0.6
0.8										0.8
1										1
1.2						Silty SAND fine to medium, poorly graded, pale brown and white, and rock fragments (NATURAL - SOIL)	D	D	No odour; No staining	1.2
1.4										1.4
1.6										1.6
1.8										1.8
2										2
2.2										2.2
2.4			BH05_2.5							2.4
2.6										2.6
2.8										2.8
3										3
3.2						Sandy CLAY medium plasticity, fine to medium, brown with, some rock fragments (NATURAL - SOIL)	D	F	No odour; No staining	3.2
3.4										3.4
3.6										3.6
3.8										3.8
4						Gravelly SAND fine to medium, poorly graded, brown, and rock fragments (NATURAL - SOIL)	D	MD	No odour; No staining	4
4.2						Termination Depth at:4.20 m. Refusal on bedrock.				4.2
4.4										4.4

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH06

Client MFS
Project MFS Peterborough DSI
Project No. 12616806
Site Peterborough Fire Station
Location 86 Main Street
Date Drilled 22/09/2023

Drill Co. WBD Drilling Pty. Ltd.
Driller WBD Drilling Pty. Ltd.
Rig Type Eziprobe
Total Depth (m) 4.20
Diameter (mm) 50

Easting 298269.5592
Northing 6349586.495
Grid Ref GDA2020_MGA_zone_54
Logged By AK
Checked By TD

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Depth (m)
	HA					GRASS				
0.2						SAND medium, poorly graded, brown and white, with medium to coarse gravel, subangular, coarse gravel (FILL)	D	L	No odour; No staining	0.2
0.4			BH06_0.5			Silty SAND fine to medium, poorly graded, brown, with rock fragments (NATURAL - SOIL)	D	MD	No odour; No staining	0.4
0.6	PT									0.6
0.8										0.8
1										1
1.2						Silty SAND fine to medium, poorly graded, pale brown and white, and rock fragments (NATURAL - SOIL)	D	D	No odour; No staining	1.2
1.4										1.4
1.6										1.6
1.8										1.8
2										2
2.2										2.2
2.4										2.4
2.6										2.6
2.8										2.8
3										3
3.2						Sandy CLAY medium plasticity, fine to medium, brown with, some rock fragments (NATURAL - SOIL)	D	F	No odour; No staining	3.2
3.4			BH06_3.5							3.4
3.6										3.6
3.8										3.8
4						Gravelly SAND fine to medium, poorly graded, brown, and rock fragments (NATURAL - SOIL)	D	MD	No odour; No staining	4
4.2						Termination Depth at:4.20 m. Refusal on bedrock.				4.2
4.4										4.4

Notes

This log is not intended for geotechnical purposes.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-GROUNDWATER

MONITORING WELL MW01

Client MFS
Project MFS Peterborough DSI
Project No. 12616806
Site Peterborough Fire Station
Location 86 Main Street
Date Drilled 23/09/2023

Drill Co. WBD Drilling Pty. Ltd.
Driller WBD Drilling Pty. Ltd.
Rig Type Eziprobe
Drill Method
Total Depth (m) 15.00
Casing Diameter (mm) 50

Easting, Northing 298263.051, 6349601.751
Grid Ref GDA2020_MGA_zone_54
Elevation 531.838
TOC mAHD 531.739
Logged By AK
Checked By TD

B.C.L No. 448575 **Casing** 50 mm PVC (Class 18) **Screen** 0.5mm Slotted PVC (Class 18) **Surface Completion** Gatic

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Well Details	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0	HA						GRASS	D	L	No odour; No staining	
							SAND medium, poorly graded, brown and white, with medium to coarse gravel, subangular, coarse gravel (FILL)	D	MD	No odour; No staining	531.5
0.5			MW01_0.5				Silty SAND fine to medium, poorly graded, brown, with rock fragments (NATURAL - SOIL)				
1	PT										531
1.5							Silty SAND fine to medium, poorly graded, brown and white, and rock fragments (NATURAL - SOIL)	D	D	No odour; No staining	530.5
2											530
2.5											529.5
3											529
3.5					Grout						528.5
4							Sandy CLAY medium plasticity, fine to medium, brown with mottled grey, some rock fragments (NATURAL - SOIL)	SM	ST	No odour; No staining	528
							Gravelly SAND fine to medium, poorly graded, brown, and rock fragments (NATURAL - SOIL)	D	MD	No odour; No staining	527.5
4.5			MW01_4.5					SM	ST	No odour; No staining	
5							Sandy CLAY medium plasticity, fine to medium, poorly graded, brown with mottled grey, some rock fragments (NATURAL - SOIL)				527
5.5											526.5
6							SILT low plasticity, blue- grey with mottled yellow, some clay (possible NATURAL - BEDROCK)	D	MD	Silt stone?	526
6.5							Clayey SILT low plasticity, mottled yellow- grey (possible NATURAL - BEDROCK)	D		Silt stone?	525.5
7							Clayey SILT low plasticity, grey with mottled yellow (possible NATURAL - BEDROCK)	D			525
								D			

Notes

This log is not intended for geotechnical purposes. Hollow triangle symbolises water strike, solid triangle symbolises recovered water level.

Drilling Abbreviations

AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, RB-Rotary Blade, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler

Moisture Abbreviations

D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated

Consistency Abbreviations

Granular Soils VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense

Cohesive Soils VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-GROUNDWATER

MONITORING WELL MW01

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Well Details	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
7.5					Grout		Clayey SILT low plasticity, yellow with mottled grey (possible NATURAL - BEDROCK)				524.5
8											524
8.5											523.5
9											523
9.5							Clayey SILT low plasticity, yellow (possible NATURAL - BEDROCK)	D			522.5
10	SFA										522
10.5					Bentonite						521.5
11											521
11.5											520.5
12											520
12.5											519.5
13					Sand						519
13.5											518.5
14											518
14.5											517.5
15											517
15.5							Termination Depth at:15.00 m. Target depth achieved.				516.5

Notes

This log is not intended for geotechnical purposes. Hollow triangle symbolises water strike, solid triangle symbolises recovered water level.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, RB-Rotary Blade, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-GROUNDWATER

MONITORING WELL MW02

Client MFS	**Drill Co.** WBD Drilling Pty. Ltd.	**Easting, Northing** 298261.564, 6349587.21
Project MFS Peterborough DSI	**Driller** WBD Drilling Pty. Ltd.	**Grid Ref** GDA2020_MGA_zone_54
Project No. 12616806	**Rig Type** Eziprobe	**Elevation** 531.86
Site Peterborough Fire Station	**Drill Method**	**TOC mAHD** 531.772
Location 86 Main Street	**Total Depth (m)** 15.00	**Logged By** AK
Date Drilled 22/09/2023	**Casing Diameter (mm)** 50	**Checked By** TD

B.C.L No. 448573 **Casing** 50 mm PVC (Class 18) **Screen** 0.5mm Slotted PVC (Class 18) **Surface Completion** Gatic

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Well Details	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0	HA				MW02		GRASS	D	L	No odour; No staining	
							SAND medium, poorly graded, brown and white, with medium to coarse gravel, subangular, coarse gravel (FILL)	D	MD	No odour; No staining	531.5
0.5			MW02_0.5								
							Silty SAND fine to medium, poorly graded, brown, with rock fragments (NATURAL - SOIL)				531
1	PT										
							Silty SAND fine to medium, poorly graded, brown and white, and rock fragments (NATURAL - SOIL)	D	D	No odour; No staining	530.5
1.5											
2											530
2.5											529.5
3											529
3.5					Grout						528.5
4							Sandy CLAY medium plasticity, fine to medium, brown with mottled grey, some rock fragments (NATURAL - SOIL)	SM	F	No odour; No staining	528
							Gravelly SAND fine to medium, poorly graded, brown, and rock fragments (NATURAL - SOIL)	D	MD	No odour; No staining	527.5
4.5								SM	MD	No odour; No staining	
5							Sandy CLAY medium plasticity, fine to medium, poorly graded, brown with mottled grey, some rock fragments (NATURAL - SOIL)				527
5.5			MW02_5.5								526.5
6							SILT low plasticity, blue- grey with mottled yellow, some clay (possible NATURAL - BEDROCK)	D	MD	Silt stone; No odour; No staining	526
6.5							Clayey SILT low plasticity, mottled yellow- grey (possible NATURAL - BEDROCK)	D	F	Silt stone; No odour; No staining	525.5
7							Clayey SILT low plasticity, grey with mottled yellow (possible NATURAL - BEDROCK)	D	F	Silt stone; No odour; No staining	525
								D	F	Silt stone; No odour; No staining	

Notes

This log is not intended for geotechnical purposes. Hollow triangle symbolises water strike, solid triangle symbolises recovered water level.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, RB-Rotary Blade, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-GROUNDWATER

MONITORING WELL MW02

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	MW02 Well Details	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
7.5							Clayey SILT low plasticity, yellow with mottled grey (possible NATURAL - BEDROCK)			staining	524.5
8											524
8.5											523.5
9					Grout						523
9.5							Clayey SILT low plasticity, yellow (possible NATURAL - BEDROCK)	D	F	Silt stone; No odour; No staining	522.5
10	SFA										522
10.5					Bentonite						521.5
11											521
11.5											520.5
12											520
12.5											519.5
13					Sand						519
13.5											518.5
14											518
14.5											517.5
15											517
15.5							Termination Depth at:15.00 m. Target depth achieved.				516.5

Notes

This log is not intended for geotechnical purposes. Hollow triangle symbolises water strike, solid triangle symbolises recovered water level.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, RB-Rotary Blade, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-GROUNDWATER

MONITORING WELL MW03

Client MFS
Project MFS Peterborough DSI
Project No. 12616806
Site Peterborough Fire Station
Location 86 Main Street
Date Drilled 23/09/2023

Drill Co. WBD Drilling Pty. Ltd.
Driller WBD Drilling Pty. Ltd.
Rig Type Eziprobe
Drill Method
Total Depth (m) 14.00
Casing Diameter (mm) 50

Easting, Northing 298275.012, 6349596.238
Grid Ref GDA2020_MGA_zone_54
Elevation 531.863
TOC mAHD 531.77
Logged By AK
Checked By TD

B.C.L No. 448574 **Casing** 50 mm PVC (Class 18) **Screen** 0.5mm Slotted PVC (Class 18) **Surface Completion** Gatic

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	Well Details	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
0	HA				MW03		GRASS	D	L	No odour; No staining	531.8
0.5			MW03_0.5				SAND medium, poorly graded, brown and white, with medium to coarse gravel, subangular, coarse gravel (FILL)	D	MD	No odour; No staining	531.3
1	PT						Silty SAND fine to medium, poorly graded, brown, with rock fragments (NATURAL - SOIL)				531
1.5							Silty SAND fine to medium, poorly graded, brown and white, and rock fragments (NATURAL - SOIL)	D	D	No odour; No staining	530.3
2											530
2.5											529.3
3			MW03_3.0								529
3.5	SFA				Grout						528.3
4											528
4.5											527.3
5											527
5.5											526.3
6											526
6.5											525.3
7											525

Notes

This log is not intended for geotechnical purposes. Hollow triangle symbolises water strike, solid triangle symbolises recovered water level.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, RB-Rotary Blade, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

BOREHOLE LOG

ENVIRONMENTAL-GROUNDWATER

MONITORING WELL MW03

Depth (m)	Drilling Method	PID (ppm)	Sample ID	Water	MW03 Well Details	Graphic Log	LITHOLOGICAL DESCRIPTION Soil Type (Classification Group Symbol); Particle Size; Colour; Secondary / Minor Components.	Moisture	Consistency	COMMENTS/ CONTAMINANT INDICATORS Odours, staining, waste materials,separate phase liquids, imported fill, ash.	Elevation (m)
7.5											524.5
8											524
8.5					Grout						523.5
9											523
9.5											522.5
10											522
10.5					Bentonite						521.5
11											521
11.5											520.5
12											520
12.5					Sand						519.5
13											519
13.5											518.5
14							Termination Depth at:14.00 m. Target depth achieved.				518
14.5											517.5
15											517

Notes

This log is not intended for geotechnical purposes. Hollow triangle symbolises water strike, solid triangle symbolises recovered water level.

Drilling Abbreviations	Moisture Abbreviations	Consistency Abbreviations	
AH-Air Hammer, AR-Air Rotary, BE-Bucket Excavation, CC-Concrete Coring, DC-Diamond Core, FH-Foam Hammer, HA-Hand Auger, HE-Hand Excavation (shovel), HFA-Hollow Flight Auger, MR-Mud Rotary, NDD-Non Destructive Drilling, PT-Pushtube, RB-Rotary Blade, SD-Sonic Drilling, SFA-Solid Flight Auger, SS-Split Spoon, WB-Wash Bore, WS-Window Sampler	D-Dry, SM-Slightly Moist, M-Moist, VM-Very Moist, W-Wet, S-Saturated	**Granular Soils** VL-Very Loose, L-Loose, MD-Medium Dense, D-Dense,VD - Very Dense	**Cohesive Soils** VS-Very Soft, S-Soft, F-Firm, ST-Stiff, VST-Very Stiff, H-Hard

Appendix E

SSHIL Methodology

Crown Tower, Level 11, 200 Crown Street
Wollongong, New South Wales 2500
Australia
www.ghd.com

Our ref: 12602101

28 June 2023

Krystle Mitchell
Senior Scientific and Environment Officer
South Australian Metropolitan Fire Service
99 Wakefield Street
Adelaide, SA 5000

Derivation of site-specific health investigation levels for urban and regional fire stations – South Australia Metropolitan Fire Service (SA MFS)

Dear Krystle,

1. Introduction

This letter describes the derivation of site-specific health investigation levels (SSHILs) for per- and poly-fluoroalkyl substance (PFAS) contaminated soil at fire stations operated by the South Australia Metropolitan Fire Service (SA MFS). SSHILs have been derived for urban and regional settings based on the methodology provided in the following documents: .

- Heads of EPAs Australia and New Zealand (HEPA) and the Australian Government Department of the Environment and Energy (DoEE) – *PFAS National Environmental Management Plan* (the 'PFAS NEMP') (HEPA, 2020)
- National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended 2013 (NEPC, 2013) (the 'ASC NEPM')
- NSW and Office of Environment and Heritage (OEH, 2019) *Human health soil screening criteria for PFOS, PFHxS and PFOA*

1.1 Background

From 2007, SA MFS began phasing out the use of aqueous film-forming foam (AFFF) containing perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) as key constituents, due to concerns regarding the hazards posed by these compounds to human health and the environment. The SA MFS replaced all firefighting foam in 2016 to ensure that only fluorine-free foam was in use. Currently, state-wide, all SA MFS appliances carry firefighting foams that do not contain PFOS or PFOA and are fluorine-free. During 2017/2018, the SA MFS also removed all fire extinguishers containing PFAS. In 2018, SA MFS engaged GHD to provide ongoing environmental services and undertake site contamination assessments across many of their operational sites as well as risk profiling for their entire portfolio of sites to effectively manage the potential for PFAS contamination and any associated human health and ecological risks.

The PFAS NEMP provides generic health investigation levels (HILs) for PFOS, PFOA and perfluorohexane sulfonate (PFHxS) in soil in four land use settings, as summarised in Table 1 below. The land use settings considered in the PFAS NEMP are consistent with those that underpin the HILs presented for a variety of contaminants within the ASC NEPM. The derivation of the PFAS HIL values is described in detail by OEH (2019).

Table 1 Summary of exposure scenarios adopted to derive generic HILs.

Land use	HIL (mg/kg)	Exposure scenario description
HIL A Residential, with gardens /accessible soil	PFOS+PFHxS: 0.01 PFOA: 0.1	- Low-density residential settings with sizeable gardens and with areas of soil that are accessible - Gardens are assumed to consist of lawns, garden beds and small vegetable gardens and areas of fruit trees - Assumes home-grown produce provides up to 10% of fruit and vegetable intake (does not account for consumption of eggs from home poultry) - Site users are adults, children and infants who spend most of their time at home and use the outdoor areas of the residences on a frequent basis for activities such as gardening or recreation. This scenario assumes 20 hours a day spent indoors and 4 hours a day spent outdoors in direct contact with soil. - Children are the most sensitive human receptors. This scenario is protective of childcare centres, kindergartens, preschools and primary schools and their integral playgrounds.
HIL B Residential, with minimal opportunities for soil access	PFOS+PFHxS: 2 PFOA: 20	- High-density residential settings, such as unit blocks, where communal outdoor spaces are largely covered by permanent paving and with some small areas of landscaping or lawns - Assumes that there are minimal opportunities for direct access to soil by residents. There may be some potential for residents to inhale, ingest or come into direct dermal contact with dust particulates derived from the on-site soil. - Assumes no use of soil to produce vegetables, fruit or poultry - Site users are adults, children and infants who spend most of their time indoors with limited use of communal outdoor areas on site. This scenario assumes 20 hours a day spent indoors and 1 hour a day spent outdoors in direct contact with soil. - Children are the most sensitive human receptors
HIL C Public open space	PFOS+PFHxS: 1 PFOA: 10	- Parks, playgrounds, recreational areas and playing fields that are fully accessible to the public - These areas may contain lawns, gardens, vegetated areas, and walkways with some areas of exposed soil - Assumes no use of soil to produce vegetables, fruit or poultry - Site users are adults and children who may use the area for up to 2 hours a day, 7 days a week - Children are the most sensitive human receptors
HIL D Commercial/ industrial	PFOS+PFHxS: 20 PFOA: 50	- Commercial and/or industrial settings where the outdoor areas are largely (80%) covered by hardstand, possibly with some limited areas of landscaping or lawns - Site users are adult employees that spend up to 8 hours a day indoors and 1 hour a day outdoors for up to 240 days per year - There are minimal opportunities for direct access to soil. There is the potential for employees to inhale, ingest or come into direct contact with dust particulates derived from the soil on the site.

A review of Table 1 indicates that the typical usage patterns at SA MFS fire stations most closely align with the exposure assumptions that underpin the HIL D values. The following inconsistencies are however noted:

– The preliminary site investigations undertaken at SA MFS sites across South Australia has identified that some fire stations have a higher proportion of unsealed ground (up to approximately 75% of the total site area) than has been assumed in the derivation of the HIL D values (up to approximately 20% of the total site area). As a result of this, there may be greater opportunities for direct access to soil at SA MFS fire stations, including the ingestion of soil and soil-derived dust.

– The shifts worked by SA MFS firefighters do not align with the assumption of a standard working week than underpins the HIL D values

Given these factors, SSHILs have been derived using exposure assumptions that reflect the typical usage pattern of the SA MFS fire stations, to allow for a more accurate assessment of the health risks that may be associated with the presence of PFAS in shallow soils.

1.2 Objective of this report

The objective of this report is to derive SSHILs for PFOS+PFHxS and PFOA in soils that are protective of workers at SA MFS fire stations in typical urban and regional settings. The purpose of these SSHILs is to facilitate the screening assessment of soil datasets for human health risks.

2. Derivation methodology

The SSHILs have been calculated using the HILs spreadsheet (Excel format) provided on the ASC NEPM website[1]. The algorithms underlying the HILs spreadsheet are detailed in Schedule B7 of the ASC NEPM. These algorithms were also used in the derivation of the HILs PFOS+PFHxS and PFOA, presented in Table 1 and as detailed by OEH (2019).

The process used to derive the SSHILs involved the following key steps:

- ***Toxicity assessment:*** which established the relationships between PFAS exposure and potential health and ecological effects, using published toxicological information
- ***Exposure assessment:*** which produced estimates of the PFAS exposure that may be experienced by users of SA MFS fire stations.
- ***Risk characterisation:*** which combines the results of the toxicity assessment and exposure assessment, to derive soil criteria that are protective of potential risks to the health of users of SA MFS fire stations.

The toxicity assessment and exposure assessment inputs used in the derivation of the SSHILs are detailed herein, with the SSHILs provided in Section 3.

2.1 Toxicity assessment methodology

A toxicity assessment determines whether human exposure to a chemical could cause an increase in the incidence of an adverse health condition (NEPC, 2013). The outcomes of the toxicity assessment process are a set of toxicity criteria that have been used to derive the SSHILs.

For most chemicals there is a dose below which no adverse health effect will occur (i.e., a threshold toxicant). PFAS have been linked with several threshold toxicities, including effects on cholesterol and immunotoxicity. Accordingly, the SSHILs focus on potential threshold risks linked to PFAS exposure. Chronic health risks for threshold chemicals are assessed by comparing the estimated intake with toxicity reference values (TRVs), which are a measure of tolerable daily exposure. The TRVs adopted in the derivation of the SSHILs are consistent with those that underpin the HIL D values presented in the PFAS NEMP, as detailed in Table 2.

The toxicity assessment process also considers the toxicokinetics of PFAS and in particular the tendency of PFAS to be absorbed via the various potential routes of exposure (i.e., ingestion, inhalation and dermal absorption). Consistent with the approach adopted by OEH (2019) the dermal uptake of PFAS has been assumed to be negligible and has not been included in the derivation of the SSHILs.

[1] **https://www.nepc.gov.au/nepms/assessment-site-contamination/toolbox**

Table 2 Summary of toxicological input parameters used in the derivation of the SSHILs.

Chemical	Toxicity assessment input parameters	Source
Toxicity reference values		
PFOS, PFHxS (sum)	20 ng/kg/day	OEH (2019); FSANZ (2017)
PFOA	160 ng/kg/day	OEH (2019); FSANZ (2017)
Absorption parameters		
Dermal absorption	Negligible	OEH (2019)
Gastrointestinal absorption	100%	OEH (2019); FSANZ (2017)

2.2 Exposure assessment methodology

In an exposure assessment, appropriate exposure assumptions are identified for each exposure pathway, and these are used in conjunction with exposure modelling algorithms to estimate intakes of contaminants by the exposed receptors (NEPC, 2013).

The exposure assessment inputs adopted in the derivation of the SSHILs have primarily been sourced from OEH (2019), with adjustments made as appropriate, based on information provided by SA MFS. A summary of the adopted exposure assessment inputs and the rational underpinning the selected values is provided in Attachment 1. These inputs can be summarised as follows:

- *Firefighter physiology*: The ASC NEPM Schedule B7 provides standard exposure parameters for commercial / industrial scenarios, including factors such as the body weight and inhalation characteristics of adult workers. Consistent with the approach adopted by OEH (2019), these have been adopted in the derivation of SSHILs, as SA MFS firefighters will typically be physiologically consistent with the general population.
- *Exposure frequency and time onsite*: Information provided by SA MFS has been used to select appropriate input assumptions around exposure frequency and time spent onsite, as detailed in Section 2.2.1
- *Exposure to PFAS from external sources*: PFAS is present in a variety of domestic products and commercial applications and is ubiquitous in urban settings. Hence, SA MFS firefighters are likely to be exposed to PFAS from a variety of sources external to the fire stations, such as food, air, water and consumer products. The TRVs detailed in Section 2.1 are relevant to the PFAS intake from all sources. The HIL D presented in the PFAS NEMP were derived based on the conservative assumption that 80% of the exposure to PFAS experienced by workers originates from external sources, with 20% of the TRV allocated to PFAS in fire station soils. This conservative assumption has been retained in the derivation of SSHILs for SA MFS firefighters
- *Incidental soil ingestion rates*: The incidental soil ingestion rates for SA MFS firefighters have been assumed to be consistent with those experienced by adults in a residential setting (50 mg/day), rather than those adopted in the ASC NEPM and by OEH (2019) for commercial/industrial sites (25 mg/day). This approach is likely to be conservative but has been adopted to account for the extended shifts worked by firefighters in metropolitan areas and the substantial areas of unsealed ground that are present on some of the SA MFS fire stations.
- *Use of SA MFS fire stations by children*: Children have not been specifically included in the derivation of the SSHILs. It is understood that children do visit the SA MFS fire stations but that this does not occur with regularity. Hence, the SSHILs, which have been derived to be protective of firefighters employed at the fire stations, will also be adequately protective of the health children visiting less frequently.

– *Produce production and consumption*: Historically, produce gardens were present on a number of the SA MFS fire stations and it is understood that there was some concern that the time spent tending these gardens and consuming produce would be associated with increased levels of exposure to PFAS. In 2022 however, SA MFS issued a directive on advice from GHD and EPA that all fruit and vegetable plants be removed from fire stations and replaced with ornamental plants (refer to Attachment 2). Areas of ornamental landscaping are not inconsistent with the exposure assumptions underpinning the HIL D values and therefore adjustments to the exposure assumptions used to derive the SSHILs have not been made on this basis.

2.2.1 Firefighter shifts

As noted in Table 1, the generic HIL D values assume that workers spend up to 240 days a year at commercial/industrial sites: eight hours a day indoors and one hour a day outdoors. This is equivalent to a total yearly exposure of 2160 hours. Given that the shifts worked by firefighter in both urban and regional areas differ from this pattern, the specific exposure times provided by SA MFS have been adopted in the derivation of the SSHILs as follows:

– Metropolitan fire stations – SA MFS has indicated that firefighters typically work two 10-hour dayshifts and two 14-hours nightshifts followed by four days off work and that firefighters work for 6 months before taking 6 weeks of annual leave. This averages to 12-hour shifts for circa 150 days per year. This is equivalent to a total yearly exposure of 1800 hours, which is lower than the exposure assumption underpinning the generic HIL D values.
– Regional fire stations – SA MFS has indicated that firefighters can spend up to three hours a week at regional fire stations. This is equivalent to a total yearly exposure of 156 hours per year, which is substantially lower than the exposure assumption underpinning the generic HIL D.

3. Site-specific HILs for the screening of PFAS contaminated soils at SA MFS sites

The input parameters selected via the toxicity assessment and exposure assessment processes, as detailed in Sections 2.1 and 2.2 respectively, have been combined to calculate SSHILs for the screening of PFAS contaminated soils at SA MFS fire stations. The models used to calculate the SSHILs are presented in Attachment 3 and Table 3 summarises the derived SSHIL values.

Table 3 SSHILs derived for the screening of PFAS contaminated soil in urban and regional SA MFS fire stations

Fire station type	PFOS+PFHxS	PFOA*	Comment
Metropolitan	14 mg/kg	50 mg/kg	These SSHILs assumes four 12-hour shifts every eight days (i.e., four days at work and four days off)
Regional	40 mg/kg	50 mg/kg	These SSHILs assumes one 3-hour shift per week.
Notes: Although higher values were calculated using the toxicity and exposure assessment process, the SSHIL for PFOA has been set as 50 mg/kg in anticipation of the Stockholm Convention low content limit. This is consistent with the PFAS NEMP			

4. Closure

We trust that the information above is sufficient for SA MFS's purposes. Should you have any further questions on this document please do not hesitate to contact the undersigned.

Regards

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Senior Environmental Scientist
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Ben Petticrew
Technical Director
ben.petticrew@ghd.com

5. References

FSANZ. (2017). *Food Standards Australia New Zealand's (FSANZ) report on Perfluorinated Chemicals in Food.*

HEPA. (2020). *PFAS National Environmental Management Plan - Version 2.0* .

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Amendment Measure* .

OEH. (2019). *Human health soil screening criteria for PFOS, PFHxS and PFOA.*

Attachments

Attachment 1

Summary of exposure assessment inputs

Summary of SA MFS sites - unsealed areas

Location (metro)	Unsealed area (m^2)	Total area (m^2)	% unsealed
Angle park	111254	153034	73%
Adelaide	115	20000	1%
St Marys	1229	4543	27%
Largs	1163	3316	35%
Woodville	141	2172	6%
Christie Downs	710	2321	31%
Camden Park	531	2771	19%
Oakden	1302	4802	27%
Port Adelaide	449	4349	10%
O'Halloran Hill	2959	7300	41%
Brooklyn Park	1090	3710	29%
Beulah Park	335	2791	12%
Elizabeth	100	3256	3%
Gawler	1300	3457	38%
Glen Osmond	180	3152	6%
Golden Grove	1172	3994	29%
Paradise	680	4090	17%
Prospect	580	2820	21%
Salisbury	2442	12607	19%
Seaford	2300	7450	31%
Mount Barker	362	2110	17%
	Unsealed Average	**Total Area Average**	**% average**
	815	4,913	17%
Max	111254	153034	73%
Min	100	2110	1%

Location (regional)	Unsealed area (m^2)	Total area (m^2)	% unsealed
Loxton	987	2154	46%
Moonta	1	920	0%
Whyalla	6224	11054	56%
Mt Gambier	1506	3884	39%
Kapunda	1	395	0%
Peterborough	519	994	52%
Port Pirie	7875	19297	41%
Port Augusta	961	2461	39%
Murray Bridge	796	2005	40%
Berri	583	3065	19%
Kadina	1	577	0%
Port Lincoln	420	6058	7%
Renmark	70	3573	2%
Tanunda	168	1438	12%
Victor Harbor	400	1847	22%
Wallaroo	1032	1600	65%
	Unsealed Average	**Total Area Average**	**% average**
	222	2,276	10%
Max	7875	19297	65%
Min	1	395	0%

Summary of exposure parameters

Summary of Exposure Parameters	units	Parameter			Rationale
		HIL D	SA MFS SSHIL - Urban	SA MFS SSHIL - Regional	
Soil and Dust Ingestion Rate	mg/day	25	50	50	HIL D assumes that the incidential soil ingestion rate experienced by adults working for 8-hours on a commercial industrial site (25 mg/day) is likely to be ~50% of that experienced by adults in a residential setting (50 mg/day), given that waking hours are typically ~16-hours per day. The ASC NEPM residential soil ingestion rate has been adopted for SA MFS firefighters, given that substantial areas of unsealed ground are present on some of the SA MFS fire stations and firefighters may spend significant periods of time outdoors. This assumption is likely to be conservative for firefighters in regional settings, who typically spend less time onsite
Time Spent Outdoors	hours	1	4	2	HIL D assumes a standard 8-hour working day, with minimal time spent outdoors. MFS SA has indicated that: - firefighters in metropolitan locations typically work 12-hour shifts - firefighters in regional locations typically work 3-hour shifts It has also been assumed that firefighters may spend significant amounts of time outdoors, undertaking activities such as training and equipment and facility maintenance
Time Spent Indoors	hours	8	8	1	
Lung Retention Factor	-	0.375	0.375	0.375	ASC NEPM default, as detailed in Schedule B7. Describes the percentage of dust that is small enough to be inhaled.
Particulate Emission Factor	(m^3/kg)	3.70E+10	9.7E+09	9.7E+09	Calculated as described in Schedule B7 of the ASC NEPM. For HIL D, up to 20% of the site is assumed to be open ground. For the SA MFS fire stations up to 75% of the site is assumed to be open ground
Indoor Air Dust Factor	(m^3/kg)	2.6E+07	2.6E+07	2.6E+07	ASC NEPM default, as described in Schedule B7. The indoor dust concentration is assumed to be equal to the 95th percentile from Australian data (enHealth 2012; 39 µg/m^3), noting that indoor air can be enriched with dust compared to the outdoor environment, due to the movement of dust indoors on clothing, footwear etc.
Fraction of indoor dust comprised of outdoor soil	-	0.5	0.5	0.5	ASC NEPM default, as described in Schedule B7. Assume 50% of indoor dust is comprised of soi tracked into the building
Body weight	kg	70	70	70	ASC NEPM default, as described in Schedule B7.
Exposure Frequency	days/year	240	140	52	HIL D assumes a 5-day working week for 48 weeks per year. MFS has indicated that - firefighters in metropolitan stations typically work four shifts every eight days - firefighters in regional stations typically work one 3-hour shift per week
Exposure Duration	years	30	30	30	ASC NEPM default, as described in Schedule B7. Note that this parameter does not influence the derived HIL for threshold chemicals, as exposure is averaged over the exposure duration.
Averaging Time (ingestion)	days	10950	10950	10950	Calculated based on the exposure duration. Multiplied by 24 hours for the assessment of inhalation exposures
Averaging Time (inhalation)	hours	262800	262800	262800	

Attachment 2

SA MFS directive on the removal of produce

Government of South Australia

SOUTH AUSTRALIAN METROPOLITAN FIRE SERVICE

MEMORANDUM NO. 77/2022

METROPOLITAN FIRE SERVICE SOUTH AUSTRALIA

29 September 2022

FRUIT AND VEGETABLE GARDEN REMOVAL FROM ALL MFS STATIONS

MFS is directing all MFS stations to remove all fruit and vegetable gardens from MFS stations.

This is required to be completed by the **31st of October 2022**.

Garden waste can be disposed of as per the normal station procedures to dispose of this sort of waste. Where this is not practicable due to volume, please contact your Commander to arrange for an alternative solution, such as the provision of the high sided/skip pod.

If the fruit and vegetable garden cannot be removed by station personnel, please advise via the mfspfas@sa.gov.au. That email is to contain an audit of all fruit/vegetable trees that require removal by external contractors prior to 21 October 2022. The MFS will then arrange for these to be removed.

All fruit and vegetable gardens are required to be removed as the EPA see the presence of fruit and vegetable trees on fire stations as a possible human receptor to PFAS (even if you are not consuming the fruit and vegetables from them).

The MFS will provide ornamental plants and vegetation to replace the plants pulled out up to a value of $100 on application. Applications from each station can be sent to mfspfas@sa.gov.au. Approval will then be forwarded to the relevant Metropolitan/Regional Commander to use their credit card to purchase the goods.

Metropolitan and Regional Commanders are to ensure that there are no fruit and vegetable gardens remaining at their relevant stations after the 31st of October 2022.

C Shift is responsible under the Station Management System - Station Administration, to ensure that this document is read, signed, placed on the Notice Board and filed.

Staff are reminded that the current SAPs, SOPs, Policies, SP Forms, Memorandums, Service Directives and Operational Procedures are available on the Members Only Website (MOW). This is a directive from the Chief Officer.

SIGNED

M. Morgan
CHIEF OFFICER and
CHIEF EXECUTIVE

ACTION	DATE	SIGN
Instruction received at Station		
Instruction read to “A” Shift		
Instruction read to “B” Shift		
Instruction read to “C” Shift		
Instruction read to “D” Shift		
Instruction read to Retained Staff		
Instruction read to OTR		
Placed on Notice Board		
Filed in Station File		

Attachment 3

SSHILs modelling inputs and outputs.

Derivation of Site specific health investigation levels

Firefighters at regional fire stations - South Australian Metropolitan Fire Service

Summary of Exposure Parameters	Abbreviation	units	Parameter	References/Notes
Soil and Dust Ingestion Rate - Adults	IR_{SA}	mg/day	50	Site-specific assumption: Consistent with assumption adopted for adults in residential settings
Time Spent Outdoors	ETo	hours	1	Site-specific assumption; 3-hour shifts during which 1 hour is spent outdoors.
Time Spent Indoors	ETi	hours	2	Site-specific assumption; 3-hour shifts during which 2 hours are spent indoors.
Lung Retention Factor	RF	-	0.375	ASC NEPM default assumption
Particulate Emission Factor	PEFo	(m^3/kg)	9.7E+09	Calculated: Based on the site-specific assumption that up to 75% of individual sites is open ground
Indoor Air Dust Factor	PEFi	(m^3/kg)	2.6E+07	ASC NEPM default assumption
Fraction of indoor dust comprised of outdoor soil	TF	-	0.5	ASC NEPM default
Body weight - Adults	BW_C	kg	70	ASC NEPM default
Exposure Frequency	EF	days/year	52	Site-specific assumption: One shift per week
Exposure Duration - Adults	ED_C	years	30	ASC NEPM default assumption
Averaging Time (non-carcinogenic)	AT_T	days	ED*365	Calculated based on ED for each relevant age group, multiplied by 24 hours for the assessment of inhalation exposures

Threshold Calculations - Adult Worker

Compound	Toxicity Reference Value Oral (TRV_O) (mg/kg/day)	GI Absorption (GAF) (unitless)	Toxicity Reference Value Dermal (TRV_D) (mg/kg/day)	Oral Bioavailability BA_O (%)	Dermal Absorption Factor (DAF) (unitless)	Background Intake Oral/Dermal (BI_O) (% of TDI)	Toxicity Reference Value Inhalation (TRV_I) (mg/m^3)	Background Intake Inhalation (BIi) (% of TC)		Pathway Specific HILs (mg/kg)			Derived Soil HIL (not rounded) (mg/kg)
										Soil Ingestion	Dermal	Dust	
PFOS+PFHxS	0.00002	1	0.00002	100%	-	80%	0.00007	0%		3.9E+01	NA	8.0E+05	39
PFOA	0.00016	1	0.00016	100%	-	80%	0.00056	0%		3.1E+02	NA	6.4E+06	314

NA Pathway not of significance for chemical assessed

Derivation of Site specific health investigation levels

Fire fighters at metropolitan fire stations - South Australian Metropolitan Fire Service

Summary of Exposure Parameters	Abbreviation	units	Parameter	References/Notes
Soil and Dust Ingestion Rate - Adults	IR_{SA}	mg/day	50	Site-specific assumption: Consistent with assumption adopted for adults in residential settings
Time Spent Outdoors	ETo	hours	4	Site-specific assumption; 12-hour shifts during which 4 hours are spent outdoors.
Time Spent Indoors	ETi	hours	8	Site-specific assumption; 12-hour shifts during which 8 hours are spent indoors.
Lung Retention Factor	RF	-	0.375	ASC NEPM default assumption
Particulate Emission Factor	PEFo	(m^3/kg)	9.7E+09	Calculated: Based on the site-specific assumption that up to 75% of individual sites is open ground
Indoor Air Dust Factor	PEFi	(m^3/kg)	2.6E+07	ASC NEPM default assumption
Fraction of indoor dust comprised of outdoor soil	TF	-	0.5	ASC NEPM default
Body weight - Adults	BW_C	kg	70	ASC NEPM default
Exposure Frequency	EF	days/year	146	Site-specific assumption: Four shifts every eight days (i.e., four days at work and four days off)
Exposure Duration - Adults	ED_C	years	30	ASC NEPM default assumption
Averaging Time (non-carcinogenic)	AT_T	days	ED*365	Calculated based on ED, multiplied by 24 hours for the assessment of inhalation exposures

Threshold Calculations - Adult Worker

Compound	Toxicity Reference Value Oral (TRV_O) (mg/kg/day)	GI Absorption (GAF) (unitless)	Toxicity Reference Value Dermal (TRV_D) (mg/kg/day)	Oral Bioavailability BA_O (%)	Dermal Absorption Factor (DAF) (unitless)	Background Intake Oral/Dermal (BI_O) (% of TDI)	Toxicity Reference Value Inhalation (TRV_I) (mg/m^3)	Background Intake Inhalation (BIi) (% of TC)		Pathway Specific HILs (mg/kg)			Derived Soil HIL (not rounded) (mg/kg)
										Soil Ingestion	Dermal	Dust	
PFOS+PFHxS	0.00002	1	0.00002	100%	-	80%	0.00007	0%		1.4E+01	NA	7.2E+04	14
PFOA	0.00016	1	0.00016	100%	-	80%	0.00056	0%		1.1E+02	NA	5.7E+05	112

NA Pathway not of significance for chemical assessed

Appendix F

Laboratory Reports

COPY

3

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address: Level 4 - 211 Victoria Square, Adelaide SA 5000, Telephone: (08) 8111 5800

Completion Date / Turnaround: STANDARD

Quote #: Quote 230726GHDS

Page 5 of 6

Project Number	12516806
Project Name	MFS Peterborough DSI
GHD Project Manager	Tom Duncan
GHD Contact	Josh Anderson
GHD PM email	Tom.Duncan@ghd.com
GHD Contact email	Josh.Anderson2@ghd.com

Laboratory: Eurofins

Laboratory Address: 6 Mackay Road, Dandenong VIC 3175

Laboratory Contact: Amy Meunier

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on receipt and release of samples, between each party
- Samples are to be delivered to the laboratory address shown
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested
- All results should reference the Job Number and Project Name
- All results should be provided in NATA accredited pdf format and ESDAT format

Sample I.D.	Date and Time	Composite Sample?	Sample Matrix (Soil, Water, Waste, Air, Veg, Groundwater)	Preservative	Containers: Type (P = plastic, G = glass bottle, V = vial, J = jar, B = bag)	Containers: Number	Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ENVIROLAB	SAMPLE COMMENTS
MW01	27-Sep-23		GW	Ice	P	2		X			
MW02	27-Sep-23		GW	Ice	P	2		X			
MW03	27-Sep-23		GW	Ice	P	2		X			
RB01	27-Sep-23		GW	Ice	P	2		X			
FB01	27-Sep-23		GW	Ice	P	2		X			
FD01	27-Sep-23		GW	Ice	P	2		X			
1 FS01	27-Sep-23		GW	Ice	P	2		X		X	Please forward to envirolab
TOTAL NUMBER OF SAMPLES	7										
TOTAL NUMBER OF ESKIES	1										

CUSTODY DETAILS
SAMPLER

GHD SERVICE CENTRE		Date/Time	Relinquished by: Matthew A		4/10/23 8am
Received by:		Date/Time	Relinquished by:		Date/Time
COURIER					
Received by Courier:		Date/Time	Relinquished by:		Date/Time
LABORATORY					
Received by Lab:		Date/Time			

Envirolab Services
25 Research Drive
Croydon South VIC 3136
Ph: (03) 9763 2500

Job No 39940

Date Received 4/10/23
Time Received 12:40pm
Received By: AG
Temp: Cool/Ambient 6.6°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 39940

Client Details

Client	GHD SA
Attention	Tom Duncan
Address	Level 4, 211 Victoria Square, Adelaide, SA, 5000

Sample Details

Your Reference	**12616806**
Number of Samples	1 Water
Date samples received	04/10/2023
Date completed instructions received	04/10/2023

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	11/10/2023
Date of Issue	10/10/2023

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Azrin Akram, Senior Chemist

Authorised By
Pamela Adams, Laboratory Manager

PFAS in Waters Extended		
Our Reference		39940-1
Your Reference	UNITS	FS01
Date Sampled		27/09/2023
Type of sample		Water
Date prepared	-	05/10/2023
Date analysed	-	05/10/2023
Perfluorobutanesulfonic acid	µg/L	1.1
Perfluoropentanesulfonic acid	µg/L	0.88
Perfluorohexanesulfonic acid PFHxS	µg/L	4.2
Perfluoroheptanesulfonic acid	µg/L	0.09
Perfluorooctanesulfonic acid PFOS	µg/L	0.61
Perfluorodecanesulfonic acid	µg/L	<0.02
Perfluorobutanoic acid	µg/L	0.2
Perfluoropentanoic acid	µg/L	0.32
Perfluorohexanoic acid	µg/L	1.5
Perfluoroheptanoic acid	µg/L	0.08
Perfluorooctanoic acid PFOA	µg/L	0.07
Perfluorononanoic acid	µg/L	<0.01
Perfluorodecanoic acid	µg/L	<0.02
Perfluoroundecanoic acid	µg/L	<0.02
Perfluorododecanoic acid	µg/L	<0.05
Perfluorotridecanoic acid	µg/L	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5
4:2 FTS	µg/L	<0.01
6:2 FTS	µg/L	<0.01
8:2 FTS	µg/L	<0.02
10:2 FTS	µg/L	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05
N-Ethyl perfluorooctanesulfon -amide	µg/L	<0.1
N-Me perfluorooctanesulfonamid -oethanol	µg/L	<0.05
N-Et perfluorooctanesulfonamid -oethanol	µg/L	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02
Surrogate $^{13}C_8$ PFOS	%	98
Surrogate $^{13}C_2$ PFOA	%	100
Extracted ISTD $^{13}C_3$ *PFBS*	%	83
Extracted ISTD $^{18}O_2$ *PFHxS*	%	81
Extracted ISTD $^{13}C_4$ *PFOS*	%	85
Extracted ISTD $^{13}C_4$ *PFBA*	%	81

PFAS in Waters Extended		
Our Reference		39940-1
Your Reference	UNITS	FS01
Date Sampled		27/09/2023
Type of sample		Water
Extracted ISTD $^{13}C_3$ *PFPeA*	%	83
Extracted ISTD $^{13}C_2$ *PFHxA*	%	81
Extracted ISTD $^{13}C_4$ *PFHpA*	%	82
Extracted ISTD $^{13}C_4$ *PFOA*	%	86
Extracted ISTD $^{13}C_5$ *PFNA*	%	85
Extracted ISTD $^{13}C_2$ *PFDA*	%	84
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	84
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	85
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	78
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	83
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	92
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	84
Extracted ISTD $^{13}C_8$ *FOSA*	%	88
Extracted ISTD d_3 *N MeFOSA*	%	84
Extracted ISTD d_5 *NEtFOSA*	%	86
Extracted ISTD d_7 *N MeFOSE*	%	93
Extracted ISTD d_9 *N EtFOSE*	%	95
Extracted ISTD d_3 *N MeFOSAA*	%	80
Extracted ISTD d_5 *N EtFOSAA*	%	81
Total Positive PFHxS & PFOS	µg/L	4.8
Total Positive PFOS & PFOA	µg/L	0.69
Total Positive PFAS	µg/L	8.9

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLP/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER

QUALITY CONTROL: PFAS in Waters Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	126	[NT]
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	122	[NT]
Perfluorohexanesulfonic acid PFHxS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	127	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	130	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	121	[NT]
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	113	[NT]
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	121	[NT]
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	124	[NT]
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	121	[NT]
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	123	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	120	[NT]
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	120	[NT]
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	125	[NT]
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	113	[NT]
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	121	[NT]
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	126	[NT]
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	119	[NT]
4:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	123	[NT]
6:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	115	[NT]
8:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	120	[NT]
10:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	127	[NT]
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	110	[NT]
N-Ethyl perfluorooctanesulfon -amide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
N-Me perfluorooctanesulfonamid -oethanol	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	137	[NT]
N-Et perfluorooctanesulfonamid -oethanol	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	123	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	138	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	125	[NT]
Surrogate $^{13}C_8$ PFOS	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	105	[NT]
Surrogate $^{13}C_2$ PFOA	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	100	[NT]
Extracted ISTD $^{13}C_3$ PFBS	%		Org-029	81	[NT]	[NT]	[NT]	[NT]	80	[NT]

QUALITY CONTROL: PFAS in Waters Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	81	[NT]	[NT]	[NT]	[NT]	83	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	83	[NT]	[NT]	[NT]	[NT]	84	[NT]
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	92	[NT]	[NT]	[NT]	[NT]	81	[NT]
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	81	[NT]	[NT]	[NT]	[NT]	81	[NT]
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	79	[NT]	[NT]	[NT]	[NT]	82	[NT]
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	82	[NT]	[NT]	[NT]	[NT]	81	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	88	[NT]	[NT]	[NT]	[NT]	83	[NT]
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	91	[NT]	[NT]	[NT]	[NT]	85	[NT]
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	87	[NT]	[NT]	[NT]	[NT]	82	[NT]
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	88	[NT]	[NT]	[NT]	[NT]	82	[NT]
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	89	[NT]	[NT]	[NT]	[NT]	81	[NT]
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	78	[NT]	[NT]	[NT]	[NT]	77	[NT]
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	83	[NT]	[NT]	[NT]	[NT]	84	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	93	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	93	[NT]	[NT]	[NT]	[NT]	94	[NT]
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	92	[NT]	[NT]	[NT]	[NT]	86	[NT]
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	88	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD d_5 *NEtFOSA*	%		Org-029	85	[NT]	[NT]	[NT]	[NT]	87	[NT]
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	95	[NT]	[NT]	[NT]	[NT]	93	[NT]
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: PFAS in Waters Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	84	[NT]	[NT]	[NT]	[NT]	81	[NT]
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	83	[NT]	[NT]	[NT]	[NT]	79	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	GHD SA
Attention	Tom Duncan

Sample Login Details

Your reference	12616806
Envirolab Reference	39940
Date Sample Received	04/10/2023
Date Instructions Received	04/10/2023
Date Results Expected to be Reported	11/10/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	6.6
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Pamela Adams	Chris De Luca
Phone: 03 9763 2500	**Phone: 03 9763 2500**
Fax: 03 9763 2633	**Fax: 03 9763 2633**
Email: padams@envirolab.com.au	**Email: cdeluca@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645 - 002
25 Research Drive Croydon South VIC 3136
ph 03 9763 2500 fax 03 9763 2633
melbourne@envirolab.com.au
www.envirolab.com.au

Sample ID	PFAS in Waters Extended
FS01	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

COPY

3

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address: Level 4 - 211 Victoria Square, Adelaide SA 5000, Telephone: (08) 8111 5800

Completion Date / Turnaround: STANDARD

Quote #: Quote 230726GHDS

Page 5 of 6

Project Number	12516806
Project Name	MFS Peterborough DSI
GHD Project Manager	Tom Duncan
GHD Contact	Josh Anderson
GHD PM email	Tom.Duncan@ghd.com
GHD Contact email	Josh.Anderson2@ghd.com

Laboratory: Eurofins

Laboratory Address: 6 Mackay Road, Dandenong VIC 3175

Laboratory Contact: Amy Meunier

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on receipt and release of samples, between each party
- Samples are to be delivered to the laboratory address shown
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested
- All results should reference the Job Number and Project Name
- All results should be provided in NATA accredited pdf format and ESDAT format

Sample I.D.	Date and Time	Composite Sample?	Sample Matrix (Soil, Water, Waste, Air, Veg, Groundwater)	Preservative	Containers: Type (P = plastic, G = glass bottle, V = vial, J = jar, B = bag)	Containers: Number	Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ENVIROLAB	SAMPLE COMMENTS
MW01	27-Sep-23		GW	Ice	P	2		X			
MW02	27-Sep-23		GW	Ice	P	2		X			
MW03	27-Sep-23		GW	Ice	P	2		X			
RB01	27-Sep-23		GW	Ice	P	2		X			
FB01	27-Sep-23		GW	Ice	P	2		X			
FD01	27-Sep-23		GW	Ice	P	2		X			
1 FS01	27-Sep-23		GW	Ice	P	2		X		X	Please forward to envirolab
TOTAL NUMBER OF SAMPLES	7										
TOTAL NUMBER OF ESKIES	1										

CUSTODY DETAILS
SAMPLER

GHD SERVICE CENTRE		Date/Time	Relinquished by: Matthew A		4/10/23 8am
Received by:		Date/Time	Relinquished by:		Date/Time
COURIER					
Received by Courier:		Date/Time	Relinquished by:		Date/Time
LABORATORY					
Received by Lab:		Date/Time			

Envirolab Services
25 Research Drive
Croydon South VIC 3136
Ph: (03) 9763 2500

Job No 39940

Date Received 4/10/23
Time Received 12:40pm
Received By: AG
Temp: Cool/Ambient 6.6°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

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SAMPLE RECEIPT ADVICE

Client Details

Client	GHD SA
Attention	Tom Duncan

Sample Login Details

Your reference	12616806
Envirolab Reference	39940
Date Sample Received	04/10/2023
Date Instructions Received	04/10/2023
Date Results Expected to be Reported	11/10/2023

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	1 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	6.6
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Pamela Adams	Chris De Luca
Phone: 03 9763 2500	**Phone: 03 9763 2500**
Fax: 03 9763 2633	**Fax: 03 9763 2633**
Email: padams@envirolab.com.au	**Email: cdeluca@envirolab.com.au**

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Sample ID	PFAS in Waters Extended
FS01	✓

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Additional Info

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Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

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www.envirolab.com.au

CERTIFICATE OF ANALYSIS 39940

Client Details

Client	GHD SA
Attention	Tom Duncan
Address	Level 4, 211 Victoria Square, Adelaide, SA, 5000

Sample Details

Your Reference	**12616806**
Number of Samples	1 Water
Date samples received	04/10/2023
Date completed instructions received	04/10/2023

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	11/10/2023
Date of Issue	10/10/2023

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Results Approved By
Azrin Akram, Senior Chemist

Authorised By
Pamela Adams, Laboratory Manager

PFAS in Waters Extended		
Our Reference		39940-1
Your Reference	UNITS	FS01
Date Sampled		27/09/2023
Type of sample		Water
Date prepared	-	05/10/2023
Date analysed	-	05/10/2023
Perfluorobutanesulfonic acid	µg/L	1.1
Perfluoropentanesulfonic acid	µg/L	0.88
Perfluorohexanesulfonic acid PFHxS	µg/L	4.2
Perfluoroheptanesulfonic acid	µg/L	0.09
Perfluorooctanesulfonic acid PFOS	µg/L	0.61
Perfluorodecanesulfonic acid	µg/L	<0.02
Perfluorobutanoic acid	µg/L	0.2
Perfluoropentanoic acid	µg/L	0.32
Perfluorohexanoic acid	µg/L	1.5
Perfluoroheptanoic acid	µg/L	0.08
Perfluorooctanoic acid PFOA	µg/L	0.07
Perfluorononanoic acid	µg/L	<0.01
Perfluorodecanoic acid	µg/L	<0.02
Perfluoroundecanoic acid	µg/L	<0.02
Perfluorododecanoic acid	µg/L	<0.05
Perfluorotridecanoic acid	µg/L	<0.1
Perfluorotetradecanoic acid	µg/L	<0.5
4:2 FTS	µg/L	<0.01
6:2 FTS	µg/L	<0.01
8:2 FTS	µg/L	<0.02
10:2 FTS	µg/L	<0.02
Perfluorooctane sulfonamide	µg/L	<0.1
N-Methyl perfluorooctane sulfonamide	µg/L	<0.05
N-Ethyl perfluorooctanesulfon -amide	µg/L	<0.1
N-Me perfluorooctanesulfonamid -oethanol	µg/L	<0.05
N-Et perfluorooctanesulfonamid -oethanol	µg/L	<0.5
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.02
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.02
Surrogate $^{13}C_8$ PFOS	%	98
Surrogate $^{13}C_2$ PFOA	%	100
Extracted ISTD $^{13}C_3$ *PFBS*	%	83
Extracted ISTD $^{18}O_2$ *PFHxS*	%	81
Extracted ISTD $^{13}C_4$ *PFOS*	%	85
Extracted ISTD $^{13}C_4$ *PFBA*	%	81

PFAS in Waters Extended		
Our Reference		39940-1
Your Reference	UNITS	FS01
Date Sampled		27/09/2023
Type of sample		Water
Extracted ISTD $^{13}C_3$ *PFPeA*	%	83
Extracted ISTD $^{13}C_2$ *PFHxA*	%	81
Extracted ISTD $^{13}C_4$ *PFHpA*	%	82
Extracted ISTD $^{13}C_4$ *PFOA*	%	86
Extracted ISTD $^{13}C_5$ *PFNA*	%	85
Extracted ISTD $^{13}C_2$ *PFDA*	%	84
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	84
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	85
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	78
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	83
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	92
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	84
Extracted ISTD $^{13}C_8$ *FOSA*	%	88
Extracted ISTD d_3 *N MeFOSA*	%	84
Extracted ISTD d_5 *NEtFOSA*	%	86
Extracted ISTD d_7 *N MeFOSE*	%	93
Extracted ISTD d_9 *N EtFOSE*	%	95
Extracted ISTD d_3 *N MeFOSAA*	%	80
Extracted ISTD d_5 *N EtFOSAA*	%	81
Total Positive PFHxS & PFOS	µg/L	4.8
Total Positive PFOS & PFOA	µg/L	0.69
Total Positive PFAS	µg/L	8.9

Method ID	Methodology Summary
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLP/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER

QUALITY CONTROL: PFAS in Waters Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Perfluorobutanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	126	[NT]
Perfluoropentanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	122	[NT]
Perfluorohexanesulfonic acid PFHxS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	127	[NT]
Perfluoroheptanesulfonic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	130	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	121	[NT]
Perfluorodecanesulfonic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	113	[NT]
Perfluorobutanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	121	[NT]
Perfluoropentanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	124	[NT]
Perfluorohexanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	121	[NT]
Perfluoroheptanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	123	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	120	[NT]
Perfluorononanoic acid	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	120	[NT]
Perfluorodecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	125	[NT]
Perfluoroundecanoic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	113	[NT]
Perfluorododecanoic acid	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	121	[NT]
Perfluorotridecanoic acid	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	126	[NT]
Perfluorotetradecanoic acid	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	119	[NT]
4:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	123	[NT]
6:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	115	[NT]
8:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	120	[NT]
10:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	127	[NT]
Perfluorooctane sulfonamide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
N-Methyl perfluorooctane sulfonamide	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	110	[NT]
N-Ethyl perfluorooctanesulfon -amide	µg/L	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	111	[NT]
N-Me perfluorooctanesulfonamid -oethanol	µg/L	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	137	[NT]
N-Et perfluorooctanesulfonamid -oethanol	µg/L	0.5	Org-029	<0.5	[NT]	[NT]	[NT]	[NT]	123	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	138	[NT]
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	125	[NT]
Surrogate $^{13}C_8$ PFOS	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	105	[NT]
Surrogate $^{13}C_2$ PFOA	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	100	[NT]
Extracted ISTD $^{13}C_3$ PFBS	%		Org-029	81	[NT]	[NT]	[NT]	[NT]	80	[NT]

QUALITY CONTROL: PFAS in Waters Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	81	[NT]	[NT]	[NT]	[NT]	83	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	83	[NT]	[NT]	[NT]	[NT]	84	[NT]
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	92	[NT]	[NT]	[NT]	[NT]	81	[NT]
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	81	[NT]	[NT]	[NT]	[NT]	81	[NT]
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	79	[NT]	[NT]	[NT]	[NT]	82	[NT]
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	82	[NT]	[NT]	[NT]	[NT]	81	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	88	[NT]	[NT]	[NT]	[NT]	83	[NT]
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	91	[NT]	[NT]	[NT]	[NT]	85	[NT]
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	87	[NT]	[NT]	[NT]	[NT]	82	[NT]
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	88	[NT]	[NT]	[NT]	[NT]	82	[NT]
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	89	[NT]	[NT]	[NT]	[NT]	81	[NT]
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	78	[NT]	[NT]	[NT]	[NT]	77	[NT]
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	83	[NT]	[NT]	[NT]	[NT]	84	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	93	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	93	[NT]	[NT]	[NT]	[NT]	94	[NT]
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	92	[NT]	[NT]	[NT]	[NT]	86	[NT]
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	88	[NT]	[NT]	[NT]	[NT]	95	[NT]
Extracted ISTD d_5 *NEtFOSA*	%		Org-029	85	[NT]	[NT]	[NT]	[NT]	87	[NT]
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	95	[NT]	[NT]	[NT]	[NT]	93	[NT]
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: PFAS in Waters Extended					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	84	[NT]	[NT]	[NT]	[NT]	81	[NT]
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	83	[NT]	[NT]	[NT]	[NT]	79	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address
Level 4 - 211 Victoria Square, Adelaide SA 5000
Telephone: (08) 8111 6800

Completion Date / Turnaround: STANDARD

Quote #: Quote GHD STANDARD RATES

Project Number: 12618606
Project Name: MFS Peterborough DSI
GHD Project Manager: Tom Duncan
GHD Contact: Ally Kinsman
GHD PM email: Tom.Duncan@ghd.com
GHD Contact email: Ally.Kinsman@ghd.com

Laboratory: Eurofins Environmental
Laboratory Address: 6 Mars Terrace, Richmond SA 5033
Laboratory Contact: Parimal Acharya

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on receipt and release of samples, between each party.
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and ESDAT format.

Sample I.D.	Date and Time	Composite Sample	Sample Matrix (S: Soil, W: Water, A: Air, Other: Specify)	Preservative	Containers: Type (J: soil jar, B: bag, V: vial, G: glass bottle, P: plastic bottle)	Containers: Number	Containers: Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ALS	SAMPLE COMMENTS
BH01_paver	24-Sep-23		Soil	Ice	J	1			X		
BH01_0.1	24-Sep-23		Soil	Ice	J	1			X		
BH01_0.5	24-Sep-23		Soil	Ice	J	1		X			
BH01_1.0	24-Sep-23		Soil	Ice	J	1			X		
BH01_1.5	24-Sep-23		Soil	Ice	J	1			X		
BH01_2.0	24-Sep-23		Soil	Ice	J	1		X			
BH01_2.5	24-Sep-23		Soil	Ice	J	1			X		
BH01_3.0	24-Sep-23		Soil	Ice	J	1			X		
BH01_3.5	24-Sep-23		Soil	Ice	J	1			X		
BH01_4.0	24-Sep-23		Soil	Ice	J	1			X		
BH01_4.5	24-Sep-23		Soil	Ice	J	1			X		
BH03_0.1	24-Sep-23		Soil	Ice	J	1		X			
BH03_0.5	24-Sep-23		Soil	Ice	J	1			X		
BH03_1.0	24-Sep-23		Soil	Ice	J	1			X		
BH03_1.5	24-Sep-23		Soil	Ice	J	1		X			
BH03_2.0	24-Sep-23		Soil	Ice	J	1			X		
BH03_2.5	24-Sep-23		Soil	Ice	J	1			X		
BH03_3.0	24-Sep-23		Soil	Ice	J	1			X		
BH03_3.5	24-Sep-23		Soil	Ice	J	1			X		
BH03_4.0	24-Sep-23		Soil	Ice	J	1			X		
BH03_4.5	24-Sep-23		Soil	Ice	J	1			X		
BH04_0.1	24-Sep-23		Soil	Ice	J	1			X		
BH04_0.5	24-Sep-23		Soil	Ice	J	1		X			
BH04_1.0	24-Sep-23		Soil	Ice	J	1			X		
BH04_1.5	24-Sep-23		Soil	Ice	J	1			X		
TOTAL NUMBER OF SAMPLES	113										
TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS

SAMPLER			
	Date/Time	Relinquished by	Date/Time
GHD SERVICE CENTRE			
Received by	Date/Time	Relinquished by	Date/Time
COURIER			

#1029914

27/9/23

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address	Completion Date / Turnaround	Quote #
Level 4 - 211 Victoria Square, Adelaide SA 5000 Telephone: (08) 8111 6600	STANDARD	Quote GHD STANDARD RATES

Project Number: 12618606	Laboratory: Eurofins Environmental
Project Name: MFS Peterborough DBI	Laboratory Address: 1 Main Terrace Richmond SA 5033
GHD Project Manager: Tom Duncan	Laboratory Contact: Amy Mounker
GHD Contact: Ally Kinman	
GHD PM email: Tom.Duncan@ghd.com	GHD Contact email: Ally.Kinman@ghd.com

COURIER AND LABORATORY INSTRUCTIONS:

- Sign chain of custody document on receipt and release of samples, between each party.
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- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and ESDAT format.

Sample I.D.	Date and Time	Composite Sample	Sample Matrix W: Soil WI: Soluble Water GW: Groundwater	Preservative	Containers: Type J: soil jar B: bag V: vial G: glass bottle P: plastic cabin	Containers: Number	Containers: Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO EUROFINS	SAMPLE COMMENTS
BH04_2.0	24-Sep-23		Soil	Ice	J	1			X		
BH04_2.5	24-Sep-23		Soil	Ice	J	1		X			
BH04_3.0	24-Sep-23		Soil	Ice	J	1			X		
BH04_3.5	24-Sep-23		Soil	Ice	J	1			X		
BH04_4.3	24-Sep-23		Soil	Ice	J	1			X		
BH05_0.1	22-Sep-23		Soil	Ice	J	1			X		
BH05_0.5	22-Sep-23		Soil	Ice	J	1		X			
BH05_1.0	22-Sep-23		Soil	Ice	J	1			X		
BH05_1.5	22-Sep-23		Soil	Ice	J	1			X		
BH05_2.0	22-Sep-23		Soil	Ice	J	1			X		
BH05_2.5	22-Sep-23		Soil	Ice	J	1		X			
BH05_3.0	22-Sep-23		Soil	Ice	J	1			X		
BH05_3.5	22-Sep-23		Soil	Ice	J	1			X		
BH05_4.2	22-Sep-23		Soil	Ice	J	1			X		
BH06_0.1	22-Sep-23		Soil	Ice	J	1			X		
BH06_0.5	22-Sep-23		Soil	Ice	J	1		X			
BH06_1.0	22-Sep-23		Soil	Ice	J	1			X		
BH06_1.5	22-Sep-23		Soil	Ice	J	1			X		
BH06_2.0	22-Sep-23		Soil	Ice	J	1			X		
BH06_2.5	22-Sep-23		Soil	Ice	J	1			X		
BH06_3.0	22-Sep-23		Soil	Ice	J	1			X		
BH06_3.5	22-Sep-23		Soil	Ice	J	1		X			
BH06_4.2	22-Sep-23		Soil	Ice	J	1			X		
TOTAL NUMBER OF SAMPLES	113										
TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS			
SAMPLER			
	Date/Time	Relinquished by	Date/Time
GHD SERVICE CENTRE			
Received by:	Date/Time	Relinquished by	Date/Time
COURIER			
Received by: Courier:	Date/Time	Relinquished by	Date/Time
LABORATORY			
Received by Lab:	Date/Time		

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address	Completion Date / Turnaround	Quote #
Level 4 - 211 Victoria Square, Adelaide SA 5000 Telephone: (08) 8111 6600	STANDARD	Quote GHD STANDARD RATES

Project Number	**Laboratory**
12511806	Eurofins Environmental
Project Name	**Laboratory Address**
MFB Peterborough DSI	6 Main Terrace, Richmond SA 5033
GHD Project Manager	**Laboratory Contact**
Tom Dunstan	Amy Meunier
GHD Contact	
Ally Kirkman	
GHD PM email	**GHD Contact email**
Tom.Dunstan@ghd.com	Ally.Kirkman@ghd.com

COURIER AND LABORATORY INSTRUCTIONS:

- Sign chain of custody document on receipt and release of samples, between each party.
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- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and ESDAT format.

Sample I.D.	Date and Time	Composite Sample	Sample Matrix (S: Soil, SED: Sediment, W: Water, A: Air, GW: Groundwater)	Preservative	Containers: Type (J: soil jar, B: bag, V: vial, G: glass bottle, P: plastic bottle)	Containers: Number	Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO EUROFINS	SAMPLE COMMENTS
SS01	23-Sep-23		Soil	Ice	J	1		X			
SS02	23-Sep-23		Soil	Ice	J	1		X			
SS03	23-Sep-23		Soil	Ice	J	1		X			
SS04	23-Sep-23		Soil	Ice	J	1		X			
MW01_0.1	23-Sep-23		Soil	Ice	J	1			X		
MW01_0.5	23-Sep-23		Soil	Ice	J	1		X			
MW01_1.0	23-Sep-23		Soil	Ice	J	1			X		
MW01_1.5	23-Sep-23		Soil	Ice	J	1			X		
MW01_2.0	23-Sep-23		Soil	Ice	J	1			X		
MW01_2.5	23-Sep-23		Soil	Ice	J	1			X		
MW01_3.0	23-Sep-23		Soil	Ice	J	1			X		
MW01_3.5	23-Sep-23		Soil	Ice	J	1			X		
MW01_4.0	23-Sep-23		Soil	Ice	J	1			X		
MW01_4.5	23-Sep-23		Soil	Ice	J	1		X			
MW01_15	23-Sep-23		Soil	Ice	J	1			X		
MW02_0.1	22-Sep-23		Soil	Ice	J	1			X		
MW02_0.5	22-Sep-23		Soil	Ice	J	1		X			
MW02_1.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_1.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_2.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_2.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_3.0	21-Sep-23		Soil	Ice	J	1			X		
TOTAL NUMBER OF SAMPLES	114										
TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS			
SAMPLER	Date/Time	Relinquished by:	Date/Time
GHD SERVICE CENTRE			
Received by:	Date/Time	Relinquished by:	Date/Time
COURIER			
Received by Courier:	Date/Time	Relinquished by:	Date/Time
LABORATORY			
Received by Lab:	Date/Time		

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address	Completion Date / Turnaround	Quote #
Level 4 - 211 Victoria Square, Adelaide SA 5000 Telephone: (08) 8111 6600	STANDARD	Quote GHD STANDARD RATES

Project Number	12516806
Project Name	MFS Peterborough DSI
GHD Project Manager	Tom Duncan
GHD Contact	Ally Kirkman
GHD PM email	Tom.Duncan@ghd.com
GHD Contact email	Ally.Kirkman@ghd.com
Laboratory	Eurofins Environmental
Laboratory Address	9 Main Terrace, Richmond SA 5033
Laboratory Contact	Amy Meunier

COURIER AND LABORATORY INSTRUCTIONS:

- Sign chain of custody document on receipt and release of samples, between each party
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.

All results should reference the Job Number and Project Name.

All results should be provided in NATA accredited pdf format and EDDAT format.

Sample I.D.	Date and Time	Composite Sample	Sample Matrix (S: Soil, W: Water, A: Air, GW: Groundwater)	Preservative	Containers: Type (J: acid jar, B: bag, V: vial, G: glass bottle, P: plastic bottle)	Containers: Number	Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO EUROFINS	SAMPLE COMMENTS
MW02_3.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_4.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_4.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_5.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_5.5	21-Sep-23		Soil	Ice	J	1		X			
MW02_6.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_6.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_7.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_7.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_8.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_8.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_9.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_9.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_10.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_12.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_15.0	21-Sep-23		Soil	Ice	J	1			X		
MW03_0.1	23-Sep-23		Soil	Ice	J	1			X		
MW03_0.5	23-Sep-23		Soil	Ice	J	1		X			
MW03_1.0	23-Sep-23		Soil	Ice	J	1			X		
MW03_1.5	23-Sep-23		Soil	Ice	J	1			X		
TOTAL NUMBER OF SAMPLES	113										
TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS			
SAMPLER			
	Date/Time	Relinquished by	Date/Time
GHD SERVICE CENTRE			
Received by:	Date/Time	Relinquished by:	Date/Time
COURIER			
Received by Courier:	Date/Time	Relinquished by:	Date/Time
LABORATORY			
Received by Lab:	Date/Time		

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address	Completion Date / Turnaround	Quote #
Level 4 - 211 Victoria Square, Adelaide SA 5000 Telephone: (08) 8111 6800	STANDARD	Quote GHD STANDARD RATES

Project Number 12616806	Laboratory Eurofins Environmental
Project Name MFB Peterborough DSI	Laboratory Address 9 Main Terrace, Richmond SA 5033
GHD Project Manager Tom Dunnan	Laboratory Contact Pannal Acharya
GHD Contact Ally Kirkman	
GHD PM email Tom.Dunnan@ghd.com	GHD Contact email Ally.Kirkman@ghd.com

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on reciept and release of samples, between each party
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of reciept.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and ESDAT format.

Sample I.D.	Date and Time	Composite Sample	Sample Matrix (S: soil, W: water, A: Air, GW: Groundwater)	Preservative	Containers: Type (J: soil jar, G: glass bottle, P: plastic bottle, B: bag)	Containers: Number	Containers: Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ALS	SAMPLE COMMENTS
MW03_2.0	23-Sep-23		Soil	Ice	J	1			X		
MW03_2.5	23-Sep-23		Soil	Ice	J	1			X		
MW03_3.0	23-Sep-23		Soil	Ice	J	1		X			
MW03_3.5	23-Sep-23		Soil	Ice	J	1			X		
MW03_14.0	23-Sep-23		Soil	Ice	J	1			X		
FD01	22-Sep-23		Soil	Ice	J	1			X		
FS01	22-Sep-23		Soil	Ice	J	1			X		
FD02	22-Sep-23		Soil	Ice	J	1			X		
FS02	22-Sep-23		Soil	Ice	J	1			X		
FD03	22-Sep-23		Soil	Ice	J	1		X			
FS03	22-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD04	23-Sep-23		Soil	Ice	J	1		X			
FS04	23-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD05	23-Sep-23		Soil	Ice	J	1			X		
FS05	23-Sep-23		Soil	Ice	J	1			X		
FD06	23-Sep-23		Soil	Ice	J	1		X			
FS06	23-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD07	24-Sep-23		Soil	Ice	J	1			X		
FS07	24-Sep-23		Soil	Ice	J	1			X		
FD08	24-Sep-23		Soil	Ice	P	1		X			
FS08	24-Sep-23		Soil	Ice	P	1				X	Please forward to ALS for analysis
FB01	22-Sep-23		Water	Ice	P	1		X			
RB01	22-Sep-23		Water	Ice	P	1		X			
RB02	23-Sep-23		Water	Ice	P	1		X			
RB03	24-Sep-23		Water	Ice	P	1		X			
TOTAL NUMBER OF SAMPLES	113										
TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS			
SAMPLER			
	Date/Time	Relinquished by:	Date/Time
GHD SERVICE CENTRE			
Received by:	Date/Time	Relinquished by:	Date/Time
COURIER			

12 EG

COPY

GHD

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address
Level 4 - 211 Victoria Square, Adelaide SA 5000
Telephone: (08) 8111 6800

Completion Date / Turnaround: STANDARD

Quote #: Quote GHD STANDARD RATES

Project Number	12618806
Project Name	MPB Peterborough DSI
GHD Project Manager	Tom Duncan
GHD Contact	Ally Kinman
GHD PM email	Tom.Duncan@ghd.com
GHD Contact email	Ally.Kinman@ghd.com
Laboratory	Eurofins Environmental
Laboratory Address	6 Main Terrace, Richmond SA 5033
Laboratory Contact	Parimal Acharya

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on receipt and release of samples, between each party.
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf formats and EDDAT format.

Sample I.D.	Date and Time	Container/Sample	Sample Matrix (i.e. Soil, Air, Water, Trip Blank, Rinsate, Field QC, Leachate, Other)	Preservative	Containers: Type (i.e. EnCore, Vial, Bag, Plastic, Amber Glass, Glass Jar, Speciation Bottle)	Containers: Number	Volume (ml)	Analysis Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ALS	SAMPLE COMMENTS
MW03_2.0	23-Sep-23		Soil	Ice	J	1			X		
MW03_2.5	23-Sep-23		Soil	Ice	J	1			X		
MW03_3.0	23-Sep-23		Soil	Ice	J	1		X			
MW03_3.5	23-Sep-23		Soil	Ice	J	1			X		
MW03_14.0	23-Sep-23		Soil	Ice	J	1			X		
FD01	22-Sep-23		Soil	Ice	J	1			X		
FS01	22-Sep-23		Soil	Ice	J	1			X		
FD02	22-Sep-23		Soil	Ice	J	1			X		
FS02	22-Sep-23		Soil	Ice	J	1			X		
FD03	22-Sep-23		Soil	Ice	J	1		X			
FS03	22-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD04	23-Sep-23		Soil	Ice	J	1		X			
FS04	23-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD05	23-Sep-23		Soil	Ice	J	1			X		
FS05	23-Sep-23		Soil	Ice	J	1			X		
FD06	23-Sep-23		Soil	Ice	J	1		X			
FS06	23-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD07	24-Sep-23		Soil	Ice	J	1			X		
FS07	24-Sep-23		Soil	Ice	J	1			X		
FD08	24-Sep-23		Soil	Ice	P	1		X			
FS08	24-Sep-23		Soil	Ice	P	1				X	Please forward to ALS for analysis
FB01	22-Sep-23		Water	Ice	P	1		X			
RB01	22-Sep-23		Water	Ice	P	1		X			
RB02	23-Sep-23		Water	Ice	P	1		X			
RB03	24-Sep-23		Water	Ice	P	1		X			
TOTAL NUMBER OF SAMPLES	113										
TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS:

SAMPLER				
GHD SERVICE CENTRE	Date/Time	Relinquished by:		Date/Time
Received by:	Date/Time	Relinquished by:		Date/Time
COURIER				

$1022.44

27/9/23

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address	Completion Date / Turnaround	Quote #
Level 4 - 211 Victoria Square, Adelaide SA 5000 Telephone: (08) 8111 6600	STANDARD	Quote GHD STANDARD RATES

Project Number 12618606	**Laboratory** Eurofins Environmental
Project Name MFE Peterborough DSI	**Laboratory Address** 9 Main Terrace, Richmond SA 5033
GHD Project Manager Tom Duncan	**Laboratory Contact** Parimal Acharya
GHD Contact Alls Kirkegaard	
GHD PM email Tom.Duncan@ghd.com	**GHD Contact email** Alls.Kirkegaard@ghd.com

COURIER AND LABORATORY INSTRUCTIONS:

- Sign chain of custody document on receipt and release of samples, between each party.
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and ESDAT format

Sample I.D.	Date and Time	Composite Sample	Sample Matrix (S: soil, SL: sludge W: water, A: air, GW: Groundwater)	Preservative	Containers: Type (J: soil jar, B: bag V: vial, G: glass bottle P: plastic bottle)	Containers: Number	Containers: Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	Analyses Required: HOLD	Analyses Required: SEND TO ALS

SAMPLE COMMENTS

Received by Courier:	Date/Time	Relinquished by:	Date/Time
LABORATORY			
Received by Lab:	Date/Time		

Tyrone Gowans

From: Amy Meunier
Sent: Wednesday, 27 September 2023 3:25 PM
To: #AU_CAU001_EnviroSampleVic
Subject: FW: Samples Received
Attachments: 12616806_CoC_Peterborough_DSI.pdf; 12616807_CoC_Port_Pirie_DSI.pdf

Follow Up Flag: Follow up
Flag Status: Completed

INFO: INTERNAL EMAIL - Sent from your own Eurofins email domain.

Hi Tyrone – COCs attached thanks

Kind regards,

Amy Meunier

Analytical Services Manager
Mobile : +61 477 574 867
Email : AmyMeunier@eurofins.com

Eurofins
6 Monterey Road,
Dandenong VIC 3175
Australia

My office hours are 9am to 5:30pm (Monday to Friday)
If you require sample receipt outside these hours please email envirosamplevic@eurofins.com



From: Ally Kirkman <Ally.Kirkman@ghd.com>
Sent: Wednesday, 27 September 2023 3:19 PM
To: Amy Meunier <AmyMeunier@eurofins.com>
Cc: Parimal Acharya <ParimalAcharya@eurofins.com>; Tom Duncan <Thomas.Duncan@ghd.com>
Subject: RE: Samples Received

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins. Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Amy,

Apologies for the delay. Attached are the COCs for each job.

Reach out if you have any questions.

Cheers,
Ally

From: Amy Meunier <AmyMeunier@eurofins.com>
Sent: Wednesday, September 27, 2023 9:16 AM

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PROJECT INFORMATION

Date Received:

Company: QHD

Contact person: Ally Kirkman

Contact Number:

Contact E-mail: #1029914

Project Name/site: 12616808

Project Number:

COC: Attached ☐
E-mailed ☐
Not received ☐

9.9°C
−0.3°C
9.6°C
on ice.

Last modified on: 16 October 2019	Approved on: 16 October 2019	Version: QS1039_R2
Last modified by: H. Le	Approver: M. Makarios	Page 1 of 1
Editorial Committee: T. Lakeland, F. Sanjaya, H. Le, M. Makarios		Next required review date: 16 October 2022

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www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Ally Kirkman
Project name:	MFS PETERBOROUGH DSI
Project ID:	12616806
Turnaround time:	5 Day
Date/Time received	Sep 27, 2023 3:25 PM
Eurofins reference	1029914

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✓	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

SAMPLES BH01_3.5. BH01_4.0 AND BH01_4.5 NOT RECEIVED. SAMPLE BH05_4.2 RECEIVED AS BH05_4.0

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Amy Meunier on phone : or by email: AmyMeunier@eurofins.com

Results will be delivered electronically via email to Ally Kirkman - ally.kirkman@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd SA email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

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NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
Adelaide
SA 5001

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	BH01_0.5	Sep 24, 2023		Soil	M23-Se0065095			X	X
2	BH01_2.0	Sep 24, 2023		Soil	M23-Se0065096			X	X
3	BH03_0.1	Sep 24, 2023		Soil	M23-Se0065097			X	X
4	BH03_1.5	Sep 24, 2023		Soil	M23-Se0065098			X	X
5	BH04_0.5	Sep 24, 2023		Soil	M23-Se0065099			X	X
6	BH04_2.5	Sep 24, 2023		Soil	M23-Se0065100			X	X
7	BH05_0.5	Sep 22, 2023		Soil	M23-Se0065101			X	X
8	BH05_2.5	Sep 22, 2023		Soil	M23-Se0065102			X	X
9	BH06_0.5	Sep 22, 2023		Soil	M23-Se0065103			X	X
10	BH06_3.5	Sep 22, 2023		Soil	M23-Se0065104			X	X
11	SS01	Sep 23, 2023		Soil	M23-Se0065105			X	X
12	SS02	Sep 23, 2023		Soil	M23-Se0065106			X	X
13	SS03	Sep 23, 2023		Soil	M23-Se0065107			X	X

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

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NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
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Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
Adelaide
SA 5001

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
14	SS04	Sep 23, 2023		Soil	M23-Se0065108			X	X
15	MW01_0.5	Sep 23, 2023		Soil	M23-Se0065109			X	X
16	MW01_4.5	Sep 23, 2023		Soil	M23-Se0065110			X	X
17	MW02_0.5	Sep 22, 2023		Soil	M23-Se0065111			X	X
18	MW02_5.5	Sep 21, 2023		Soil	M23-Se0065112			X	X
19	MW03_0.5	Sep 23, 2023		Soil	M23-Se0065113			X	X
20	MW03_3.0	Sep 23, 2023		Soil	M23-Se0065114			X	X
21	FD03	Sep 22, 2023		Soil	M23-Se0065115			X	X
22	FD04	Sep 23, 2023		Soil	M23-Se0065116			X	X
23	FD06	Sep 23, 2023		Soil	M23-Se0065117			X	X
24	FD08	Sep 24, 2023		Soil	M23-Se0065118			X	X
25	FB01	Sep 22, 2023		Water	M23-Se0065119				X
26	RB01	Sep 22, 2023		Water	M23-Se0065120				X
27	RB02	Sep 23, 2023		Water	M23-Se0065121				X
28	RB03	Sep 24, 2023		Water	M23-Se0065122				X
29	BH01_PAVER	Sep 24, 2023		Soil	M23-Se0065123		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
Adelaide
SA 5001

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
30	BH01_0.1	Sep 24, 2023		Soil	M23-Se0065124		X		
31	BH01_1.0	Sep 24, 2023		Soil	M23-Se0065125		X		
32	BH01_1.5	Sep 24, 2023		Soil	M23-Se0065126		X		
33	BH01_2.5	Sep 24, 2023		Soil	M23-Se0065127		X		
34	BH01_3.0	Sep 24, 2023		Soil	M23-Se0065128		X		
35	BH01_3.5	Sep 24, 2023		Soil	M23-Se0065129	X			
36	BH01_4.0	Sep 24, 2023		Soil	M23-Se0065130	X			
37	BH01_4.5	Sep 24, 2023		Soil	M23-Se0065131	X			
38	BH03_0.5	Sep 24, 2023		Soil	M23-Se0065132		X		
39	BH03_1.0	Sep 24, 2023		Soil	M23-Se0065133		X		
40	BH03_2.0	Sep 24, 2023		Soil	M23-Se0065134		X		
41	BH03_2.5	Sep 24, 2023		Soil	M23-Se0065135		X		
42	BH03_3.0	Sep 24, 2023		Soil	M23-Se0065136		X		
43	BH03_3.5	Sep 24, 2023		Soil	M23-Se0065137		X		
44	BH03_4.0	Sep 24, 2023		Soil	M23-Se0065138		X		
45	BH03_4.5	Sep 24, 2023		Soil	M23-Se0065139		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Project ID: 12616806

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Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
46	BH04_0.1	Sep 24, 2023		Soil	M23-Se0065140		X		
47	BH04_1.0	Sep 24, 2023		Soil	M23-Se0065141		X		
48	BH04_1.5	Sep 24, 2023		Soil	M23-Se0065142		X		
49	BH04_2.0	Sep 24, 2023		Soil	M23-Se0065143		X		
50	BH04_3.0	Sep 24, 2023		Soil	M23-Se0065144		X		
51	BH04_3.5	Sep 24, 2023		Soil	M23-Se0065145		X		
52	BH04_4.3	Sep 24, 2023		Soil	M23-Se0065146		X		
53	BH05_0.1	Sep 22, 2023		Soil	M23-Se0065147		X		
54	BH05_1.0	Sep 22, 2023		Soil	M23-Se0065148		X		
55	BH05_1.5	Sep 22, 2023		Soil	M23-Se0065149		X		
56	BH05_2.0	Sep 22, 2023		Soil	M23-Se0065150		X		
57	BH05_3.0	Sep 22, 2023		Soil	M23-Se0065151		X		
58	BH05_3.5	Sep 22, 2023		Soil	M23-Se0065152		X		
59	BH05_4.0	Sep 22, 2023		Soil	M23-Se0065153		X		
60	BH06_0.1	Sep 22, 2023		Soil	M23-Se0065154		X		
61	BH06_1.0	Sep 22, 2023		Soil	M23-Se0065155		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Received: Sep 27, 2023 3:25 PM
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Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
62	BH06_1.5	Sep 22, 2023		Soil	M23-Se0065156		X		
63	BH06_2.0	Sep 22, 2023		Soil	M23-Se0065157		X		
64	BH06_2.5	Sep 22, 2023		Soil	M23-Se0065158		X		
65	BH06_3.0	Sep 22, 2023		Soil	M23-Se0065159		X		
66	BH06_4.2	Sep 22, 2023		Soil	M23-Se0065160		X		
67	MW01_0.1	Sep 23, 2023		Soil	M23-Se0065161		X		
68	MW01_1.0	Sep 23, 2023		Soil	M23-Se0065162		X		
69	MW01_1.5	Sep 23, 2023		Soil	M23-Se0065163		X		
70	MW01_2.0	Sep 23, 2023		Soil	M23-Se0065164		X		
71	MW01_2.5	Sep 23, 2023		Soil	M23-Se0065165		X		
72	MW01_3.0	Sep 23, 2023		Soil	M23-Se0065166		X		
73	MW01_3.5	Sep 23, 2023		Soil	M23-Se0065167		X		
74	MW01_4.0	Sep 23, 2023		Soil	M23-Se0065168		X		
75	MW01_15	Sep 23, 2023		Soil	M23-Se0065169		X		
76	MW02_0.1	Sep 22, 2023		Soil	M23-Se0065170		X		
77	MW02_1.0	Sep 21, 2023		Soil	M23-Se0065171		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
78	MW02_1.5	Sep 21, 2023		Soil	M23-Se0065172		X		
79	MW02_2.0	Sep 21, 2023		Soil	M23-Se0065173		X		
80	MW02_2.5	Sep 21, 2023		Soil	M23-Se0065174		X		
81	MW02_3.0	Sep 21, 2023		Soil	M23-Se0065175		X		
82	MW02_3.5	Sep 21, 2023		Soil	M23-Se0065176		X		
83	MW02_4.0	Sep 21, 2023		Soil	M23-Se0065177		X		
84	MW02_4.5	Sep 21, 2023		Soil	M23-Se0065178		X		
85	MW02_5.0	Sep 21, 2023		Soil	M23-Se0065179		X		
86	MW02_6.0	Sep 21, 2023		Soil	M23-Se0065180		X		
87	MW02_6.5	Sep 21, 2023		Soil	M23-Se0065181		X		
88	MW02_7.0	Sep 21, 2023		Soil	M23-Se0065182		X		
89	MW02_7.5	Sep 21, 2023		Soil	M23-Se0065183		X		
90	MW02_8.0	Sep 21, 2023		Soil	M23-Se0065184		X		
91	MW02_8.5	Sep 21, 2023		Soil	M23-Se0065185		X		
92	MW02_9.0	Sep 21, 2023		Soil	M23-Se0065186		X		
93	MW02_9.5	Sep 21, 2023		Soil	M23-Se0065187		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Received: Sep 27, 2023 3:25 PM
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Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
94	MW02_10.0	Sep 21, 2023		Soil	M23-Se0065188		X		
95	MW02_12.0	Sep 21, 2023		Soil	M23-Se0065189		X		
96	MW02_15.0	Sep 21, 2023		Soil	M23-Se0065190		X		
97	MW03_0.1	Sep 23, 2023		Soil	M23-Se0065191		X		
98	MW03_1.0	Sep 23, 2023		Soil	M23-Se0065192		X		
99	MW03_1.5	Sep 23, 2023		Soil	M23-Se0065193		X		
100	MW03_2.0	Sep 23, 2023		Soil	M23-Se0065194		X		
101	MW03_2.5	Sep 23, 2023		Soil	M23-Se0065195		X		
102	MW03_3.5	Sep 23, 2023		Soil	M23-Se0065196		X		
103	MW03_14.0	Sep 23, 2023		Soil	M23-Se0065197		X		
104	FD01	Sep 22, 2023		Soil	M23-Se0065198		X		
105	FS01	Sep 22, 2023		Soil	M23-Se0065199		X		
106	FD02	Sep 22, 2023		Soil	M23-Se0065200		X		
107	FS02	Sep 22, 2023		Soil	M23-Se0065201		X		
108	FD05	Sep 23, 2023		Soil	M23-Se0065202		X		
109	FS05	Sep 23, 2023		Soil	M23-Se0065203		X		

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Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
110	FD07	Sep 24, 2023		Soil	M23-Se0065204		X		
111	FS07	Sep 24, 2023		Soil	M23-Se0065205		X		
Test Counts						3	80	24	28

GHD Pty Ltd
GPO Box 2052
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SA 5001

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Ally Kirkman**

Report **1029914-S**
Project name MFS PETERBOROUGH DSI
Project ID 12616806
Received Date Sep 27, 2023

Client Sample ID			**BH01_0.5**	**BH01_2.0**	**BH03_0.1**	**BH03_1.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M23-Se0065095**	**M23-Se0065096**	**M23-Se0065097**	**M23-Se0065098**
Date Sampled			**Sep 24, 2023**	**Sep 24, 2023**	**Sep 24, 2023**	**Sep 24, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	11	13	5.1	6.0
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	19
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	88	87	79	74
13C5-PFPeA (surr.)	1	%	99	98	98	91
13C5-PFHxA (surr.)	1	%	112	97	87	101
13C4-PFHpA (surr.)	1	%	106	89	100	98
13C8-PFOA (surr.)	1	%	99	98	104	105
13C5-PFNA (surr.)	1	%	97	92	99	99
13C6-PFDA (surr.)	1	%	107	106	106	108
13C2-PFUnDA (surr.)	1	%	112	112	115	115
13C2-PFDoDA (surr.)	1	%	120	110	111	114
13C2-PFTeDA (surr.)	1	%	93	84	88	90
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			BH01_0.5	BH01_2.0	BH03_0.1	BH03_1.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065095	M23-Se0065096	M23-Se0065097	M23-Se0065098
Date Sampled			Sep 24, 2023	Sep 24, 2023	Sep 24, 2023	Sep 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	112	111	104	103
D3-N-MeFOSA (surr.)	1	%	129	127	117	117
D5-N-EtFOSA (surr.)	1	%	132	132	122	117
D7-N-MeFOSE (surr.)	1	%	102	108	94	99
D9-N-EtFOSE (surr.)	1	%	99	100	93	100
D5-N-EtFOSAA (surr.)	1	%	120	135	102	99
D3-N-MeFOSAA (surr.)	1	%	104	116	100	95
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	[N09]9.0
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	[N09]7.4	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	[N09]7.0
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]6.9	5.1	< 5	[N09]71
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]230	[N09]120	[N09]150	[N09]85
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	[N09]6.7	< 5
13C3-PFBS (surr.)	1	%	100	94	96	92
18O2-PFHxS (surr.)	1	%	102	93	97	89
13C8-PFOS (surr.)	1	%	97	91	85	88
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	114	94	93	84
13C2-6:2 FTSA (surr.)	1	%	122	123	108	101
13C2-8:2 FTSA (surr.)	1	%	95	101	91	87
13C2-10:2 FTSA (surr.)	1	%	105	103	92	97
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	236.9	125.1	150	156
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	230	120	150	85
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	236.9	125.1	150	156
Sum of WA DWER PFAS (n=10)*	10	ug/kg	236.9	125.1	150	184
Sum of PFASs (n=30)*	50	ug/kg	236.9	125.1	164.1	191

Client Sample ID			BH04_0.5	BH04_2.5	BH05_0.5	BH05_2.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065099	M23-Se0065100	M23-Se0065101	M23-Se0065102
Date Sampled			Sep 24, 2023	Sep 24, 2023	Sep 22, 2023	Sep 22, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	12	6.2	9.0	10
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	5.6	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	5.7	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	81	82	91	96
13C5-PFPeA (surr.)	1	%	94	99	108	107
13C5-PFHxA (surr.)	1	%	89	98	116	134
13C4-PFHpA (surr.)	1	%	94	108	91	98
13C8-PFOA (surr.)	1	%	96	102	88	92
13C5-PFNA (surr.)	1	%	90	108	93	102
13C6-PFDA (surr.)	1	%	97	106	99	106
13C2-PFUnDA (surr.)	1	%	107	114	109	106
13C2-PFDoDA (surr.)	1	%	111	118	125	127
13C2-PFTeDA (surr.)	1	%	81	90	84	92
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	99	110	105	114
D3-N-MeFOSA (surr.)	1	%	110	124	110	118
D5-N-EtFOSA (surr.)	1	%	112	127	98	101
D7-N-MeFOSE (surr.)	1	%	89	99	89	96
D9-N-EtFOSE (surr.)	1	%	89	96	98	96
D5-N-EtFOSAA (surr.)	1	%	106	120	99	105
D3-N-MeFOSAA (surr.)	1	%	104	110	104	119
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	[N09]12	< 5	[N09]34	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]13	[N09]55	[N09]19	[N09]7.1
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			BH04_0.5	BH04_2.5	BH05_0.5	BH05_2.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065099	M23-Se0065100	M23-Se0065101	M23-Se0065102
Date Sampled			Sep 24, 2023	Sep 24, 2023	Sep 22, 2023	Sep 22, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]400	[N09]280	[N09]810	[N09]580
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	89	90	108	109
18O2-PFHxS (surr.)	1	%	86	94	102	103
13C8-PFOS (surr.)	1	%	102	121	137	108
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	62	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	91	99	87	87
13C2-6:2 FTSA (surr.)	1	%	107	106	89	95
13C2-8:2 FTSA (surr.)	1	%	86	97	100	99
13C2-10:2 FTSA (surr.)	1	%	92	106	122	137
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	413	335	829	587.1
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	400	280	810	580
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	413	335	829	587.1
Sum of WA DWER PFAS (n=10)*	10	ug/kg	486.3	335	829	587.1
Sum of PFASs (n=30)*	50	ug/kg	498.3	335	863	587.1

Client Sample ID			BH06_0.5	BH06_3.5	SS01	SS02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065103	M23-Se0065104	M23-Se0065105	M23-Se0065106
Date Sampled			Sep 22, 2023	Sep 22, 2023	Sep 23, 2023	Sep 23, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	12	15	6.7	4.0
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	5.1	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	93	89	82	81
13C5-PFPeA (surr.)	1	%	101	98	93	91
13C5-PFHxA (surr.)	1	%	117	113	106	102
13C4-PFHpA (surr.)	1	%	94	92	87	87

Client Sample ID			BH06_0.5	BH06_3.5	SS01	SS02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065103	M23-Se0065104	M23-Se0065105	M23-Se0065106
Date Sampled			Sep 22, 2023	Sep 22, 2023	Sep 23, 2023	Sep 23, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C8-PFOA (surr.)	1	%	90	87	83	82
13C5-PFNA (surr.)	1	%	94	91	90	86
13C6-PFDA (surr.)	1	%	102	106	93	94
13C2-PFUnDA (surr.)	1	%	112	109	99	100
13C2-PFDoDA (surr.)	1	%	126	119	115	115
13C2-PFTeDA (surr.)	1	%	80	84	85	91
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	117	113	94	100
D3-N-MeFOSA (surr.)	1	%	116	117	110	107
D5-N-EtFOSA (surr.)	1	%	105	97	95	96
D7-N-MeFOSE (surr.)	1	%	92	93	82	82
D9-N-EtFOSE (surr.)	1	%	97	96	84	84
D5-N-EtFOSAA (surr.)	1	%	104	102	96	98
D3-N-MeFOSAA (surr.)	1	%	108	104	89	93
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	[N09]9.6	< 5	< 5	[N09]16
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	[N09]42	< 5	[N09]22
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]510	< 5	[N09]100	[N09]330
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	[N09]17
13C3-PFBS (surr.)	1	%	109	102	97	96
18O2-PFHxS (surr.)	1	%	101	99	91	91
13C8-PFOS (surr.)	1	%	98	106	94	95
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	90	90	92	118
13C2-6:2 FTSA (surr.)	1	%	93	86	110	106
13C2-8:2 FTSA (surr.)	1	%	98	100	91	93
13C2-10:2 FTSA (surr.)	1	%	131	115	107	109

Client Sample ID			BH06_0.5	BH06_3.5	SS01	SS02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065103	M23-Se0065104	M23-Se0065105	M23-Se0065106
Date Sampled			Sep 22, 2023	Sep 22, 2023	Sep 23, 2023	Sep 23, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	510	42	100	352
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	510	< 5	100	330
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	510	42	100	352
Sum of WA DWER PFAS (n=10)*	10	ug/kg	510	47.1	100	352
Sum of PFASs (n=30)*	50	ug/kg	519.6	< 50	100	385

Client Sample ID			SS03	SS04	MW01_0.5	MW01_4.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065107	M23-Se0065108	M23-Se0065109	M23-Se0065110
Date Sampled			Sep 23, 2023	Sep 23, 2023	Sep 23, 2023	Sep 23, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	5.9	4.3	9.2	7.5
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	80	78	73	75
13C5-PFPeA (surr.)	1	%	87	84	77	77
13C5-PFHxA (surr.)	1	%	110	91	90	85
13C4-PFHpA (surr.)	1	%	87	77	76	68
13C8-PFOA (surr.)	1	%	78	68	65	65
13C5-PFNA (surr.)	1	%	84	76	73	63
13C6-PFDA (surr.)	1	%	97	79	71	71
13C2-PFUnDA (surr.)	1	%	96	78	75	73
13C2-PFDoDA (surr.)	1	%	110	89	81	70
13C2-PFTeDA (surr.)	1	%	85	67	66	54
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	6.1	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			SS03	SS04	MW01_0.5	MW01_4.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065107	M23-Se0065108	M23-Se0065109	M23-Se0065110
Date Sampled			Sep 23, 2023	Sep 23, 2023	Sep 23, 2023	Sep 23, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	99	79	76	76
D3-N-MeFOSA (surr.)	1	%	111	81	76	65
D5-N-EtFOSA (surr.)	1	%	95	67	63	55
D7-N-MeFOSE (surr.)	1	%	81	62	56	54
D9-N-EtFOSE (surr.)	1	%	79	62	57	53
D5-N-EtFOSAA (surr.)	1	%	97	80	73	70
D3-N-MeFOSAA (surr.)	1	%	96	76	76	69
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	[N09]7.5	< 5	[N09]20	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]7.0	< 5	[N09]21	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]180	[N09]59	[N09]810	[N09]65
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	[N09]10	< 5	[N09]7.7	< 5
13C3-PFBS (surr.)	1	%	98	85	81	75
18O2-PFHxS (surr.)	1	%	94	85	72	68
13C8-PFOS (surr.)	1	%	91	79	109	80
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	101	85	71	75
13C2-6:2 FTSA (surr.)	1	%	103	79	66	66
13C2-8:2 FTSA (surr.)	1	%	95	85	72	67
13C2-10:2 FTSA (surr.)	1	%	109	81	80	76
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	187	59	831	65
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	180	59	810	65
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	187	59	831	65
Sum of WA DWER PFAS (n=10)*	10	ug/kg	187	59	831	65
Sum of PFASs (n=30)*	50	ug/kg	204.5	59	864.8	65

Client Sample ID			MW02_0.5	MW02_5.5	MW03_0.5	MW03_3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065111	M23-Se0065112	M23-Se0065113	M23-Se0065114
Date Sampled			Sep 22, 2023	Sep 21, 2023	Sep 23, 2023	Sep 23, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	15	8.9	8.2	6.7
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	7.1
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	135	107	106	102
13C5-PFPeA (surr.)	1	%	133	122	121	116
13C5-PFHxA (surr.)	1	%	127	101	101	96
13C4-PFHpA (surr.)	1	%	120	98	99	94
13C8-PFOA (surr.)	1	%	130	93	92	89
13C5-PFNA (surr.)	1	%	101	96	96	95
13C6-PFDA (surr.)	1	%	114	91	95	90
13C2-PFUnDA (surr.)	1	%	116	120	123	116
13C2-PFDoDA (surr.)	1	%	124	109	113	105
13C2-PFTeDA (surr.)	1	%	107	95	98	92
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	101	100	112	104
D3-N-MeFOSA (surr.)	1	%	113	99	100	89
D5-N-EtFOSA (surr.)	1	%	124	108	117	103
D7-N-MeFOSE (surr.)	1	%	92	129	130	116
D9-N-EtFOSE (surr.)	1	%	90	111	118	114
D5-N-EtFOSAA (surr.)	1	%	144	137	121	113
D3-N-MeFOSAA (surr.)	1	%	142	128	125	111
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	[N09]5.6
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	[N09]6.0
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]22	[N09]10.0	< 5	[N09]38
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			MW02_0.5	MW02_5.5	MW03_0.5	MW03_3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065111	M23-Se0065112	M23-Se0065113	M23-Se0065114
Date Sampled			Sep 22, 2023	Sep 21, 2023	Sep 23, 2023	Sep 23, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]1100	< 5	[N09]390	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	127	93	95	86
18O2-PFHxS (surr.)	1	%	135	97	85	79
13C8-PFOS (surr.)	1	%	102	83	77	85
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	114	76	74	75
13C2-6:2 FTSA (surr.)	1	%	120	93	100	91
13C2-8:2 FTSA (surr.)	1	%	117	132	129	128
13C2-10:2 FTSA (surr.)	1	%	159	137	143	113
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	1122	10	390	38
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	1100	< 5	390	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	1122	10	390	38
Sum of WA DWER PFAS (n=10)*	10	ug/kg	1122	10	390	50.7
Sum of PFASs (n=30)*	50	ug/kg	1122	< 50	390	56.7

Client Sample ID			FD03	FD04	FD06	FD08
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065115	M23-Se0065116	M23-Se0065117	M23-Se0065118
Date Sampled			Sep 22, 2023	Sep 23, 2023	Sep 23, 2023	Sep 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	11	9.3	20	8.3
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	106	113	106	104
13C5-PFPeA (surr.)	1	%	124	125	122	118
13C5-PFHxA (surr.)	1	%	104	105	100	98
13C4-PFHpA (surr.)	1	%	100	105	101	96

Client Sample ID			FD03	FD04	FD06	FD08
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065115	M23-Se0065116	M23-Se0065117	M23-Se0065118
Date Sampled			Sep 22, 2023	Sep 23, 2023	Sep 23, 2023	Sep 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C8-PFOA (surr.)	1	%	93	98	94	89
13C5-PFNA (surr.)	1	%	95	101	94	93
13C6-PFDA (surr.)	1	%	91	91	90	91
13C2-PFUnDA (surr.)	1	%	120	126	115	117
13C2-PFDoDA (surr.)	1	%	111	116	111	108
13C2-PFTeDA (surr.)	1	%	98	111	92	96
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	105	105	103	103
D3-N-MeFOSA (surr.)	1	%	103	103	93	92
D5-N-EtFOSA (surr.)	1	%	115	115	113	106
D7-N-MeFOSE (surr.)	1	%	121	141	133	127
D9-N-EtFOSE (surr.)	1	%	107	116	113	109
D5-N-EtFOSAA (surr.)	1	%	115	125	112	124
D3-N-MeFOSAA (surr.)	1	%	118	132	121	126
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	5.6	[N09]18	< 5	[N09]12
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]580	< 5	[N09]43	[N09]230
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	97	98	98	90
18O2-PFHxS (surr.)	1	%	89	88	94	85
13C8-PFOS (surr.)	1	%	72	89	79	81
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	76	81	83	78
13C2-6:2 FTSA (surr.)	1	%	86	99	99	102
13C2-8:2 FTSA (surr.)	1	%	141	136	132	123
13C2-10:2 FTSA (surr.)	1	%	127	129	127	133

Client Sample ID			FD03	FD04	FD06	FD08
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065115	M23-Se0065116	M23-Se0065117	M23-Se0065118
Date Sampled			Sep 22, 2023	Sep 23, 2023	Sep 23, 2023	Sep 24, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	585.6	18	43	242
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	580	< 5	43	230
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	585.6	18	43	242
Sum of WA DWER PFAS (n=10)*	10	ug/kg	585.6	18	43	242
Sum of PFASs (n=30)*	50	ug/kg	585.6	< 50	< 50	242

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Sep 27, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Oct 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Oct 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Oct 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Oct 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Sep 27, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	BH01_0.5	Sep 24, 2023		Soil	M23-Se0065095			X	X
2	BH01_2.0	Sep 24, 2023		Soil	M23-Se0065096			X	X
3	BH03_0.1	Sep 24, 2023		Soil	M23-Se0065097			X	X
4	BH03_1.5	Sep 24, 2023		Soil	M23-Se0065098			X	X
5	BH04_0.5	Sep 24, 2023		Soil	M23-Se0065099			X	X
6	BH04_2.5	Sep 24, 2023		Soil	M23-Se0065100			X	X
7	BH05_0.5	Sep 22, 2023		Soil	M23-Se0065101			X	X
8	BH05_2.5	Sep 22, 2023		Soil	M23-Se0065102			X	X
9	BH06_0.5	Sep 22, 2023		Soil	M23-Se0065103			X	X
10	BH06_3.5	Sep 22, 2023		Soil	M23-Se0065104			X	X
11	SS01	Sep 23, 2023		Soil	M23-Se0065105			X	X
12	SS02	Sep 23, 2023		Soil	M23-Se0065106			X	X
13	SS03	Sep 23, 2023		Soil	M23-Se0065107			X	X

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Eurofins Environment Testing Australia Pty Ltd
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Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Site# 2370

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Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
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Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
14	SS04	Sep 23, 2023		Soil	M23-Se0065108			X	X
15	MW01_0.5	Sep 23, 2023		Soil	M23-Se0065109			X	X
16	MW01_4.5	Sep 23, 2023		Soil	M23-Se0065110			X	X
17	MW02_0.5	Sep 22, 2023		Soil	M23-Se0065111			X	X
18	MW02_5.5	Sep 21, 2023		Soil	M23-Se0065112			X	X
19	MW03_0.5	Sep 23, 2023		Soil	M23-Se0065113			X	X
20	MW03_3.0	Sep 23, 2023		Soil	M23-Se0065114			X	X
21	FD03	Sep 22, 2023		Soil	M23-Se0065115			X	X
22	FD04	Sep 23, 2023		Soil	M23-Se0065116			X	X
23	FD06	Sep 23, 2023		Soil	M23-Se0065117			X	X
24	FD08	Sep 24, 2023		Soil	M23-Se0065118			X	X
25	FB01	Sep 22, 2023		Water	M23-Se0065119				X
26	RB01	Sep 22, 2023		Water	M23-Se0065120				X
27	RB02	Sep 23, 2023		Water	M23-Se0065121				X
28	RB03	Sep 24, 2023		Water	M23-Se0065122				X
29	BH01_PAVER	Sep 24, 2023		Soil	M23-Se0065123		X		

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
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Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
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SA 5001

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
30	BH01_0.1	Sep 24, 2023		Soil	M23-Se0065124		X		
31	BH01_1.0	Sep 24, 2023		Soil	M23-Se0065125		X		
32	BH01_1.5	Sep 24, 2023		Soil	M23-Se0065126		X		
33	BH01_2.5	Sep 24, 2023		Soil	M23-Se0065127		X		
34	BH01_3.0	Sep 24, 2023		Soil	M23-Se0065128		X		
35	BH01_3.5	Sep 24, 2023		Soil	M23-Se0065129	X			
36	BH01_4.0	Sep 24, 2023		Soil	M23-Se0065130	X			
37	BH01_4.5	Sep 24, 2023		Soil	M23-Se0065131	X			
38	BH03_0.5	Sep 24, 2023		Soil	M23-Se0065132		X		
39	BH03_1.0	Sep 24, 2023		Soil	M23-Se0065133		X		
40	BH03_2.0	Sep 24, 2023		Soil	M23-Se0065134		X		
41	BH03_2.5	Sep 24, 2023		Soil	M23-Se0065135		X		
42	BH03_3.0	Sep 24, 2023		Soil	M23-Se0065136		X		
43	BH03_3.5	Sep 24, 2023		Soil	M23-Se0065137		X		
44	BH03_4.0	Sep 24, 2023		Soil	M23-Se0065138		X		
45	BH03_4.5	Sep 24, 2023		Soil	M23-Se0065139		X		

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Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
46	BH04_0.1	Sep 24, 2023		Soil	M23-Se0065140		X		
47	BH04_1.0	Sep 24, 2023		Soil	M23-Se0065141		X		
48	BH04_1.5	Sep 24, 2023		Soil	M23-Se0065142		X		
49	BH04_2.0	Sep 24, 2023		Soil	M23-Se0065143		X		
50	BH04_3.0	Sep 24, 2023		Soil	M23-Se0065144		X		
51	BH04_3.5	Sep 24, 2023		Soil	M23-Se0065145		X		
52	BH04_4.3	Sep 24, 2023		Soil	M23-Se0065146		X		
53	BH05_0.1	Sep 22, 2023		Soil	M23-Se0065147		X		
54	BH05_1.0	Sep 22, 2023		Soil	M23-Se0065148		X		
55	BH05_1.5	Sep 22, 2023		Soil	M23-Se0065149		X		
56	BH05_2.0	Sep 22, 2023		Soil	M23-Se0065150		X		
57	BH05_3.0	Sep 22, 2023		Soil	M23-Se0065151		X		
58	BH05_3.5	Sep 22, 2023		Soil	M23-Se0065152		X		
59	BH05_4.0	Sep 22, 2023		Soil	M23-Se0065153		X		
60	BH06_0.1	Sep 22, 2023		Soil	M23-Se0065154		X		
61	BH06_1.0	Sep 22, 2023		Soil	M23-Se0065155		X		

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Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
62	BH06_1.5	Sep 22, 2023		Soil	M23-Se0065156		X		
63	BH06_2.0	Sep 22, 2023		Soil	M23-Se0065157		X		
64	BH06_2.5	Sep 22, 2023		Soil	M23-Se0065158		X		
65	BH06_3.0	Sep 22, 2023		Soil	M23-Se0065159		X		
66	BH06_4.2	Sep 22, 2023		Soil	M23-Se0065160		X		
67	MW01_0.1	Sep 23, 2023		Soil	M23-Se0065161		X		
68	MW01_1.0	Sep 23, 2023		Soil	M23-Se0065162		X		
69	MW01_1.5	Sep 23, 2023		Soil	M23-Se0065163		X		
70	MW01_2.0	Sep 23, 2023		Soil	M23-Se0065164		X		
71	MW01_2.5	Sep 23, 2023		Soil	M23-Se0065165		X		
72	MW01_3.0	Sep 23, 2023		Soil	M23-Se0065166		X		
73	MW01_3.5	Sep 23, 2023		Soil	M23-Se0065167		X		
74	MW01_4.0	Sep 23, 2023		Soil	M23-Se0065168		X		
75	MW01_15	Sep 23, 2023		Soil	M23-Se0065169		X		
76	MW02_0.1	Sep 22, 2023		Soil	M23-Se0065170		X		
77	MW02_1.0	Sep 21, 2023		Soil	M23-Se0065171		X		

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Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1029914
Phone: 08 8111 6600
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Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
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Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
78	MW02_1.5	Sep 21, 2023		Soil	M23-Se0065172		X		
79	MW02_2.0	Sep 21, 2023		Soil	M23-Se0065173		X		
80	MW02_2.5	Sep 21, 2023		Soil	M23-Se0065174		X		
81	MW02_3.0	Sep 21, 2023		Soil	M23-Se0065175		X		
82	MW02_3.5	Sep 21, 2023		Soil	M23-Se0065176		X		
83	MW02_4.0	Sep 21, 2023		Soil	M23-Se0065177		X		
84	MW02_4.5	Sep 21, 2023		Soil	M23-Se0065178		X		
85	MW02_5.0	Sep 21, 2023		Soil	M23-Se0065179		X		
86	MW02_6.0	Sep 21, 2023		Soil	M23-Se0065180		X		
87	MW02_6.5	Sep 21, 2023		Soil	M23-Se0065181		X		
88	MW02_7.0	Sep 21, 2023		Soil	M23-Se0065182		X		
89	MW02_7.5	Sep 21, 2023		Soil	M23-Se0065183		X		
90	MW02_8.0	Sep 21, 2023		Soil	M23-Se0065184		X		
91	MW02_8.5	Sep 21, 2023		Soil	M23-Se0065185		X		
92	MW02_9.0	Sep 21, 2023		Soil	M23-Se0065186		X		
93	MW02_9.5	Sep 21, 2023		Soil	M23-Se0065187		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
94	MW02_10.0	Sep 21, 2023		Soil	M23-Se0065188		X		
95	MW02_12.0	Sep 21, 2023		Soil	M23-Se0065189		X		
96	MW02_15.0	Sep 21, 2023		Soil	M23-Se0065190		X		
97	MW03_0.1	Sep 23, 2023		Soil	M23-Se0065191		X		
98	MW03_1.0	Sep 23, 2023		Soil	M23-Se0065192		X		
99	MW03_1.5	Sep 23, 2023		Soil	M23-Se0065193		X		
100	MW03_2.0	Sep 23, 2023		Soil	M23-Se0065194		X		
101	MW03_2.5	Sep 23, 2023		Soil	M23-Se0065195		X		
102	MW03_3.5	Sep 23, 2023		Soil	M23-Se0065196		X		
103	MW03_14.0	Sep 23, 2023		Soil	M23-Se0065197		X		
104	FD01	Sep 22, 2023		Soil	M23-Se0065198		X		
105	FS01	Sep 22, 2023		Soil	M23-Se0065199		X		
106	FD02	Sep 22, 2023		Soil	M23-Se0065200		X		
107	FS02	Sep 22, 2023		Soil	M23-Se0065201		X		
108	FD05	Sep 23, 2023		Soil	M23-Se0065202		X		
109	FS05	Sep 23, 2023		Soil	M23-Se0065203		X		

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Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
110	FD07	Sep 24, 2023		Soil	M23-Se0065204		X		
111	FS07	Sep 24, 2023		Soil	M23-Se0065205		X		
Test Counts						3	80	24	28

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**µg/L:** micrograms per litre
ppm: parts per million	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	85			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	70			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	92			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	82			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	99			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	85			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	87			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	96			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	87			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	97			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	92			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	90			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	88			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	86			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	86			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	86			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	78			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	87			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	72			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	100			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	83			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	73			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	88			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	74			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	74			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	91			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	81			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	85			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Se0065108	CP	%	75			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0065108	CP	%	68			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0065108	CP	%	89			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0065108	CP	%	81			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0065108	CP	%	85			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0065108	CP	%	88			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0065108	CP	%	86			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0065108	CP	%	89			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0065108	CP	%	86			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0065108	CP	%	86			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0065108	CP	%	92			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Se0065108	CP	%	88			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0065108	CP	%	91			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0065108	CP	%	91			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0065108	CP	%	83			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0065108	CP	%	87			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0065108	CP	%	81			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0065108	CP	%	85			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Se0065108	CP	%	65			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0065108	CP	%	83			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0065108	CP	%	76			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0065108	CP	%	65			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0065108	CP	%	82			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0065108	CP	%	79			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0065108	CP	%	102			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0065108	CP	%	81			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Se0065108	CP	%	77			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0065108	CP	%	85			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0065108	CP	%	87			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0065108	CP	%	86			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Se0065118	CP	%	80			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0065118	CP	%	81			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0065118	CP	%	81			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0065118	CP	%	75			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0065118	CP	%	82			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0065118	CP	%	82			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0065118	CP	%	76			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0065118	CP	%	77			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0065118	CP	%	74			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0065118	CP	%	69			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0065118	CP	%	74			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Se0065118	CP	%	82			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0065118	CP	%	79			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0065118	CP	%	83			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0065118	CP	%	73			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0065118	CP	%	78			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0065118	CP	%	74			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0065118	CP	%	78			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Se0065118	CP	%	73			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0065118	CP	%	79			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0065118	CP	%	91			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0065118	CP	%	72			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0065118	CP	%	75			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0065118	CP	%	54			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0065118	CP	%	78			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Se0065118	CP	%	73			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0065118	CP	%	70			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0065118	CP	%	78			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0065118	CP	%	84			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0065096	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0065096	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0065096	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-Se0065104	CP	%	15	14	13	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0065107	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0065107	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0065107	CP	ug/kg	7.5	6.7	11	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0065107	CP	ug/kg	7.0	6.2	13	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0065107	CP	ug/kg	180	160	12	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0065107	CP	ug/kg	10	8.7	17	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0065107	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-Se0065114	CP	%	6.7	8.2	20	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0065117	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0065117	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0065117	CP	ug/kg	43	46	7.4	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0065117	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Amy Meunier	Analytical Services Manager
Joseph Edouard	Senior Analyst-PFAS
Mary Makarios	Senior Analyst-Sample Properties



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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GHD Pty Ltd
GPO Box 2052
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NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Ally Kirkman**

Report **1029914-W**
Project name MFS PETERBOROUGH DSI
Project ID 12616806
Received Date Sep 27, 2023

Client Sample ID			**FB01**	**RB01**	**RB02**	**RB03**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**M23-Se0065119**	**M23-Se0065120**	**M23-Se0065121**	**M23-Se0065122**
Date Sampled			**Sep 22, 2023**	**Sep 22, 2023**	**Sep 23, 2023**	**Sep 24, 2023**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	57	108	56	82
13C5-PFPeA (surr.)	1	%	121	109	113	113
13C5-PFHxA (surr.)	1	%	106	94	98	98
13C4-PFHpA (surr.)	1	%	96	82	90	91
13C8-PFOA (surr.)	1	%	89	76	84	96
13C5-PFNA (surr.)	1	%	79	63	70	86
13C6-PFDA (surr.)	1	%	61	53	66	78
13C2-PFUnDA (surr.)	1	%	51	48	55	72
13C2-PFDoDA (surr.)	1	%	51	44	53	60
13C2-PFTeDA (surr.)	1	%	56	47	61	63
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	55	58	50	60
D3-N-MeFOSA (surr.)	1	%	27	73	34	38

Client Sample ID			FB01	RB01	RB02	RB03
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M23-Se0065119	M23-Se0065120	M23-Se0065121	M23-Se0065122
Date Sampled			Sep 22, 2023	Sep 22, 2023	Sep 23, 2023	Sep 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	28	72	35	47
D7-N-MeFOSE (surr.)	1	%	30	72	41	53
D9-N-EtFOSE (surr.)	1	%	39	67	42	61
D5-N-EtFOSAA (surr.)	1	%	43	39	83	62
D3-N-MeFOSAA (surr.)	1	%	46	47	54	66
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	101	87	95	93
18O2-PFHxS (surr.)	1	%	86	78	86	88
13C8-PFOS (surr.)	1	%	66	61	69	83
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	97	70	75	78
13C2-6:2 FTSA (surr.)	1	%	112	75	73	76
13C2-8:2 FTSA (surr.)	1	%	45	35	48	55
13C2-10:2 FTSA (surr.)	1	%	53	48	144	73
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	< 0.1	< 0.1	< 0.1

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Oct 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Oct 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Oct 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Oct 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Sep 27, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
Adelaide
SA 5001

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	BH01_0.5	Sep 24, 2023		Soil	M23-Se0065095			X	X
2	BH01_2.0	Sep 24, 2023		Soil	M23-Se0065096			X	X
3	BH03_0.1	Sep 24, 2023		Soil	M23-Se0065097			X	X
4	BH03_1.5	Sep 24, 2023		Soil	M23-Se0065098			X	X
5	BH04_0.5	Sep 24, 2023		Soil	M23-Se0065099			X	X
6	BH04_2.5	Sep 24, 2023		Soil	M23-Se0065100			X	X
7	BH05_0.5	Sep 22, 2023		Soil	M23-Se0065101			X	X
8	BH05_2.5	Sep 22, 2023		Soil	M23-Se0065102			X	X
9	BH06_0.5	Sep 22, 2023		Soil	M23-Se0065103			X	X
10	BH06_3.5	Sep 22, 2023		Soil	M23-Se0065104			X	X
11	SS01	Sep 23, 2023		Soil	M23-Se0065105			X	X
12	SS02	Sep 23, 2023		Soil	M23-Se0065106			X	X
13	SS03	Sep 23, 2023		Soil	M23-Se0065107			X	X

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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
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SA 5001

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
14	SS04	Sep 23, 2023		Soil	M23-Se0065108			X	X
15	MW01_0.5	Sep 23, 2023		Soil	M23-Se0065109			X	X
16	MW01_4.5	Sep 23, 2023		Soil	M23-Se0065110			X	X
17	MW02_0.5	Sep 22, 2023		Soil	M23-Se0065111			X	X
18	MW02_5.5	Sep 21, 2023		Soil	M23-Se0065112			X	X
19	MW03_0.5	Sep 23, 2023		Soil	M23-Se0065113			X	X
20	MW03_3.0	Sep 23, 2023		Soil	M23-Se0065114			X	X
21	FD03	Sep 22, 2023		Soil	M23-Se0065115			X	X
22	FD04	Sep 23, 2023		Soil	M23-Se0065116			X	X
23	FD06	Sep 23, 2023		Soil	M23-Se0065117			X	X
24	FD08	Sep 24, 2023		Soil	M23-Se0065118			X	X
25	FB01	Sep 22, 2023		Water	M23-Se0065119				X
26	RB01	Sep 22, 2023		Water	M23-Se0065120				X
27	RB02	Sep 23, 2023		Water	M23-Se0065121				X
28	RB03	Sep 24, 2023		Water	M23-Se0065122				X
29	BH01_PAVER	Sep 24, 2023		Soil	M23-Se0065123		X		

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Eurofins Environment Testing Australia Pty Ltd
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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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IANZ# 1327	IANZ# 1290	IANZ# 1402

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Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
30	BH01_0.1	Sep 24, 2023		Soil	M23-Se0065124		X		
31	BH01_1.0	Sep 24, 2023		Soil	M23-Se0065125		X		
32	BH01_1.5	Sep 24, 2023		Soil	M23-Se0065126		X		
33	BH01_2.5	Sep 24, 2023		Soil	M23-Se0065127		X		
34	BH01_3.0	Sep 24, 2023		Soil	M23-Se0065128		X		
35	BH01_3.5	Sep 24, 2023		Soil	M23-Se0065129	X			
36	BH01_4.0	Sep 24, 2023		Soil	M23-Se0065130	X			
37	BH01_4.5	Sep 24, 2023		Soil	M23-Se0065131	X			
38	BH03_0.5	Sep 24, 2023		Soil	M23-Se0065132		X		
39	BH03_1.0	Sep 24, 2023		Soil	M23-Se0065133		X		
40	BH03_2.0	Sep 24, 2023		Soil	M23-Se0065134		X		
41	BH03_2.5	Sep 24, 2023		Soil	M23-Se0065135		X		
42	BH03_3.0	Sep 24, 2023		Soil	M23-Se0065136		X		
43	BH03_3.5	Sep 24, 2023		Soil	M23-Se0065137		X		
44	BH03_4.0	Sep 24, 2023		Soil	M23-Se0065138		X		
45	BH03_4.5	Sep 24, 2023		Soil	M23-Se0065139		X		

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Company Name: GHD Pty Ltd SA
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Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
46	BH04_0.1	Sep 24, 2023		Soil	M23-Se0065140		X		
47	BH04_1.0	Sep 24, 2023		Soil	M23-Se0065141		X		
48	BH04_1.5	Sep 24, 2023		Soil	M23-Se0065142		X		
49	BH04_2.0	Sep 24, 2023		Soil	M23-Se0065143		X		
50	BH04_3.0	Sep 24, 2023		Soil	M23-Se0065144		X		
51	BH04_3.5	Sep 24, 2023		Soil	M23-Se0065145		X		
52	BH04_4.3	Sep 24, 2023		Soil	M23-Se0065146		X		
53	BH05_0.1	Sep 22, 2023		Soil	M23-Se0065147		X		
54	BH05_1.0	Sep 22, 2023		Soil	M23-Se0065148		X		
55	BH05_1.5	Sep 22, 2023		Soil	M23-Se0065149		X		
56	BH05_2.0	Sep 22, 2023		Soil	M23-Se0065150		X		
57	BH05_3.0	Sep 22, 2023		Soil	M23-Se0065151		X		
58	BH05_3.5	Sep 22, 2023		Soil	M23-Se0065152		X		
59	BH05_4.0	Sep 22, 2023		Soil	M23-Se0065153		X		
60	BH06_0.1	Sep 22, 2023		Soil	M23-Se0065154		X		
61	BH06_1.0	Sep 22, 2023		Soil	M23-Se0065155		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Project ID: 12616806

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Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
62	BH06_1.5	Sep 22, 2023		Soil	M23-Se0065156		X		
63	BH06_2.0	Sep 22, 2023		Soil	M23-Se0065157		X		
64	BH06_2.5	Sep 22, 2023		Soil	M23-Se0065158		X		
65	BH06_3.0	Sep 22, 2023		Soil	M23-Se0065159		X		
66	BH06_4.2	Sep 22, 2023		Soil	M23-Se0065160		X		
67	MW01_0.1	Sep 23, 2023		Soil	M23-Se0065161		X		
68	MW01_1.0	Sep 23, 2023		Soil	M23-Se0065162		X		
69	MW01_1.5	Sep 23, 2023		Soil	M23-Se0065163		X		
70	MW01_2.0	Sep 23, 2023		Soil	M23-Se0065164		X		
71	MW01_2.5	Sep 23, 2023		Soil	M23-Se0065165		X		
72	MW01_3.0	Sep 23, 2023		Soil	M23-Se0065166		X		
73	MW01_3.5	Sep 23, 2023		Soil	M23-Se0065167		X		
74	MW01_4.0	Sep 23, 2023		Soil	M23-Se0065168		X		
75	MW01_15	Sep 23, 2023		Soil	M23-Se0065169		X		
76	MW02_0.1	Sep 22, 2023		Soil	M23-Se0065170		X		
77	MW02_1.0	Sep 21, 2023		Soil	M23-Se0065171		X		

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Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
78	MW02_1.5	Sep 21, 2023		Soil	M23-Se0065172		X		
79	MW02_2.0	Sep 21, 2023		Soil	M23-Se0065173		X		
80	MW02_2.5	Sep 21, 2023		Soil	M23-Se0065174		X		
81	MW02_3.0	Sep 21, 2023		Soil	M23-Se0065175		X		
82	MW02_3.5	Sep 21, 2023		Soil	M23-Se0065176		X		
83	MW02_4.0	Sep 21, 2023		Soil	M23-Se0065177		X		
84	MW02_4.5	Sep 21, 2023		Soil	M23-Se0065178		X		
85	MW02_5.0	Sep 21, 2023		Soil	M23-Se0065179		X		
86	MW02_6.0	Sep 21, 2023		Soil	M23-Se0065180		X		
87	MW02_6.5	Sep 21, 2023		Soil	M23-Se0065181		X		
88	MW02_7.0	Sep 21, 2023		Soil	M23-Se0065182		X		
89	MW02_7.5	Sep 21, 2023		Soil	M23-Se0065183		X		
90	MW02_8.0	Sep 21, 2023		Soil	M23-Se0065184		X		
91	MW02_8.5	Sep 21, 2023		Soil	M23-Se0065185		X		
92	MW02_9.0	Sep 21, 2023		Soil	M23-Se0065186		X		
93	MW02_9.5	Sep 21, 2023		Soil	M23-Se0065187		X		

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Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
94	MW02_10.0	Sep 21, 2023		Soil	M23-Se0065188		X		
95	MW02_12.0	Sep 21, 2023		Soil	M23-Se0065189		X		
96	MW02_15.0	Sep 21, 2023		Soil	M23-Se0065190		X		
97	MW03_0.1	Sep 23, 2023		Soil	M23-Se0065191		X		
98	MW03_1.0	Sep 23, 2023		Soil	M23-Se0065192		X		
99	MW03_1.5	Sep 23, 2023		Soil	M23-Se0065193		X		
100	MW03_2.0	Sep 23, 2023		Soil	M23-Se0065194		X		
101	MW03_2.5	Sep 23, 2023		Soil	M23-Se0065195		X		
102	MW03_3.5	Sep 23, 2023		Soil	M23-Se0065196		X		
103	MW03_14.0	Sep 23, 2023		Soil	M23-Se0065197		X		
104	FD01	Sep 22, 2023		Soil	M23-Se0065198		X		
105	FS01	Sep 22, 2023		Soil	M23-Se0065199		X		
106	FD02	Sep 22, 2023		Soil	M23-Se0065200		X		
107	FS02	Sep 22, 2023		Soil	M23-Se0065201		X		
108	FD05	Sep 23, 2023		Soil	M23-Se0065202		X		
109	FS05	Sep 23, 2023		Soil	M23-Se0065203		X		

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Received: Sep 27, 2023 3:25 PM
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Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
110	FD07	Sep 24, 2023		Soil	M23-Se0065204		X		
111	FS07	Sep 24, 2023		Soil	M23-Se0065205		X		
Test Counts						3	80	24	28

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**µg/L:** micrograms per litre
ppm: parts per million	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	73			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	72			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	71			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	66			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	64			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	66			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	79			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	69			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	73			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	60			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	79			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	79			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	89			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	86			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	67			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	69			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	70			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	73			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	72			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	68			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	69			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	67			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	68			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	68			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	70			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	60			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	69			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	75			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	67			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	69			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Oc0001040	NCP	%	75			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Oc0001040	NCP	%	74			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Oc0001040	NCP	%	74			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Oc0001040	NCP	%	66			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Oc0001040	NCP	%	65			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Oc0001040	NCP	%	64			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Oc0001040	NCP	%	78			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Oc0001040	NCP	%	67			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Oc0001040	NCP	%	73			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Oc0001040	NCP	%	55			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Oc0001040	NCP	%	74			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Oc0001040	NCP	%	87			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Oc0001040	NCP	%	75			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Oc0001040	NCP	%	98			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Oc0001040	NCP	%	68			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Oc0001040	NCP	%	71			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Oc0001040	NCP	%	74			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Oc0001040	NCP	%	76			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Oc0001040	NCP	%	75			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Oc0001040	NCP	%	65			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Oc0001040	NCP	%	77			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Oc0001040	NCP	%	67			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Oc0001040	NCP	%	68			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Oc0001040	NCP	%	76			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Oc0001040	NCP	%	69			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Oc0001040	NCP	%	56			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Oc0001040	NCP	%	69			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Oc0001040	NCP	%	80			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Oc0001040	NCP	%	75			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Oc0001040	NCP	%	75			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Se0065244	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Se0065244	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0065244	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0065244	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0065244	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0065244	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0065244	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0065244	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0065244	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0065244	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Amy Meunier	Analytical Services Manager
Joseph Edouard	Senior Analyst-PFAS



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address
Level 4 - 211 Victoria Square, Adelaide SA 5000
Telephone: (08) 8111 6800

Completion Date / Turnaround: STANDARD

Quote #: Quote GHD STANDARD RATES

Project Number: 12618606
Project Name: MFS Peterborough DSI
GHD Project Manager: Tom Duncan
GHD Contact: Ally Kinsman
GHD PM email: Tom.Duncan@ghd.com
GHD Contact email: Ally.Kinsman@ghd.com

Laboratory: Eurofins Environmental
Laboratory Address: 6 Mars Terrace, Richmond SA 5033
Laboratory Contact: Parimal Acharya

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on receipt and release of samples, between each party.
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and ESDAT format.

Sample I.D.	Date and Time	Composite Sample	Sample Matrix (S: Soil, W: Water, A: Air, Other: Specify)	Preservative	Containers: Type (J: soil jar, B: bag, V: vial, G: glass bottle, P: plastic bottle)	Containers: Number	Containers: Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ALS	SAMPLE COMMENTS
BH01_paver	24-Sep-23		Soil	Ice	J	1			X		
BH01_0.1	24-Sep-23		Soil	Ice	J	1			X		
BH01_0.5	24-Sep-23		Soil	Ice	J	1		X			
BH01_1.0	24-Sep-23		Soil	Ice	J	1			X		
BH01_1.5	24-Sep-23		Soil	Ice	J	1			X		
BH01_2.0	24-Sep-23		Soil	Ice	J	1		X			
BH01_2.5	24-Sep-23		Soil	Ice	J	1			X		
BH01_3.0	24-Sep-23		Soil	Ice	J	1			X		
BH01_3.5	24-Sep-23		Soil	Ice	J	1			X		
BH01_4.0	24-Sep-23		Soil	Ice	J	1			X		
BH01_4.5	24-Sep-23		Soil	Ice	J	1			X		
BH03_0.1	24-Sep-23		Soil	Ice	J	1		X			
BH03_0.5	24-Sep-23		Soil	Ice	J	1			X		
BH03_1.0	24-Sep-23		Soil	Ice	J	1			X		
BH03_1.5	24-Sep-23		Soil	Ice	J	1		X			
BH03_2.0	24-Sep-23		Soil	Ice	J	1			X		
BH03_2.5	24-Sep-23		Soil	Ice	J	1			X		
BH03_3.0	24-Sep-23		Soil	Ice	J	1			X		
BH03_3.5	24-Sep-23		Soil	Ice	J	1			X		
BH03_4.0	24-Sep-23		Soil	Ice	J	1			X		
BH03_4.5	24-Sep-23		Soil	Ice	J	1			X		
BH04_0.1	24-Sep-23		Soil	Ice	J	1			X		
BH04_0.5	24-Sep-23		Soil	Ice	J	1		X			
BH04_1.0	24-Sep-23		Soil	Ice	J	1			X		
BH04_1.5	24-Sep-23		Soil	Ice	J	1			X		
TOTAL NUMBER OF SAMPLES	113										
TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS

SAMPLER			
	Date/Time	Relinquished by	Date/Time
GHD SERVICE CENTRE			
Received by	Date/Time	Relinquished by	Date/Time
COURIER			

#1029914

27/9/23

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address	Completion Date / Turnaround	Quote #
Level 4 - 211 Victoria Square, Adelaide SA 5000 Telephone: (08) 8111 6600	STANDARD	Quote GHD STANDARD RATES

Project Number: 12618606	Laboratory: Eurofins Environmental
Project Name: MFS Peterborough DBI	Laboratory Address: 1 Main Terrace Richmond SA 5033
GHD Project Manager: Tom Duncan	Laboratory Contact: Amy Mounker
GHD Contact: Ally Kinman	
GHD PM email: Tom.Duncan@ghd.com	GHD Contact email: Ally.Kinman@ghd.com

COURIER AND LABORATORY INSTRUCTIONS:

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- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and ESDAT format.

Sample I.D.	Date and Time	Composite Sample	Sample Matrix W: Soil WI: Soluble Water GW: Groundwater	Preservative	Containers: Type J: soil jar B: bag V: vial G: glass bottle P: plastic cabin	Containers: Number	Containers: Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO EUROFINS	SAMPLE COMMENTS
BH04_2.0	24-Sep-23		Soil	Ice	J	1			X		
BH04_2.5	24-Sep-23		Soil	Ice	J	1		X			
BH04_3.0	24-Sep-23		Soil	Ice	J	1			X		
BH04_3.5	24-Sep-23		Soil	Ice	J	1			X		
BH04_4.3	24-Sep-23		Soil	Ice	J	1			X		
BH05_0.1	22-Sep-23		Soil	Ice	J	1			X		
BH05_0.5	22-Sep-23		Soil	Ice	J	1		X			
BH05_1.0	22-Sep-23		Soil	Ice	J	1			X		
BH05_1.5	22-Sep-23		Soil	Ice	J	1			X		
BH05_2.0	22-Sep-23		Soil	Ice	J	1			X		
BH05_2.5	22-Sep-23		Soil	Ice	J	1		X			
BH05_3.0	22-Sep-23		Soil	Ice	J	1			X		
BH05_3.5	22-Sep-23		Soil	Ice	J	1			X		
BH05_4.2	22-Sep-23		Soil	Ice	J	1			X		
BH06_0.1	22-Sep-23		Soil	Ice	J	1			X		
BH06_0.5	22-Sep-23		Soil	Ice	J	1		X			
BH06_1.0	22-Sep-23		Soil	Ice	J	1			X		
BH06_1.5	22-Sep-23		Soil	Ice	J	1			X		
BH06_2.0	22-Sep-23		Soil	Ice	J	1			X		
BH06_2.5	22-Sep-23		Soil	Ice	J	1			X		
BH06_3.0	22-Sep-23		Soil	Ice	J	1			X		
BH06_3.5	22-Sep-23		Soil	Ice	J	1		X			
BH06_4.2	22-Sep-23		Soil	Ice	J	1			X		
TOTAL NUMBER OF SAMPLES	113										
TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS			
SAMPLER			
	Date/Time	Relinquished by	Date/Time
GHD SERVICE CENTRE			
Received by:	Date/Time	Relinquished by	Date/Time
COURIER			
Received by: Courier:	Date/Time	Relinquished by	Date/Time
LABORATORY			
Received by Lab:	Date/Time		

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address	Completion Date / Turnaround	Quote #
Level 4 - 211 Victoria Square, Adelaide SA 5000 Telephone: (08) 8111 6600	STANDARD	Quote GHD STANDARD RATES

Project Number	**Laboratory**
12511806	Eurofins Environmental
Project Name	**Laboratory Address**
MFB Peterborough DSI	6 Main Terrace, Richmond SA 5033
GHD Project Manager	**Laboratory Contact**
Tom Dunstan	Amy Meunier
GHD Contact	
Ally Kirkman	
GHD PM email	**GHD Contact email**
Tom.Dunstan@ghd.com	Ally.Kirkman@ghd.com

COURIER AND LABORATORY INSTRUCTIONS:

- Sign chain of custody document on receipt and release of samples, between each party.
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and ESDAT format.

Sample I.D.	Date and Time	Composite Sample	Sample Matrix (S: Soil, SED: Sediment, W: Water, A: Air, GW: Groundwater)	Preservative	Containers: Type (J: soil jar, B: bag, V: vial, G: glass bottle, P: plastic bottle)	Containers: Number	Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO EUROFINS	SAMPLE COMMENTS
SS01	23-Sep-23		Soil	Ice	J	1		X			
SS02	23-Sep-23		Soil	Ice	J	1		X			
SS03	23-Sep-23		Soil	Ice	J	1		X			
SS04	23-Sep-23		Soil	Ice	J	1		X			
MW01_0.1	23-Sep-23		Soil	Ice	J	1			X		
MW01_0.5	23-Sep-23		Soil	Ice	J	1		X			
MW01_1.0	23-Sep-23		Soil	Ice	J	1			X		
MW01_1.5	23-Sep-23		Soil	Ice	J	1			X		
MW01_2.0	23-Sep-23		Soil	Ice	J	1			X		
MW01_2.5	23-Sep-23		Soil	Ice	J	1			X		
MW01_3.0	23-Sep-23		Soil	Ice	J	1			X		
MW01_3.5	23-Sep-23		Soil	Ice	J	1			X		
MW01_4.0	23-Sep-23		Soil	Ice	J	1			X		
MW01_4.5	23-Sep-23		Soil	Ice	J	1		X			
MW01_15	23-Sep-23		Soil	Ice	J	1			X		
MW02_0.1	22-Sep-23		Soil	Ice	J	1			X		
MW02_0.5	22-Sep-23		Soil	Ice	J	1		X			
MW02_1.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_1.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_2.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_2.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_3.0	21-Sep-23		Soil	Ice	J	1			X		
TOTAL NUMBER OF SAMPLES	114										
TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS			
SAMPLER	Date/Time	Relinquished by:	Date/Time
GHD SERVICE CENTRE			
Received by:	Date/Time	Relinquished by:	Date/Time
COURIER			
Received by Courier:	Date/Time	Relinquished by:	Date/Time
LABORATORY			
Received by Lab:	Date/Time		

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address	Completion Date / Turnaround	Quote #
Level 4 - 211 Victoria Square, Adelaide SA 5000 Telephone: (08) 8111 6600	STANDARD	Quote GHD STANDARD RATES

Project Number	12516806
Project Name	MFS Peterborough DSI
GHD Project Manager	Tom Duncan
GHD Contact	Ally Kirkman
GHD PM email	Tom.Duncan@ghd.com
GHD Contact email	Ally.Kirkman@ghd.com
Laboratory	Eurofins Environmental
Laboratory Address	9 Main Terrace, Richmond SA 5033
Laboratory Contact	Amy Meunier

COURIER AND LABORATORY INSTRUCTIONS:

- Sign chain of custody document on receipt and release of samples, between each party
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.

All results should reference the Job Number and Project Name.

All results should be provided in NATA accredited pdf format and EDDAT format.

Sample I.D.	Date and Time	Composite Sample	Sample Matrix (S: Soil, W: Water, A: Air, GW: Groundwater)	Preservative	Containers: Type (J: acid jar, B: bag, V: vial, G: glass bottle, P: plastic bottle)	Containers: Number	Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO EUROFINS	SAMPLE COMMENTS
MW02_3.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_4.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_4.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_5.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_5.5	21-Sep-23		Soil	Ice	J	1		X			
MW02_6.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_6.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_7.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_7.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_8.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_8.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_9.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_9.5	21-Sep-23		Soil	Ice	J	1			X		
MW02_10.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_12.0	21-Sep-23		Soil	Ice	J	1			X		
MW02_15.0	21-Sep-23		Soil	Ice	J	1			X		
MW03_0.1	23-Sep-23		Soil	Ice	J	1			X		
MW03_0.5	23-Sep-23		Soil	Ice	J	1		X			
MW03_1.0	23-Sep-23		Soil	Ice	J	1			X		
MW03_1.5	23-Sep-23		Soil	Ice	J	1			X		
TOTAL NUMBER OF SAMPLES	113										
TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS			
SAMPLER			
	Date/Time	Relinquished by	Date/Time
GHD SERVICE CENTRE			
Received by:	Date/Time	Relinquished by:	Date/Time
COURIER			
Received by Courier:	Date/Time	Relinquished by:	Date/Time
LABORATORY			
Received by Lab:	Date/Time		

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address	Completion Date / Turnaround	Quote #
Level 4 - 211 Victoria Square, Adelaide SA 5000 Telephone: (08) 8111 6800	STANDARD	Quote GHD STANDARD RATES

Project Number 12616806	Laboratory Eurofins Environmental
Project Name MFB Peterborough DSI	Laboratory Address 9 Main Terrace, Richmond SA 5033
GHD Project Manager Tom Dunnan	Laboratory Contact Pannal Acharya
GHD Contact Ally Kirkman	
GHD PM email Tom.Dunnan@ghd.com	GHD Contact email Ally.Kirkman@ghd.com

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on reciept and release of samples, between each party
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of reciept.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and ESDAT format.

Sample I.D.	Date and Time	Composite Sample	Sample Matrix (S: soil, W: water, A: Air, GW: Groundwater)	Preservative	Containers: Type (J: soil jar, G: glass bottle, P: plastic bottle, B: bag)	Containers: Number	Containers: Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ALS	SAMPLE COMMENTS
MW03_2.0	23-Sep-23		Soil	Ice	J	1			X		
MW03_2.5	23-Sep-23		Soil	Ice	J	1			X		
MW03_3.0	23-Sep-23		Soil	Ice	J	1		X			
MW03_3.5	23-Sep-23		Soil	Ice	J	1			X		
MW03_14.0	23-Sep-23		Soil	Ice	J	1			X		
FD01	22-Sep-23		Soil	Ice	J	1			X		
FS01	22-Sep-23		Soil	Ice	J	1			X		
FD02	22-Sep-23		Soil	Ice	J	1			X		
FS02	22-Sep-23		Soil	Ice	J	1			X		
FD03	22-Sep-23		Soil	Ice	J	1		X			
FS03	22-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD04	23-Sep-23		Soil	Ice	J	1		X			
FS04	23-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD05	23-Sep-23		Soil	Ice	J	1			X		
FS05	23-Sep-23		Soil	Ice	J	1			X		
FD06	23-Sep-23		Soil	Ice	J	1		X			
FS06	23-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD07	24-Sep-23		Soil	Ice	J	1			X		
FS07	24-Sep-23		Soil	Ice	J	1			X		
FD08	24-Sep-23		Soil	Ice	P	1		X			
FS08	24-Sep-23		Soil	Ice	P	1				X	Please forward to ALS for analysis
FB01	22-Sep-23		Water	Ice	P	1		X			
RB01	22-Sep-23		Water	Ice	P	1		X			
RB02	23-Sep-23		Water	Ice	P	1		X			
RB03	24-Sep-23		Water	Ice	P	1		X			
TOTAL NUMBER OF SAMPLES	113										
TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS			
SAMPLER			
	Date/Time	Relinquished by:	Date/Time
GHD SERVICE CENTRE			
Received by:	Date/Time	Relinquished by:	Date/Time
COURIER			

12 EG

COPY

GHD

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address
Level 4 - 211 Victoria Square, Adelaide SA 5000
Telephone: (08) 8111 6800

Completion Date / Turnaround: STANDARD

Quote #: Quote GHD STANDARD RATES

Project Number	12618806
Project Name	MPB Peterborough DSI
GHD Project Manager	Tom Duncan
GHD Contact	Ally Kinman
GHD PM email	Tom.Duncan@ghd.com
GHD Contact email	Ally.Kinman@ghd.com
Laboratory	Eurofins Environmental
Laboratory Address	6 Main Terrace, Richmond SA 5033
Laboratory Contact	Parimal Acharya

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on receipt and release of samples, between each party.
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf formats and EDDAT format.

Sample I.D.	Date and Time	Container/Sample	Sample Matrix (i.e. Soil, Air, Water, Trip Blank, Rinsate, Field QC, Leachate, Other)	Preservative	Containers: Type (i.e. EnCore, Vial, Bag, Plastic, Amber Glass, Glass Jar, Speciation Bottle)	Containers: Number	Volume (ml)	Analysis Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ALS	SAMPLE COMMENTS
MW03_2.0	23-Sep-23		Soil	Ice	J	1			X		
MW03_2.5	23-Sep-23		Soil	Ice	J	1			X		
MW03_3.0	23-Sep-23		Soil	Ice	J	1		X			
MW03_3.5	23-Sep-23		Soil	Ice	J	1			X		
MW03_14.0	23-Sep-23		Soil	Ice	J	1			X		
FD01	22-Sep-23		Soil	Ice	J	1			X		
FS01	22-Sep-23		Soil	Ice	J	1			X		
FD02	22-Sep-23		Soil	Ice	J	1			X		
FS02	22-Sep-23		Soil	Ice	J	1			X		
FD03	22-Sep-23		Soil	Ice	J	1		X			
FS03	22-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD04	23-Sep-23		Soil	Ice	J	1		X			
FS04	23-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD05	23-Sep-23		Soil	Ice	J	1			X		
FS05	23-Sep-23		Soil	Ice	J	1			X		
FD06	23-Sep-23		Soil	Ice	J	1		X			
FS06	23-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD07	24-Sep-23		Soil	Ice	J	1			X		
FS07	24-Sep-23		Soil	Ice	J	1			X		
FD08	24-Sep-23		Soil	Ice	P	1		X			
FS08	24-Sep-23		Soil	Ice	P	1				X	Please forward to ALS for analysis
FB01	22-Sep-23		Water	Ice	P	1		X			
RB01	22-Sep-23		Water	Ice	P	1		X			
RB02	23-Sep-23		Water	Ice	P	1		X			
RB03	24-Sep-23		Water	Ice	P	1		X			
TOTAL NUMBER OF SAMPLES	113										
TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS:

SAMPLER				
GHD SERVICE CENTRE	Date/Time	Relinquished by:		Date/Time
Received by:	Date/Time	Relinquished by:		Date/Time
COURIER				

$1022.44

27/9/23

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address	Completion Date / Turnaround	Quote #
Level 4 - 211 Victoria Square, Adelaide SA 5000 Telephone: (08) 8111 6600	STANDARD	Quote GHD STANDARD RATES

Project Number 12618606	**Laboratory** Eurofins Environmental
Project Name MFE Peterborough DSI	**Laboratory Address** 9 Main Terrace, Richmond SA 5033
GHD Project Manager Tom Duncan	**Laboratory Contact** Parimal Acharya
GHD Contact Alls Kirkegan	
GHD PM email Tom.Duncan@ghd.com	**GHD Contact email** Alls.Kirkegan@ghd.com

Sample I.D.	Date and Time	Composite Sample	Sample Matrix: W: water S: Soil A: Air O: Other (specify)	Preservative	Containers: Type J: Soil jar B: bag V: vial G: glass bottle P: plastic bottle	Containers: Number	Containers: Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ALS

COURIER AND LABORATORY INSTRUCTIONS:

- Sign chain of custody document on receipt and release of samples, between each party.
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and ESDAT format

SAMPLE COMMENTS

Received by Courier:	Date/Time	Relinquished by:	Date/Time
LABORATORY			
Received by Lab:	Date/Time		

Tyrone Gowans

From: Amy Meunier
Sent: Wednesday, 27 September 2023 3:25 PM
To: #AU_CAU001_EnviroSampleVic
Subject: FW: Samples Received
Attachments: 12616806_CoC_Peterborough_DSI.pdf; 12616807_CoC_Port_Pirie_DSI.pdf

Follow Up Flag: Follow up
Flag Status: Completed

INFO: INTERNAL EMAIL - Sent from your own Eurofins email domain.

Hi Tyrone – COCs attached thanks

Kind regards,

Amy Meunier

Analytical Services Manager
Mobile : +61 477 574 867
Email : AmyMeunier@eurofins.com

Eurofins
6 Monterey Road,
Dandenong VIC 3175
Australia

My office hours are 9am to 5:30pm (Monday to Friday)
If you require sample receipt outside these hours please email envirosamplevic@eurofins.com



From: Ally Kirkman <Ally.Kirkman@ghd.com>
Sent: Wednesday, 27 September 2023 3:19 PM
To: Amy Meunier <AmyMeunier@eurofins.com>
Cc: Parimal Acharya <ParimalAcharya@eurofins.com>; Tom Duncan <Thomas.Duncan@ghd.com>
Subject: RE: Samples Received

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins. Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Amy,

Apologies for the delay. Attached are the COCs for each job.

Reach out if you have any questions.

Cheers,
Ally

From: Amy Meunier <AmyMeunier@eurofins.com>
Sent: Wednesday, September 27, 2023 9:16 AM

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PROJECT INFORMATION

Date Received:

Company: QHD

Contact person: Ally Kirkman

Contact Number:

Contact E-mail: #1029914

Project Name/site: 12616808

Project Number:

COC: Attached ☐
E-mailed ☐
Not received ☐

9.9°C
−0.3°C
9.6°C
on ice.

Last modified on: 16 October 2019	Approved on: 16 October 2019	Version: QS1039_R2
Last modified by: H. Le	Approver: M. Makarios	Page 1 of 1
Editorial Committee: T. Lakeland, F. Sanjaya, H. Le, M. Makarios		Next required review date: 16 October 2022

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www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd

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Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Ally Kirkman
Project name:	MFS PETERBOROUGH DSI
Project ID:	12616806
Turnaround time:	5 Day
Date/Time received	Sep 27, 2023 3:25 PM
Eurofins reference	1029914

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✓	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

SAMPLES BH01_3.5. BH01_4.0 AND BH01_4.5 NOT RECEIVED. SAMPLE BH05_4.2 RECEIVED AS BH05_4.0

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Amy Meunier on phone : or by email: AmyMeunier@eurofins.com

Results will be delivered electronically via email to Ally Kirkman - ally.kirkman@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd SA email address.

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web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

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Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
Adelaide
SA 5001

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	BH01_0.5	Sep 24, 2023		Soil	M23-Se0065095			X	X
2	BH01_2.0	Sep 24, 2023		Soil	M23-Se0065096			X	X
3	BH03_0.1	Sep 24, 2023		Soil	M23-Se0065097			X	X
4	BH03_1.5	Sep 24, 2023		Soil	M23-Se0065098			X	X
5	BH04_0.5	Sep 24, 2023		Soil	M23-Se0065099			X	X
6	BH04_2.5	Sep 24, 2023		Soil	M23-Se0065100			X	X
7	BH05_0.5	Sep 22, 2023		Soil	M23-Se0065101			X	X
8	BH05_2.5	Sep 22, 2023		Soil	M23-Se0065102			X	X
9	BH06_0.5	Sep 22, 2023		Soil	M23-Se0065103			X	X
10	BH06_3.5	Sep 22, 2023		Soil	M23-Se0065104			X	X
11	SS01	Sep 23, 2023		Soil	M23-Se0065105			X	X
12	SS02	Sep 23, 2023		Soil	M23-Se0065106			X	X
13	SS03	Sep 23, 2023		Soil	M23-Se0065107			X	X

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web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
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Welshpool
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Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
Adelaide
SA 5001

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
14	SS04	Sep 23, 2023		Soil	M23-Se0065108			X	X
15	MW01_0.5	Sep 23, 2023		Soil	M23-Se0065109			X	X
16	MW01_4.5	Sep 23, 2023		Soil	M23-Se0065110			X	X
17	MW02_0.5	Sep 22, 2023		Soil	M23-Se0065111			X	X
18	MW02_5.5	Sep 21, 2023		Soil	M23-Se0065112			X	X
19	MW03_0.5	Sep 23, 2023		Soil	M23-Se0065113			X	X
20	MW03_3.0	Sep 23, 2023		Soil	M23-Se0065114			X	X
21	FD03	Sep 22, 2023		Soil	M23-Se0065115			X	X
22	FD04	Sep 23, 2023		Soil	M23-Se0065116			X	X
23	FD06	Sep 23, 2023		Soil	M23-Se0065117			X	X
24	FD08	Sep 24, 2023		Soil	M23-Se0065118			X	X
25	FB01	Sep 22, 2023		Water	M23-Se0065119				X
26	RB01	Sep 22, 2023		Water	M23-Se0065120				X
27	RB02	Sep 23, 2023		Water	M23-Se0065121				X
28	RB03	Sep 24, 2023		Water	M23-Se0065122				X
29	BH01_PAVER	Sep 24, 2023		Soil	M23-Se0065123		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
Adelaide
SA 5001

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
30	BH01_0.1	Sep 24, 2023		Soil	M23-Se0065124		X		
31	BH01_1.0	Sep 24, 2023		Soil	M23-Se0065125		X		
32	BH01_1.5	Sep 24, 2023		Soil	M23-Se0065126		X		
33	BH01_2.5	Sep 24, 2023		Soil	M23-Se0065127		X		
34	BH01_3.0	Sep 24, 2023		Soil	M23-Se0065128		X		
35	BH01_3.5	Sep 24, 2023		Soil	M23-Se0065129	X			
36	BH01_4.0	Sep 24, 2023		Soil	M23-Se0065130	X			
37	BH01_4.5	Sep 24, 2023		Soil	M23-Se0065131	X			
38	BH03_0.5	Sep 24, 2023		Soil	M23-Se0065132		X		
39	BH03_1.0	Sep 24, 2023		Soil	M23-Se0065133		X		
40	BH03_2.0	Sep 24, 2023		Soil	M23-Se0065134		X		
41	BH03_2.5	Sep 24, 2023		Soil	M23-Se0065135		X		
42	BH03_3.0	Sep 24, 2023		Soil	M23-Se0065136		X		
43	BH03_3.5	Sep 24, 2023		Soil	M23-Se0065137		X		
44	BH03_4.0	Sep 24, 2023		Soil	M23-Se0065138		X		
45	BH03_4.5	Sep 24, 2023		Soil	M23-Se0065139		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Project ID: 12616806

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Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
46	BH04_0.1	Sep 24, 2023		Soil	M23-Se0065140		X		
47	BH04_1.0	Sep 24, 2023		Soil	M23-Se0065141		X		
48	BH04_1.5	Sep 24, 2023		Soil	M23-Se0065142		X		
49	BH04_2.0	Sep 24, 2023		Soil	M23-Se0065143		X		
50	BH04_3.0	Sep 24, 2023		Soil	M23-Se0065144		X		
51	BH04_3.5	Sep 24, 2023		Soil	M23-Se0065145		X		
52	BH04_4.3	Sep 24, 2023		Soil	M23-Se0065146		X		
53	BH05_0.1	Sep 22, 2023		Soil	M23-Se0065147		X		
54	BH05_1.0	Sep 22, 2023		Soil	M23-Se0065148		X		
55	BH05_1.5	Sep 22, 2023		Soil	M23-Se0065149		X		
56	BH05_2.0	Sep 22, 2023		Soil	M23-Se0065150		X		
57	BH05_3.0	Sep 22, 2023		Soil	M23-Se0065151		X		
58	BH05_3.5	Sep 22, 2023		Soil	M23-Se0065152		X		
59	BH05_4.0	Sep 22, 2023		Soil	M23-Se0065153		X		
60	BH06_0.1	Sep 22, 2023		Soil	M23-Se0065154		X		
61	BH06_1.0	Sep 22, 2023		Soil	M23-Se0065155		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
62	BH06_1.5	Sep 22, 2023		Soil	M23-Se0065156		X		
63	BH06_2.0	Sep 22, 2023		Soil	M23-Se0065157		X		
64	BH06_2.5	Sep 22, 2023		Soil	M23-Se0065158		X		
65	BH06_3.0	Sep 22, 2023		Soil	M23-Se0065159		X		
66	BH06_4.2	Sep 22, 2023		Soil	M23-Se0065160		X		
67	MW01_0.1	Sep 23, 2023		Soil	M23-Se0065161		X		
68	MW01_1.0	Sep 23, 2023		Soil	M23-Se0065162		X		
69	MW01_1.5	Sep 23, 2023		Soil	M23-Se0065163		X		
70	MW01_2.0	Sep 23, 2023		Soil	M23-Se0065164		X		
71	MW01_2.5	Sep 23, 2023		Soil	M23-Se0065165		X		
72	MW01_3.0	Sep 23, 2023		Soil	M23-Se0065166		X		
73	MW01_3.5	Sep 23, 2023		Soil	M23-Se0065167		X		
74	MW01_4.0	Sep 23, 2023		Soil	M23-Se0065168		X		
75	MW01_15	Sep 23, 2023		Soil	M23-Se0065169		X		
76	MW02_0.1	Sep 22, 2023		Soil	M23-Se0065170		X		
77	MW02_1.0	Sep 21, 2023		Soil	M23-Se0065171		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Received: Sep 27, 2023 3:25 PM
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Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
78	MW02_1.5	Sep 21, 2023		Soil	M23-Se0065172		X		
79	MW02_2.0	Sep 21, 2023		Soil	M23-Se0065173		X		
80	MW02_2.5	Sep 21, 2023		Soil	M23-Se0065174		X		
81	MW02_3.0	Sep 21, 2023		Soil	M23-Se0065175		X		
82	MW02_3.5	Sep 21, 2023		Soil	M23-Se0065176		X		
83	MW02_4.0	Sep 21, 2023		Soil	M23-Se0065177		X		
84	MW02_4.5	Sep 21, 2023		Soil	M23-Se0065178		X		
85	MW02_5.0	Sep 21, 2023		Soil	M23-Se0065179		X		
86	MW02_6.0	Sep 21, 2023		Soil	M23-Se0065180		X		
87	MW02_6.5	Sep 21, 2023		Soil	M23-Se0065181		X		
88	MW02_7.0	Sep 21, 2023		Soil	M23-Se0065182		X		
89	MW02_7.5	Sep 21, 2023		Soil	M23-Se0065183		X		
90	MW02_8.0	Sep 21, 2023		Soil	M23-Se0065184		X		
91	MW02_8.5	Sep 21, 2023		Soil	M23-Se0065185		X		
92	MW02_9.0	Sep 21, 2023		Soil	M23-Se0065186		X		
93	MW02_9.5	Sep 21, 2023		Soil	M23-Se0065187		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Received: Sep 27, 2023 3:25 PM
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Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
94	MW02_10.0	Sep 21, 2023		Soil	M23-Se0065188		X		
95	MW02_12.0	Sep 21, 2023		Soil	M23-Se0065189		X		
96	MW02_15.0	Sep 21, 2023		Soil	M23-Se0065190		X		
97	MW03_0.1	Sep 23, 2023		Soil	M23-Se0065191		X		
98	MW03_1.0	Sep 23, 2023		Soil	M23-Se0065192		X		
99	MW03_1.5	Sep 23, 2023		Soil	M23-Se0065193		X		
100	MW03_2.0	Sep 23, 2023		Soil	M23-Se0065194		X		
101	MW03_2.5	Sep 23, 2023		Soil	M23-Se0065195		X		
102	MW03_3.5	Sep 23, 2023		Soil	M23-Se0065196		X		
103	MW03_14.0	Sep 23, 2023		Soil	M23-Se0065197		X		
104	FD01	Sep 22, 2023		Soil	M23-Se0065198		X		
105	FS01	Sep 22, 2023		Soil	M23-Se0065199		X		
106	FD02	Sep 22, 2023		Soil	M23-Se0065200		X		
107	FS02	Sep 22, 2023		Soil	M23-Se0065201		X		
108	FD05	Sep 23, 2023		Soil	M23-Se0065202		X		
109	FS05	Sep 23, 2023		Soil	M23-Se0065203		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
110	FD07	Sep 24, 2023		Soil	M23-Se0065204		X		
111	FS07	Sep 24, 2023		Soil	M23-Se0065205		X		
Test Counts						3	80	24	28

GHD Pty Ltd
GPO Box 2052
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SA 5001

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Ally Kirkman**

Report **1029914-S**
Project name MFS PETERBOROUGH DSI
Project ID 12616806
Received Date Sep 27, 2023

Client Sample ID			**BH01_0.5**	**BH01_2.0**	**BH03_0.1**	**BH03_1.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M23-Se0065095**	**M23-Se0065096**	**M23-Se0065097**	**M23-Se0065098**
Date Sampled			**Sep 24, 2023**	**Sep 24, 2023**	**Sep 24, 2023**	**Sep 24, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	11	13	5.1	6.0
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	19
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	88	87	79	74
13C5-PFPeA (surr.)	1	%	99	98	98	91
13C5-PFHxA (surr.)	1	%	112	97	87	101
13C4-PFHpA (surr.)	1	%	106	89	100	98
13C8-PFOA (surr.)	1	%	99	98	104	105
13C5-PFNA (surr.)	1	%	97	92	99	99
13C6-PFDA (surr.)	1	%	107	106	106	108
13C2-PFUnDA (surr.)	1	%	112	112	115	115
13C2-PFDoDA (surr.)	1	%	120	110	111	114
13C2-PFTeDA (surr.)	1	%	93	84	88	90
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			BH01_0.5	BH01_2.0	BH03_0.1	BH03_1.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065095	M23-Se0065096	M23-Se0065097	M23-Se0065098
Date Sampled			Sep 24, 2023	Sep 24, 2023	Sep 24, 2023	Sep 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	112	111	104	103
D3-N-MeFOSA (surr.)	1	%	129	127	117	117
D5-N-EtFOSA (surr.)	1	%	132	132	122	117
D7-N-MeFOSE (surr.)	1	%	102	108	94	99
D9-N-EtFOSE (surr.)	1	%	99	100	93	100
D5-N-EtFOSAA (surr.)	1	%	120	135	102	99
D3-N-MeFOSAA (surr.)	1	%	104	116	100	95
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	[N09]9.0
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	[N09]7.4	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	[N09]7.0
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]6.9	5.1	< 5	[N09]71
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]230	[N09]120	[N09]150	[N09]85
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	[N09]6.7	< 5
13C3-PFBS (surr.)	1	%	100	94	96	92
18O2-PFHxS (surr.)	1	%	102	93	97	89
13C8-PFOS (surr.)	1	%	97	91	85	88
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	114	94	93	84
13C2-6:2 FTSA (surr.)	1	%	122	123	108	101
13C2-8:2 FTSA (surr.)	1	%	95	101	91	87
13C2-10:2 FTSA (surr.)	1	%	105	103	92	97
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	236.9	125.1	150	156
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	230	120	150	85
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	236.9	125.1	150	156
Sum of WA DWER PFAS (n=10)*	10	ug/kg	236.9	125.1	150	184
Sum of PFASs (n=30)*	50	ug/kg	236.9	125.1	164.1	191

Client Sample ID			BH04_0.5	BH04_2.5	BH05_0.5	BH05_2.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065099	M23-Se0065100	M23-Se0065101	M23-Se0065102
Date Sampled			Sep 24, 2023	Sep 24, 2023	Sep 22, 2023	Sep 22, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	12	6.2	9.0	10
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	5.6	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	5.7	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	81	82	91	96
13C5-PFPeA (surr.)	1	%	94	99	108	107
13C5-PFHxA (surr.)	1	%	89	98	116	134
13C4-PFHpA (surr.)	1	%	94	108	91	98
13C8-PFOA (surr.)	1	%	96	102	88	92
13C5-PFNA (surr.)	1	%	90	108	93	102
13C6-PFDA (surr.)	1	%	97	106	99	106
13C2-PFUnDA (surr.)	1	%	107	114	109	106
13C2-PFDoDA (surr.)	1	%	111	118	125	127
13C2-PFTeDA (surr.)	1	%	81	90	84	92
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	99	110	105	114
D3-N-MeFOSA (surr.)	1	%	110	124	110	118
D5-N-EtFOSA (surr.)	1	%	112	127	98	101
D7-N-MeFOSE (surr.)	1	%	89	99	89	96
D9-N-EtFOSE (surr.)	1	%	89	96	98	96
D5-N-EtFOSAA (surr.)	1	%	106	120	99	105
D3-N-MeFOSAA (surr.)	1	%	104	110	104	119
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	[N09]12	< 5	[N09]34	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]13	[N09]55	[N09]19	[N09]7.1
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			BH04_0.5	BH04_2.5	BH05_0.5	BH05_2.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065099	M23-Se0065100	M23-Se0065101	M23-Se0065102
Date Sampled			Sep 24, 2023	Sep 24, 2023	Sep 22, 2023	Sep 22, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]400	[N09]280	[N09]810	[N09]580
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	89	90	108	109
18O2-PFHxS (surr.)	1	%	86	94	102	103
13C8-PFOS (surr.)	1	%	102	121	137	108
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	62	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	91	99	87	87
13C2-6:2 FTSA (surr.)	1	%	107	106	89	95
13C2-8:2 FTSA (surr.)	1	%	86	97	100	99
13C2-10:2 FTSA (surr.)	1	%	92	106	122	137
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	413	335	829	587.1
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	400	280	810	580
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	413	335	829	587.1
Sum of WA DWER PFAS (n=10)*	10	ug/kg	486.3	335	829	587.1
Sum of PFASs (n=30)*	50	ug/kg	498.3	335	863	587.1

Client Sample ID			BH06_0.5	BH06_3.5	SS01	SS02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065103	M23-Se0065104	M23-Se0065105	M23-Se0065106
Date Sampled			Sep 22, 2023	Sep 22, 2023	Sep 23, 2023	Sep 23, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	12	15	6.7	4.0
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	5.1	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	93	89	82	81
13C5-PFPeA (surr.)	1	%	101	98	93	91
13C5-PFHxA (surr.)	1	%	117	113	106	102
13C4-PFHpA (surr.)	1	%	94	92	87	87

Client Sample ID			BH06_0.5	BH06_3.5	SS01	SS02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065103	M23-Se0065104	M23-Se0065105	M23-Se0065106
Date Sampled			Sep 22, 2023	Sep 22, 2023	Sep 23, 2023	Sep 23, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C8-PFOA (surr.)	1	%	90	87	83	82
13C5-PFNA (surr.)	1	%	94	91	90	86
13C6-PFDA (surr.)	1	%	102	106	93	94
13C2-PFUnDA (surr.)	1	%	112	109	99	100
13C2-PFDoDA (surr.)	1	%	126	119	115	115
13C2-PFTeDA (surr.)	1	%	80	84	85	91
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	117	113	94	100
D3-N-MeFOSA (surr.)	1	%	116	117	110	107
D5-N-EtFOSA (surr.)	1	%	105	97	95	96
D7-N-MeFOSE (surr.)	1	%	92	93	82	82
D9-N-EtFOSE (surr.)	1	%	97	96	84	84
D5-N-EtFOSAA (surr.)	1	%	104	102	96	98
D3-N-MeFOSAA (surr.)	1	%	108	104	89	93
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	[N09]9.6	< 5	< 5	[N09]16
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	[N09]42	< 5	[N09]22
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]510	< 5	[N09]100	[N09]330
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	[N09]17
13C3-PFBS (surr.)	1	%	109	102	97	96
18O2-PFHxS (surr.)	1	%	101	99	91	91
13C8-PFOS (surr.)	1	%	98	106	94	95
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	90	90	92	118
13C2-6:2 FTSA (surr.)	1	%	93	86	110	106
13C2-8:2 FTSA (surr.)	1	%	98	100	91	93
13C2-10:2 FTSA (surr.)	1	%	131	115	107	109

Client Sample ID			BH06_0.5	BH06_3.5	SS01	SS02
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065103	M23-Se0065104	M23-Se0065105	M23-Se0065106
Date Sampled			Sep 22, 2023	Sep 22, 2023	Sep 23, 2023	Sep 23, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	510	42	100	352
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	510	< 5	100	330
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	510	42	100	352
Sum of WA DWER PFAS (n=10)*	10	ug/kg	510	47.1	100	352
Sum of PFASs (n=30)*	50	ug/kg	519.6	< 50	100	385

Client Sample ID			SS03	SS04	MW01_0.5	MW01_4.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065107	M23-Se0065108	M23-Se0065109	M23-Se0065110
Date Sampled			Sep 23, 2023	Sep 23, 2023	Sep 23, 2023	Sep 23, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	5.9	4.3	9.2	7.5
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	80	78	73	75
13C5-PFPeA (surr.)	1	%	87	84	77	77
13C5-PFHxA (surr.)	1	%	110	91	90	85
13C4-PFHpA (surr.)	1	%	87	77	76	68
13C8-PFOA (surr.)	1	%	78	68	65	65
13C5-PFNA (surr.)	1	%	84	76	73	63
13C6-PFDA (surr.)	1	%	97	79	71	71
13C2-PFUnDA (surr.)	1	%	96	78	75	73
13C2-PFDoDA (surr.)	1	%	110	89	81	70
13C2-PFTeDA (surr.)	1	%	85	67	66	54
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	6.1	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10

Client Sample ID			SS03	SS04	MW01_0.5	MW01_4.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065107	M23-Se0065108	M23-Se0065109	M23-Se0065110
Date Sampled			Sep 23, 2023	Sep 23, 2023	Sep 23, 2023	Sep 23, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	99	79	76	76
D3-N-MeFOSA (surr.)	1	%	111	81	76	65
D5-N-EtFOSA (surr.)	1	%	95	67	63	55
D7-N-MeFOSE (surr.)	1	%	81	62	56	54
D9-N-EtFOSE (surr.)	1	%	79	62	57	53
D5-N-EtFOSAA (surr.)	1	%	97	80	73	70
D3-N-MeFOSAA (surr.)	1	%	96	76	76	69
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	[N09]7.5	< 5	[N09]20	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]7.0	< 5	[N09]21	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]180	[N09]59	[N09]810	[N09]65
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	[N09]10	< 5	[N09]7.7	< 5
13C3-PFBS (surr.)	1	%	98	85	81	75
18O2-PFHxS (surr.)	1	%	94	85	72	68
13C8-PFOS (surr.)	1	%	91	79	109	80
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	101	85	71	75
13C2-6:2 FTSA (surr.)	1	%	103	79	66	66
13C2-8:2 FTSA (surr.)	1	%	95	85	72	67
13C2-10:2 FTSA (surr.)	1	%	109	81	80	76
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	187	59	831	65
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	180	59	810	65
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	187	59	831	65
Sum of WA DWER PFAS (n=10)*	10	ug/kg	187	59	831	65
Sum of PFASs (n=30)*	50	ug/kg	204.5	59	864.8	65

Client Sample ID			MW02_0.5	MW02_5.5	MW03_0.5	MW03_3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065111	M23-Se0065112	M23-Se0065113	M23-Se0065114
Date Sampled			Sep 22, 2023	Sep 21, 2023	Sep 23, 2023	Sep 23, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	15	8.9	8.2	6.7
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	7.1
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	135	107	106	102
13C5-PFPeA (surr.)	1	%	133	122	121	116
13C5-PFHxA (surr.)	1	%	127	101	101	96
13C4-PFHpA (surr.)	1	%	120	98	99	94
13C8-PFOA (surr.)	1	%	130	93	92	89
13C5-PFNA (surr.)	1	%	101	96	96	95
13C6-PFDA (surr.)	1	%	114	91	95	90
13C2-PFUnDA (surr.)	1	%	116	120	123	116
13C2-PFDoDA (surr.)	1	%	124	109	113	105
13C2-PFTeDA (surr.)	1	%	107	95	98	92
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	101	100	112	104
D3-N-MeFOSA (surr.)	1	%	113	99	100	89
D5-N-EtFOSA (surr.)	1	%	124	108	117	103
D7-N-MeFOSE (surr.)	1	%	92	129	130	116
D9-N-EtFOSE (surr.)	1	%	90	111	118	114
D5-N-EtFOSAA (surr.)	1	%	144	137	121	113
D3-N-MeFOSAA (surr.)	1	%	142	128	125	111
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	[N09]5.6
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	[N09]6.0
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]22	[N09]10.0	< 5	[N09]38
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			MW02_0.5	MW02_5.5	MW03_0.5	MW03_3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065111	M23-Se0065112	M23-Se0065113	M23-Se0065114
Date Sampled			Sep 22, 2023	Sep 21, 2023	Sep 23, 2023	Sep 23, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]1100	< 5	[N09]390	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	127	93	95	86
18O2-PFHxS (surr.)	1	%	135	97	85	79
13C8-PFOS (surr.)	1	%	102	83	77	85
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	114	76	74	75
13C2-6:2 FTSA (surr.)	1	%	120	93	100	91
13C2-8:2 FTSA (surr.)	1	%	117	132	129	128
13C2-10:2 FTSA (surr.)	1	%	159	137	143	113
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	1122	10	390	38
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	1100	< 5	390	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	1122	10	390	38
Sum of WA DWER PFAS (n=10)*	10	ug/kg	1122	10	390	50.7
Sum of PFASs (n=30)*	50	ug/kg	1122	< 50	390	56.7

Client Sample ID			FD03	FD04	FD06	FD08
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065115	M23-Se0065116	M23-Se0065117	M23-Se0065118
Date Sampled			Sep 22, 2023	Sep 23, 2023	Sep 23, 2023	Sep 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	11	9.3	20	8.3
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	106	113	106	104
13C5-PFPeA (surr.)	1	%	124	125	122	118
13C5-PFHxA (surr.)	1	%	104	105	100	98
13C4-PFHpA (surr.)	1	%	100	105	101	96

Client Sample ID			FD03	FD04	FD06	FD08
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065115	M23-Se0065116	M23-Se0065117	M23-Se0065118
Date Sampled			Sep 22, 2023	Sep 23, 2023	Sep 23, 2023	Sep 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C8-PFOA (surr.)	1	%	93	98	94	89
13C5-PFNA (surr.)	1	%	95	101	94	93
13C6-PFDA (surr.)	1	%	91	91	90	91
13C2-PFUnDA (surr.)	1	%	120	126	115	117
13C2-PFDoDA (surr.)	1	%	111	116	111	108
13C2-PFTeDA (surr.)	1	%	98	111	92	96
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	105	105	103	103
D3-N-MeFOSA (surr.)	1	%	103	103	93	92
D5-N-EtFOSA (surr.)	1	%	115	115	113	106
D7-N-MeFOSE (surr.)	1	%	121	141	133	127
D9-N-EtFOSE (surr.)	1	%	107	116	113	109
D5-N-EtFOSAA (surr.)	1	%	115	125	112	124
D3-N-MeFOSAA (surr.)	1	%	118	132	121	126
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	5.6	[N09]18	< 5	[N09]12
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]580	< 5	[N09]43	[N09]230
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	97	98	98	90
18O2-PFHxS (surr.)	1	%	89	88	94	85
13C8-PFOS (surr.)	1	%	72	89	79	81
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	76	81	83	78
13C2-6:2 FTSA (surr.)	1	%	86	99	99	102
13C2-8:2 FTSA (surr.)	1	%	141	136	132	123
13C2-10:2 FTSA (surr.)	1	%	127	129	127	133

Client Sample ID			FD03	FD04	FD06	FD08
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0065115	M23-Se0065116	M23-Se0065117	M23-Se0065118
Date Sampled			Sep 22, 2023	Sep 23, 2023	Sep 23, 2023	Sep 24, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	585.6	18	43	242
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	580	< 5	43	230
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	585.6	18	43	242
Sum of WA DWER PFAS (n=10)*	10	ug/kg	585.6	18	43	242
Sum of PFASs (n=30)*	50	ug/kg	585.6	< 50	< 50	242

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Sep 27, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Oct 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Oct 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Oct 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Oct 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Sep 27, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
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SA 5001

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	BH01_0.5	Sep 24, 2023		Soil	M23-Se0065095			X	X
2	BH01_2.0	Sep 24, 2023		Soil	M23-Se0065096			X	X
3	BH03_0.1	Sep 24, 2023		Soil	M23-Se0065097			X	X
4	BH03_1.5	Sep 24, 2023		Soil	M23-Se0065098			X	X
5	BH04_0.5	Sep 24, 2023		Soil	M23-Se0065099			X	X
6	BH04_2.5	Sep 24, 2023		Soil	M23-Se0065100			X	X
7	BH05_0.5	Sep 22, 2023		Soil	M23-Se0065101			X	X
8	BH05_2.5	Sep 22, 2023		Soil	M23-Se0065102			X	X
9	BH06_0.5	Sep 22, 2023		Soil	M23-Se0065103			X	X
10	BH06_3.5	Sep 22, 2023		Soil	M23-Se0065104			X	X
11	SS01	Sep 23, 2023		Soil	M23-Se0065105			X	X
12	SS02	Sep 23, 2023		Soil	M23-Se0065106			X	X
13	SS03	Sep 23, 2023		Soil	M23-Se0065107			X	X

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Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
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VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
14	SS04	Sep 23, 2023		Soil	M23-Se0065108			X	X
15	MW01_0.5	Sep 23, 2023		Soil	M23-Se0065109			X	X
16	MW01_4.5	Sep 23, 2023		Soil	M23-Se0065110			X	X
17	MW02_0.5	Sep 22, 2023		Soil	M23-Se0065111			X	X
18	MW02_5.5	Sep 21, 2023		Soil	M23-Se0065112			X	X
19	MW03_0.5	Sep 23, 2023		Soil	M23-Se0065113			X	X
20	MW03_3.0	Sep 23, 2023		Soil	M23-Se0065114			X	X
21	FD03	Sep 22, 2023		Soil	M23-Se0065115			X	X
22	FD04	Sep 23, 2023		Soil	M23-Se0065116			X	X
23	FD06	Sep 23, 2023		Soil	M23-Se0065117			X	X
24	FD08	Sep 24, 2023		Soil	M23-Se0065118			X	X
25	FB01	Sep 22, 2023		Water	M23-Se0065119				X
26	RB01	Sep 22, 2023		Water	M23-Se0065120				X
27	RB02	Sep 23, 2023		Water	M23-Se0065121				X
28	RB03	Sep 24, 2023		Water	M23-Se0065122				X
29	BH01_PAVER	Sep 24, 2023		Soil	M23-Se0065123		X		

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Eurofins Environment Testing Australia Pty Ltd
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Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
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VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Report #: 1029914
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 27, 2023 3:25 PM
Due: Oct 5, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
30	BH01_0.1	Sep 24, 2023		Soil	M23-Se0065124		X		
31	BH01_1.0	Sep 24, 2023		Soil	M23-Se0065125		X		
32	BH01_1.5	Sep 24, 2023		Soil	M23-Se0065126		X		
33	BH01_2.5	Sep 24, 2023		Soil	M23-Se0065127		X		
34	BH01_3.0	Sep 24, 2023		Soil	M23-Se0065128		X		
35	BH01_3.5	Sep 24, 2023		Soil	M23-Se0065129	X			
36	BH01_4.0	Sep 24, 2023		Soil	M23-Se0065130	X			
37	BH01_4.5	Sep 24, 2023		Soil	M23-Se0065131	X			
38	BH03_0.5	Sep 24, 2023		Soil	M23-Se0065132		X		
39	BH03_1.0	Sep 24, 2023		Soil	M23-Se0065133		X		
40	BH03_2.0	Sep 24, 2023		Soil	M23-Se0065134		X		
41	BH03_2.5	Sep 24, 2023		Soil	M23-Se0065135		X		
42	BH03_3.0	Sep 24, 2023		Soil	M23-Se0065136		X		
43	BH03_3.5	Sep 24, 2023		Soil	M23-Se0065137		X		
44	BH03_4.0	Sep 24, 2023		Soil	M23-Se0065138		X		
45	BH03_4.5	Sep 24, 2023		Soil	M23-Se0065139		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Company Name: GHD Pty Ltd SA
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SA 5001

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

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Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
46	BH04_0.1	Sep 24, 2023		Soil	M23-Se0065140		X		
47	BH04_1.0	Sep 24, 2023		Soil	M23-Se0065141		X		
48	BH04_1.5	Sep 24, 2023		Soil	M23-Se0065142		X		
49	BH04_2.0	Sep 24, 2023		Soil	M23-Se0065143		X		
50	BH04_3.0	Sep 24, 2023		Soil	M23-Se0065144		X		
51	BH04_3.5	Sep 24, 2023		Soil	M23-Se0065145		X		
52	BH04_4.3	Sep 24, 2023		Soil	M23-Se0065146		X		
53	BH05_0.1	Sep 22, 2023		Soil	M23-Se0065147		X		
54	BH05_1.0	Sep 22, 2023		Soil	M23-Se0065148		X		
55	BH05_1.5	Sep 22, 2023		Soil	M23-Se0065149		X		
56	BH05_2.0	Sep 22, 2023		Soil	M23-Se0065150		X		
57	BH05_3.0	Sep 22, 2023		Soil	M23-Se0065151		X		
58	BH05_3.5	Sep 22, 2023		Soil	M23-Se0065152		X		
59	BH05_4.0	Sep 22, 2023		Soil	M23-Se0065153		X		
60	BH06_0.1	Sep 22, 2023		Soil	M23-Se0065154		X		
61	BH06_1.0	Sep 22, 2023		Soil	M23-Se0065155		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
62	BH06_1.5	Sep 22, 2023		Soil	M23-Se0065156		X		
63	BH06_2.0	Sep 22, 2023		Soil	M23-Se0065157		X		
64	BH06_2.5	Sep 22, 2023		Soil	M23-Se0065158		X		
65	BH06_3.0	Sep 22, 2023		Soil	M23-Se0065159		X		
66	BH06_4.2	Sep 22, 2023		Soil	M23-Se0065160		X		
67	MW01_0.1	Sep 23, 2023		Soil	M23-Se0065161		X		
68	MW01_1.0	Sep 23, 2023		Soil	M23-Se0065162		X		
69	MW01_1.5	Sep 23, 2023		Soil	M23-Se0065163		X		
70	MW01_2.0	Sep 23, 2023		Soil	M23-Se0065164		X		
71	MW01_2.5	Sep 23, 2023		Soil	M23-Se0065165		X		
72	MW01_3.0	Sep 23, 2023		Soil	M23-Se0065166		X		
73	MW01_3.5	Sep 23, 2023		Soil	M23-Se0065167		X		
74	MW01_4.0	Sep 23, 2023		Soil	M23-Se0065168		X		
75	MW01_15	Sep 23, 2023		Soil	M23-Se0065169		X		
76	MW02_0.1	Sep 22, 2023		Soil	M23-Se0065170		X		
77	MW02_1.0	Sep 21, 2023		Soil	M23-Se0065171		X		

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Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
78	MW02_1.5	Sep 21, 2023		Soil	M23-Se0065172		X		
79	MW02_2.0	Sep 21, 2023		Soil	M23-Se0065173		X		
80	MW02_2.5	Sep 21, 2023		Soil	M23-Se0065174		X		
81	MW02_3.0	Sep 21, 2023		Soil	M23-Se0065175		X		
82	MW02_3.5	Sep 21, 2023		Soil	M23-Se0065176		X		
83	MW02_4.0	Sep 21, 2023		Soil	M23-Se0065177		X		
84	MW02_4.5	Sep 21, 2023		Soil	M23-Se0065178		X		
85	MW02_5.0	Sep 21, 2023		Soil	M23-Se0065179		X		
86	MW02_6.0	Sep 21, 2023		Soil	M23-Se0065180		X		
87	MW02_6.5	Sep 21, 2023		Soil	M23-Se0065181		X		
88	MW02_7.0	Sep 21, 2023		Soil	M23-Se0065182		X		
89	MW02_7.5	Sep 21, 2023		Soil	M23-Se0065183		X		
90	MW02_8.0	Sep 21, 2023		Soil	M23-Se0065184		X		
91	MW02_8.5	Sep 21, 2023		Soil	M23-Se0065185		X		
92	MW02_9.0	Sep 21, 2023		Soil	M23-Se0065186		X		
93	MW02_9.5	Sep 21, 2023		Soil	M23-Se0065187		X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
94	MW02_10.0	Sep 21, 2023		Soil	M23-Se0065188		X		
95	MW02_12.0	Sep 21, 2023		Soil	M23-Se0065189		X		
96	MW02_15.0	Sep 21, 2023		Soil	M23-Se0065190		X		
97	MW03_0.1	Sep 23, 2023		Soil	M23-Se0065191		X		
98	MW03_1.0	Sep 23, 2023		Soil	M23-Se0065192		X		
99	MW03_1.5	Sep 23, 2023		Soil	M23-Se0065193		X		
100	MW03_2.0	Sep 23, 2023		Soil	M23-Se0065194		X		
101	MW03_2.5	Sep 23, 2023		Soil	M23-Se0065195		X		
102	MW03_3.5	Sep 23, 2023		Soil	M23-Se0065196		X		
103	MW03_14.0	Sep 23, 2023		Soil	M23-Se0065197		X		
104	FD01	Sep 22, 2023		Soil	M23-Se0065198		X		
105	FS01	Sep 22, 2023		Soil	M23-Se0065199		X		
106	FD02	Sep 22, 2023		Soil	M23-Se0065200		X		
107	FS02	Sep 22, 2023		Soil	M23-Se0065201		X		
108	FD05	Sep 23, 2023		Soil	M23-Se0065202		X		
109	FS05	Sep 23, 2023		Soil	M23-Se0065203		X		

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Sample Detail						CANCELLED	HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
110	FD07	Sep 24, 2023		Soil	M23-Se0065204		X		
111	FS07	Sep 24, 2023		Soil	M23-Se0065205		X		
Test Counts						3	80	24	28

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**µg/L:** micrograms per litre
ppm: parts per million	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	85			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	70			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	92			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	82			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	99			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	85			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	87			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	96			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	87			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	97			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	92			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	90			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	88			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	86			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	86			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	86			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	78			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	87			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	72			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	100			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	83			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	73			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	88			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	74			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	74			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	91			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	81			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	85			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Se0065108	CP	%	75			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0065108	CP	%	68			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0065108	CP	%	89			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0065108	CP	%	81			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0065108	CP	%	85			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0065108	CP	%	88			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0065108	CP	%	86			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0065108	CP	%	89			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0065108	CP	%	86			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0065108	CP	%	86			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0065108	CP	%	92			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Se0065108	CP	%	88			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0065108	CP	%	91			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0065108	CP	%	91			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0065108	CP	%	83			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0065108	CP	%	87			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0065108	CP	%	81			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0065108	CP	%	85			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Se0065108	CP	%	65			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0065108	CP	%	83			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0065108	CP	%	76			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0065108	CP	%	65			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0065108	CP	%	82			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0065108	CP	%	79			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0065108	CP	%	102			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0065108	CP	%	81			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Se0065108	CP	%	77			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0065108	CP	%	85			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0065108	CP	%	87			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0065108	CP	%	86			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Se0065118	CP	%	80			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0065118	CP	%	81			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0065118	CP	%	81			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0065118	CP	%	75			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0065118	CP	%	82			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0065118	CP	%	82			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0065118	CP	%	76			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0065118	CP	%	77			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0065118	CP	%	74			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0065118	CP	%	69			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0065118	CP	%	74			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Se0065118	CP	%	82			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0065118	CP	%	79			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0065118	CP	%	83			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0065118	CP	%	73			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0065118	CP	%	78			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0065118	CP	%	74			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0065118	CP	%	78			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Se0065118	CP	%	73			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0065118	CP	%	79			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0065118	CP	%	91			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0065118	CP	%	72			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0065118	CP	%	75			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0065118	CP	%	54			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0065118	CP	%	78			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Se0065118	CP	%	73			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0065118	CP	%	70			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0065118	CP	%	78			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0065118	CP	%	84			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0065096	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0065096	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0065096	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0065096	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-Se0065104	CP	%	15	14	13	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0065107	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0065107	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0065107	CP	ug/kg	7.5	6.7	11	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0065107	CP	ug/kg	7.0	6.2	13	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0065107	CP	ug/kg	180	160	12	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0065107	CP	ug/kg	10	8.7	17	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0065107	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0065107	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-Se0065114	CP	%	6.7	8.2	20	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorododecanoic acid (PFDoDA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0065117	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0065117	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0065117	CP	ug/kg	43	46	7.4	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0065117	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0065117	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Amy Meunier	Analytical Services Manager
Joseph Edouard	Senior Analyst-PFAS
Mary Makarios	Senior Analyst-Sample Properties



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address
Level 4 - 211 Victoria Square, Adelaide SA 5000
Telephone: (08) 8111 6600

Completion Date / Turnaround
STANDARD

Quote #
Quote 230726GHDS

Project Number
12516806
Project Name
MFS Peterborough DSI
GHD Project Manager
Tom Duncan
GHD Contact
Josh Anderson
GHD PM email
Tom.Duncan@ghd.com
GHD Contact email
Josh.Anderson7@ghd.com

Laboratory
Eurofins
Laboratory Address
6 Monterey Road, Dandenong VIC 3175
Laboratory Contact
Amy Meurer

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on receipt and release of samples, between each party.
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf forms and ESDAT forms.

Sample I.D.	Date and Time	Composite Sample	Sample Matrix (S: Soil, SL: Sludge, W: Water, L: Leachate, GW: Groundwater)	Preservative	Containers: Type (J: soil jar, B: bag, V: vial, G: glass bottle, P: plastic bottle)	Containers: Number	Containers: Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ENVIROLAB	SAMPLE COMMENTS
MW01	27-Sep-23		GW	Ice	P	2		X			
MW02	27-Sep-23		GW	Ice	P	2		X			
MW03	27-Sep-23		GW	Ice	P	2		X			
RB01	27-Sep-23		GW	Ice	P	2		X			
FB01	27-Sep-23		GW	Ice	P	2		X			
FD01	27-Sep-23		GW	Ice	P	2		X			
FS01	27-Sep-23		GW	Ice	P	2		X		X	Please forward to envirolab
TOTAL NUMBER OF SAMPLES	7										
TOTAL NUMBER OF ESKIES	1										

CUSTODY DETAILS

SAMPLER	Date/Time	Relinquished by:	Date/Time
GHD SERVICE CENTRE Received by:	Date/Time	Relinquished by:	Date/Time
COURIER Received by Courier:	Date/Time	Relinquished by:	Date/Time
LABORATORY Received by Lab:	Date/Time		

#1031206
3/10/23

COPY

3

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address
Level 4 - 211 Victoria Square, Adelaide SA 5000
Telephone: (08) 8111 6600

Completion Date / Turnaround
STANDARD

Quote #
Quote 230726GHDS

Project number
12516808

Project Name
MFB Peterborough CBI

GHD Project Manager
Tom Duncan

GHD Contact
Josh Anderson

GHD PM email
Tom.Duncan@ghd.com

GHD Contact email
Josh.Anderson2@ghd.com

Laboratory
Eurofins

Laboratory Address
6 Monterey Road, Dandenong VIC 3175

Laboratory Contact
Amy Meunier

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on receipt and release of samples, between each party
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and EDDAT format

Sample I.D.	Date and Time	Composite Sample	Sample Matrix (Soil, Water, Leachate, Gas)	Preservative	Containers: Type (Glass Jar, Bag, Vial, Other, Plastic bottle)	Containers: Number	Containers: Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ENVIROLAB
MW01	27-Sep-23		GW	Ice	P	2		X		
MW02	27-Sep-23		GW	Ice	P	2		X		
MW03	27-Sep-23		GW	Ice	P	2		X		
RB01	27-Sep-23		GW	Ice	P	2		X		
FB01	27-Sep-23		GW	Ice	P	2		X		
FD01	27-Sep-23		GW	Ice	P	2		X		
FS01	27-Sep-23		GW	Ice	P	2		X		
									X	Please forward to envirolab
TOTAL NUMBER OF SAMPLES	7									
TOTAL NUMBER OF ESKIES	1									

SAMPLE COMMENTS

CUSTODY DETAILS
SAMPLER

GHD SERVICE CENTRE Received by:	Date/Time	Relinquished by:	Date/Time
COURIER Received by Courier:	Date/Time	Relinquished by:	Date/Time
LABORATORY Received by Lab:	Date/Time	Relinquished by:	Date/Time

#1031206
3/10/23

Tyrone Gowans

From: Amy Meunier
Sent: Tuesday, 3 October 2023 2:48 PM
To: #AU_CAU001_EnviroSampleVic
Subject: FW: 12616805 12616806 12616807 COCs
Attachments: 12616805_12616806_12616807 _COCs-combined.pdf

Follow Up Flag: Follow up
Flag Status: Completed

INFO: INTERNAL EMAIL - Sent from your own Eurofins email domain.

Hi Tyrone – COC attached for samples received.

Kind regards,

Amy Meunier

Analytical Services Manager
Mobile : +61 477 574 867
Email : AmyMeunier@eurofins.com

Eurofins
6 Monterey Road,
Dandenong VIC 3175
Australia

My office hours are 9am to 5:30pm (Monday to Friday)
If you require sample receipt outside these hours please email envirosamplevic@eurofins.com

eurofins Total Sulfur in Soils by LECO, NATA Accredited LEARN MORE

From: Ally Kirkman <Ally.Kirkman@ghd.com>
Sent: Tuesday, 3 October 2023 1:59 PM
To: Amy Meunier <AmyMeunier@eurofins.com>
Cc: Ben Petticrew <Ben.Petticrew@ghd.com>; Tom Duncan <Thomas.Duncan@ghd.com>
Subject: RE: 12616805 12616806 12616807 COCs

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins. Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Amy,

My apologies, please find the COCs attached (one combined file).

#103206
3/10/23

Let me know if you have any queries.

Cheers,
Ally

From: Amy Meunier <AmyMeunier@eurofins.com>
Sent: Tuesday, October 3, 2023 12:51 PM

eurofins | Environment Testing

PROJECT INFORMATION

Date Received: 29/09/2023

Company: GHD

Contact person: Tom Duncan

Contact Number: 0413476581

Contact E-mail: thomas.Duncan@ghd.com

Project Name/site: Port Augusta GME, Port Pirie GME, Peterborough GME - MFS

Project Number: Port Pirie - 12616807
Port Augusta - 12616805
Peterborough - 12616806

COC: Attached ☐
E-mailed ☐
Not received ☐

17.0°C
-0.3°C
16.7°C on IB.

#1031199
3/10/23

Last modified on: 16 October 2019	Approved on: 16 October 2019	Version: QS1039_R2
Last modified by: H. Le	Approver: M. Makarios	Page 1 of 1
Editorial Committee: T. Lakeland, F. Sanjaya, H. Le, M. Makarios		Next required review date: 16 October 2022

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521
Phone: +61 3 8564 5000
e.mail: EnviroRemittances@eurofins.com

Tax Invoice

GHD Pty Ltd
FSS Accounts - Newcastle
Hunter Region Mail Centre
NSW 2310

Purchase Order #:	Not provided
Invoice #:	807187
Date:	Oct 6, 2023
Report #:	1031206
Project Name:	MFS PETERBOROUGH DSI
Project ID:	12616806
Contact:	Tom Duncan

Description	Quantity	Price	Total	Notes
Liquid Samples				
Per- and Polyfluoroalkyl Substances (PFASs)	6	$102.50	$615.00	
Handling Charge	1	$30.00	$30.00	
Split sample couriered to external lab	1	$45.00	$45.00	

Notes: Quote: 230726GHDS	Nett Total (AUD)	$690.00
	GST10%	$69.00
	Total Inc GST (AUD)	$759.00

This invoice is subject to Eurofins General Terms of Sales.

Please detach and return with payment to:
Postal:
Eurofins Environment Testing
6 Monterey Road
Dandenong South
Victoria, 3175

Please EFT Payments to:
Eurofins Environment Testing
BSB 063-498
Acct No: 10057019
e.mail Remittances:
EnviroRemittances@eurofins.com

Invoice Number : 807187
Amount Inc GST (AUD): $759.00

TERMS STRICTLY 30 DAYS

eurofins | Environment Testing

www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd

ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Tom Duncan
Project name:	MFS PETERBOROUGH DSI
Project ID:	12616806
Turnaround time:	5 Day
Date/Time received	Oct 3, 2023 1:59 PM
Eurofins reference	1031206

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✓	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Amy Meunier on phone : or by email: AmyMeunier@eurofins.com

Results will be delivered electronically via email to Tom Duncan - tom.duncan@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd SA email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd
ABN: 91 05 0159 898

Perth
46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

Auckland	Christchurch	Tauranga
35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
Adelaide
SA 5001

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1031206
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Oct 3, 2023 1:59 PM
Due: Oct 10, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	MW01	Sep 27, 2023		Water	M23-Oc0004533	X
2	MW02	Sep 27, 2023		Water	M23-Oc0004534	X
3	MW03	Sep 27, 2023		Water	M23-Oc0004535	X
4	RB01	Sep 27, 2023		Water	M23-Oc0004536	X
5	FB01	Sep 27, 2023		Water	M23-Oc0004537	X
6	FD01	Sep 27, 2023		Water	M23-Oc0004538	X
Test Counts						6

GHD Pty Ltd
GPO Box 2052
Adelaide
SA 5001

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Tom Duncan**

Report **1031206-W**
Project name MFS PETERBOROUGH DSI
Project ID 12616806
Received Date Oct 03, 2023

Client Sample ID			**MW01**	**MW02**	**MW03**	**RB01**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**M23-Oc0004533**	**M23-Oc0004534**	**M23-Oc0004535**	**M23-Oc0004536**
Date Sampled			**Sep 27, 2023**	**Sep 27, 2023**	**Sep 27, 2023**	**Sep 27, 2023**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	0.84	0.16	0.44	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.87	0.24	0.83	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	5.0	1.1	3.5	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	[N09]0.69	[N09]0.06	[N09]0.46	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]0.90	[N09]0.05	[N09]0.81	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	94	89	95	63
13C5-PFPeA (surr.)	1	%	135	77	88	95
13C5-PFHxA (surr.)	1	%	127	77	120	101
13C4-PFHpA (surr.)	1	%	124	100	82	97
13C8-PFOA (surr.)	1	%	111	106	57	113
13C5-PFNA (surr.)	1	%	100	98	89	98
13C6-PFDA (surr.)	1	%	115	104	106	129
13C2-PFUnDA (surr.)	1	%	136	94	107	117
13C2-PFDoDA (surr.)	1	%	118	89	96	121
13C2-PFTeDA (surr.)	1	%	80	55	59	77
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	95	92	84	93
D3-N-MeFOSA (surr.)	1	%	87	77	76	82

Client Sample ID			MW01	MW02	MW03	RB01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M23-Oc0004533	M23-Oc0004534	M23-Oc0004535	M23-Oc0004536
Date Sampled			Sep 27, 2023	Sep 27, 2023	Sep 27, 2023	Sep 27, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	99	86	86	91
D7-N-MeFOSE (surr.)	1	%	83	76	81	92
D9-N-EtFOSE (surr.)	1	%	83	70	69	78
D5-N-EtFOSAA (surr.)	1	%	87	64	70	85
D3-N-MeFOSAA (surr.)	1	%	88	72	77	87
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	[N09]4.1	0.89	[N09]2.9	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	1.3	0.41	0.87	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]5.5	[N09]0.64	[N09]3.4	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]48	[N09]2.9	[N09]28	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]0.87	[N09]0.07	[N09]0.57	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]1.0	[N09]0.52	[N09]0.70	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	120	78	119	101
18O2-PFHxS (surr.)	1	%	109	74	109	91
13C8-PFOS (surr.)	1	%	108	65	118	95
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	0.13	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	95	109	93	101
13C2-6:2 FTSA (surr.)	1	%	57	92	73	88
13C2-8:2 FTSA (surr.)	1	%	68	74	72	84
13C2-10:2 FTSA (surr.)	1	%	90	64	71	90
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	49	3.42	28.7	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	1.9	0.57	1.51	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	49.9	3.47	29.51	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	61.53	5.92	37.64	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	69.2	7.04	42.48	< 0.1

Client Sample ID			FB01	FD01
Sample Matrix			Water	Water
Eurofins Sample No.			M23-Oc0004537	M23-Oc0004538
Date Sampled			Sep 27, 2023	Sep 27, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	0.16
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	0.23
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	1.1
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	[N09]0.06
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	[N09]0.05

Client Sample ID			FB01	FD01
Sample Matrix			Water	Water
Eurofins Sample No.			M23-Oc0004537	M23-Oc0004538
Date Sampled			Sep 27, 2023	Sep 27, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	55	84
13C5-PFPeA (surr.)	1	%	103	102
13C5-PFHxA (surr.)	1	%	114	87
13C4-PFHpA (surr.)	1	%	111	103
13C8-PFOA (surr.)	1	%	133	113
13C5-PFNA (surr.)	1	%	106	100
13C6-PFDA (surr.)	1	%	115	117
13C2-PFUnDA (surr.)	1	%	105	110
13C2-PFDoDA (surr.)	1	%	91	103
13C2-PFTeDA (surr.)	1	%	74	69
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	97	98
D3-N-MeFOSA (surr.)	1	%	78	104
D5-N-EtFOSA (surr.)	1	%	80	114
D7-N-MeFOSE (surr.)	1	%	84	84
D9-N-EtFOSE (surr.)	1	%	79	81
D5-N-EtFOSAA (surr.)	1	%	105	74
D3-N-MeFOSAA (surr.)	1	%	83	76
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	[N09]0.91
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	0.48
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	[N09]0.77
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	[N09]3.0
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	[N09]0.06
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	[N09]0.51
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	104	93
18O2-PFHxS (surr.)	1	%	103	75
13C8-PFOS (surr.)	1	%	105	68

Client Sample ID			FB01	FD01
Sample Matrix			Water	Water
Eurofins Sample No.			M23-Oc0004537	M23-Oc0004538
Date Sampled			Sep 27, 2023	Sep 27, 2023
Test/Reference	LOR	Unit		
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	107	111
13C2-6:2 FTSA (surr.)	1	%	61	95
13C2-8:2 FTSA (surr.)	1	%	71	84
13C2-10:2 FTSA (surr.)	1	%	106	68
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	3.51
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	0.56
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	3.56
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	6.02
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	7.33

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Oct 04, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Oct 04, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Oct 04, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Oct 04, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Oct 03, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Eurofins Environment Testing Australia Pty Ltd
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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1031206
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Oct 3, 2023 1:59 PM
Due: Oct 10, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	MW01	Sep 27, 2023		Water	M23-Oc0004533	X
2	MW02	Sep 27, 2023		Water	M23-Oc0004534	X
3	MW03	Sep 27, 2023		Water	M23-Oc0004535	X
4	RB01	Sep 27, 2023		Water	M23-Oc0004536	X
5	FB01	Sep 27, 2023		Water	M23-Oc0004537	X
6	FD01	Sep 27, 2023		Water	M23-Oc0004538	X
Test Counts						6

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**µg/L:** micrograms per litre
ppm: parts per million	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	78			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	76			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	77			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	67			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	65			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	64			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	78			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	69			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	82			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	61			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	82			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	98			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	80			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	108			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	82			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	76			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	78			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	78			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	82			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	77			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	85			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	67			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	76			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	80			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	75			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	64			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	75			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	84			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	81			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	76			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Oc0001079	NCP	%	77			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Oc0004441	NCP	%	73			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0068009	NCP	%	128			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Oc0008822	NCP	%	68			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Oc0008822	NCP	%	67			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Oc0004441	NCP	%	70			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Oc0004441	NCP	%	79			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Oc0004441	NCP	%	79			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Oc0004441	NCP	%	77			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Oc0004441	NCP	%	61			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Oc0004441	NCP	%	82			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Oc0004441	NCP	%	87			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Oc0004441	NCP	%	83			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Oc0004441	NCP	%	85			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Oc0004441	NCP	%	93			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Oc0004441	NCP	%	73			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Oc0004441	NCP	%	71			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Oc0004441	NCP	%	81			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Oc0008822	NCP	%	77			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Oc0004441	NCP	%	76			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Oc0008822	NCP	%	70			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Oc0008822	NCP	%	68			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Oc0008822	NCP	%	69			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Oc0004441	NCP	%	94			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Oc0001079	NCP	%	59			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Oc0004441	NCP	%	69			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Oc0004441	NCP	%	71			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Oc0004441	NCP	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Oc0004441	NCP	%	77			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Oc0004441	NCP	%	81			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Oc0005886	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Oc0004477	NCP	ug/L	0.11	0.11	3.1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Amy Meunier	Analytical Services Manager
Joseph Edouard	Senior Analyst-PFAS



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address
Level 4 - 211 Victoria Square, Adelaide SA 5000
Telephone: (08) 8111 6600

Completion Date / Turnaround
STANDARD

Quote #
Quote 230726GHDS

Project Number
12516806
Project Name
MFS Peterborough DSI
GHD Project Manager
Tom Duncan
GHD Contact
Josh Anderson
GHD PM email
Tom.Duncan@ghd.com
GHD Contact email
Josh.Anderson7@ghd.com

Laboratory
Eurofins
Laboratory Address
6 Monterey Road, Dandenong VIC 3175
Laboratory Contact
Amy Meurer

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on receipt and release of samples, between each party.
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf forms and ESDAT forms.

Sample I.D.	Date and Time	Composite Sample	Sample Matrix (S: Soil, SL: Sludge, W: Water, L: Leachate, GW: Groundwater)	Preservative	Containers: Type (J: soil jar, B: bag, V: vial, G: glass bottle, P: plastic bottle)	Containers: Number	Containers: Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ENVIROLAB	SAMPLE COMMENTS
MW01	27-Sep-23		GW	Ice	P	2		X			
MW02	27-Sep-23		GW	Ice	P	2		X			
MW03	27-Sep-23		GW	Ice	P	2		X			
RB01	27-Sep-23		GW	Ice	P	2		X			
FB01	27-Sep-23		GW	Ice	P	2		X			
FD01	27-Sep-23		GW	Ice	P	2		X			
FS01	27-Sep-23		GW	Ice	P	2		X		X	Please forward to envirolab
TOTAL NUMBER OF SAMPLES	7										
TOTAL NUMBER OF ESKIES	1										

CUSTODY DETAILS

SAMPLER	Date/Time	Relinquished by:	Date/Time
GHD SERVICE CENTRE Received by:	Date/Time	Relinquished by:	Date/Time
COURIER Received by Courier:	Date/Time	Relinquished by:	Date/Time
LABORATORY Received by Lab:	Date/Time		

#1031206
3/10/23

COPY

3

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address
Level 4 - 211 Victoria Square, Adelaide SA 5000
Telephone: (08) 8111 6600

Completion Date / Turnaround
STANDARD

Quote #
Quote 230726GHDS

Project number
12516808

Project Name
MFB Peterborough CBI

GHD Project Manager
Tom Duncan

GHD Contact
Josh Anderson

GHD PM email
Tom.Duncan@ghd.com

GHD Contact email
Josh.Anderson2@ghd.com

Laboratory
Eurofins

Laboratory Address
6 Monterey Road, Dandenong VIC 3175

Laboratory Contact
Amy Meunier

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on receipt and release of samples, between each party
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and EDDAT format

Sample I.D.	Date and Time	Composite Sample	Sample Matrix (Soil, Water, Leachate, Gas)	Preservative	Containers: Type (Glass Jar, Bag, Vial, Other, Plastic bottle)	Containers: Number	Containers: Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ENVIROLAB
MW01	27-Sep-23		GW	Ice	P	2		X		
MW02	27-Sep-23		GW	Ice	P	2		X		
MW03	27-Sep-23		GW	Ice	P	2		X		
RB01	27-Sep-23		GW	Ice	P	2		X		
FB01	27-Sep-23		GW	Ice	P	2		X		
FD01	27-Sep-23		GW	Ice	P	2		X		
FS01	27-Sep-23		GW	Ice	P	2		X		
									X	Please forward to envirolab
TOTAL NUMBER OF SAMPLES	7									
TOTAL NUMBER OF ESKIES	1									

SAMPLE COMMENTS

CUSTODY DETAILS
SAMPLER

GHD SERVICE CENTRE Received by:	Date/Time	Relinquished by:	Date/Time
COURIER Received by Courier:	Date/Time	Relinquished by:	Date/Time
LABORATORY Received by Lab:	Date/Time	Relinquished by:	Date/Time

#1031206
3/10/23

Tyrone Gowans

From: Amy Meunier
Sent: Tuesday, 3 October 2023 2:48 PM
To: #AU_CAU001_EnviroSampleVic
Subject: FW: 12616805 12616806 12616807 COCs
Attachments: 12616805_12616806_12616807 _COCs-combined.pdf

Follow Up Flag: Follow up
Flag Status: Completed

INFO: INTERNAL EMAIL - Sent from your own Eurofins email domain.

Hi Tyrone – COC attached for samples received.

Kind regards,

Amy Meunier

Analytical Services Manager
Mobile : +61 477 574 867
Email : AmyMeunier@eurofins.com

Eurofins
6 Monterey Road,
Dandenong VIC 3175
Australia

My office hours are 9am to 5:30pm (Monday to Friday)
If you require sample receipt outside these hours please email envirosamplevic@eurofins.com

eurofins Total Sulfur in Soils by LECO, NATA Accredited LEARN MORE

From: Ally Kirkman <Ally.Kirkman@ghd.com>
Sent: Tuesday, 3 October 2023 1:59 PM
To: Amy Meunier <AmyMeunier@eurofins.com>
Cc: Ben Petticrew <Ben.Petticrew@ghd.com>; Tom Duncan <Thomas.Duncan@ghd.com>
Subject: RE: 12616805 12616806 12616807 COCs

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins. Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Amy,

My apologies, please find the COCs attached (one combined file).

#103206
3/10/23

Let me know if you have any queries.

Cheers,
Ally

From: Amy Meunier <AmyMeunier@eurofins.com>
Sent: Tuesday, October 3, 2023 12:51 PM

eurofins | Environment Testing

PROJECT INFORMATION

Date Received: 29/09/2023

Company: GHD

Contact person: Tom Duncan

Contact Number: 0413476581

Contact E-mail: thomas.Duncan@ghd.com

Project Name/site: Port Augusta GME, Port Pirie GME, Peterborough GME - MFS

Project Number: Port Pirie - 12616807
Port Augusta - 12616805
Peterborough - 12616806

COC: Attached ☐
E-mailed ☐
Not received ☐

17.0°C
-0.3°C
16.7°C on IB.

#1031199
3/10/23

Last modified on: 16 October 2019	Approved on: 16 October 2019	Version: QS1039_R2
Last modified by: H. Le	Approver: M. Makarios	Page 1 of 1
Editorial Committee: T. Lakeland, F. Sanjaya, H. Le, M. Makarios		Next required review date: 16 October 2022

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www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

Eurofins ARL Pty Ltd

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Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377
Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland	Christchurch	Tauranga
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Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Tom Duncan
Project name:	MFS PETERBOROUGH DSI
Project ID:	12616806
Turnaround time:	5 Day
Date/Time received	Oct 3, 2023 1:59 PM
Eurofins reference	1031206

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✓	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Amy Meunier on phone : or by email: AmyMeunier@eurofins.com

Results will be delivered electronically via email to Tom Duncan - tom.duncan@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd SA email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Site# 2370

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Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
Adelaide
SA 5001

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1031206
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Oct 3, 2023 1:59 PM
Due: Oct 10, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	MW01	Sep 27, 2023		Water	M23-Oc0004533	X
2	MW02	Sep 27, 2023		Water	M23-Oc0004534	X
3	MW03	Sep 27, 2023		Water	M23-Oc0004535	X
4	RB01	Sep 27, 2023		Water	M23-Oc0004536	X
5	FB01	Sep 27, 2023		Water	M23-Oc0004537	X
6	FD01	Sep 27, 2023		Water	M23-Oc0004538	X
Test Counts						6

GHD Pty Ltd
GPO Box 2052
Adelaide
SA 5001

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Tom Duncan**

Report **1031206-W**
Project name MFS PETERBOROUGH DSI
Project ID 12616806
Received Date Oct 03, 2023

Client Sample ID			**MW01**	**MW02**	**MW03**	**RB01**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**M23-Oc0004533**	**M23-Oc0004534**	**M23-Oc0004535**	**M23-Oc0004536**
Date Sampled			**Sep 27, 2023**	**Sep 27, 2023**	**Sep 27, 2023**	**Sep 27, 2023**
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	0.84	0.16	0.44	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.87	0.24	0.83	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	5.0	1.1	3.5	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	[N09]0.69	[N09]0.06	[N09]0.46	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	[N09]0.90	[N09]0.05	[N09]0.81	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	94	89	95	63
13C5-PFPeA (surr.)	1	%	135	77	88	95
13C5-PFHxA (surr.)	1	%	127	77	120	101
13C4-PFHpA (surr.)	1	%	124	100	82	97
13C8-PFOA (surr.)	1	%	111	106	57	113
13C5-PFNA (surr.)	1	%	100	98	89	98
13C6-PFDA (surr.)	1	%	115	104	106	129
13C2-PFUnDA (surr.)	1	%	136	94	107	117
13C2-PFDoDA (surr.)	1	%	118	89	96	121
13C2-PFTeDA (surr.)	1	%	80	55	59	77
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	95	92	84	93
D3-N-MeFOSA (surr.)	1	%	87	77	76	82

Client Sample ID			MW01	MW02	MW03	RB01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M23-Oc0004533	M23-Oc0004534	M23-Oc0004535	M23-Oc0004536
Date Sampled			Sep 27, 2023	Sep 27, 2023	Sep 27, 2023	Sep 27, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D5-N-EtFOSA (surr.)	1	%	99	86	86	91
D7-N-MeFOSE (surr.)	1	%	83	76	81	92
D9-N-EtFOSE (surr.)	1	%	83	70	69	78
D5-N-EtFOSAA (surr.)	1	%	87	64	70	85
D3-N-MeFOSAA (surr.)	1	%	88	72	77	87
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	[N09]4.1	0.89	[N09]2.9	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	1.3	0.41	0.87	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	[N09]5.5	[N09]0.64	[N09]3.4	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]48	[N09]2.9	[N09]28	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	[N09]0.87	[N09]0.07	[N09]0.57	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]1.0	[N09]0.52	[N09]0.70	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	120	78	119	101
18O2-PFHxS (surr.)	1	%	109	74	109	91
13C8-PFOS (surr.)	1	%	108	65	118	95
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	0.13	< 0.05	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	95	109	93	101
13C2-6:2 FTSA (surr.)	1	%	57	92	73	88
13C2-8:2 FTSA (surr.)	1	%	68	74	72	84
13C2-10:2 FTSA (surr.)	1	%	90	64	71	90
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	49	3.42	28.7	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	1.9	0.57	1.51	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	49.9	3.47	29.51	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	61.53	5.92	37.64	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	69.2	7.04	42.48	< 0.1

Client Sample ID			FB01	FD01
Sample Matrix			Water	Water
Eurofins Sample No.			M23-Oc0004537	M23-Oc0004538
Date Sampled			Sep 27, 2023	Sep 27, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	0.16
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	0.23
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	1.1
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	[N09]0.06
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	[N09]0.05

Client Sample ID			FB01	FD01
Sample Matrix			Water	Water
Eurofins Sample No.			M23-Oc0004537	M23-Oc0004538
Date Sampled			Sep 27, 2023	Sep 27, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	55	84
13C5-PFPeA (surr.)	1	%	103	102
13C5-PFHxA (surr.)	1	%	114	87
13C4-PFHpA (surr.)	1	%	111	103
13C8-PFOA (surr.)	1	%	133	113
13C5-PFNA (surr.)	1	%	106	100
13C6-PFDA (surr.)	1	%	115	117
13C2-PFUnDA (surr.)	1	%	105	110
13C2-PFDoDA (surr.)	1	%	91	103
13C2-PFTeDA (surr.)	1	%	74	69
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	97	98
D3-N-MeFOSA (surr.)	1	%	78	104
D5-N-EtFOSA (surr.)	1	%	80	114
D7-N-MeFOSE (surr.)	1	%	84	84
D9-N-EtFOSE (surr.)	1	%	79	81
D5-N-EtFOSAA (surr.)	1	%	105	74
D3-N-MeFOSAA (surr.)	1	%	83	76
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	[N09]0.91
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	0.48
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	[N09]0.77
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	[N09]3.0
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	[N09]0.06
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	[N09]0.51
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	104	93
18O2-PFHxS (surr.)	1	%	103	75
13C8-PFOS (surr.)	1	%	105	68

Client Sample ID			FB01	FD01
Sample Matrix			Water	Water
Eurofins Sample No.			M23-Oc0004537	M23-Oc0004538
Date Sampled			Sep 27, 2023	Sep 27, 2023
Test/Reference	LOR	Unit		
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	107	111
13C2-6:2 FTSA (surr.)	1	%	61	95
13C2-8:2 FTSA (surr.)	1	%	71	84
13C2-10:2 FTSA (surr.)	1	%	106	68
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	3.51
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	0.56
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	3.56
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	6.02
Sum of PFASs (n=30)*	0.1	ug/L	< 0.1	7.33

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Oct 04, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Oct 04, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Oct 04, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Oct 04, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Oct 03, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

eurofins

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1031206
Phone: 08 8111 6600
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Received: Oct 3, 2023 1:59 PM
Due: Oct 10, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X
External Laboratory						
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**	
1	MW01	Sep 27, 2023		Water	M23-Oc0004533	X
2	MW02	Sep 27, 2023		Water	M23-Oc0004534	X
3	MW03	Sep 27, 2023		Water	M23-Oc0004535	X
4	RB01	Sep 27, 2023		Water	M23-Oc0004536	X
5	FB01	Sep 27, 2023		Water	M23-Oc0004537	X
6	FD01	Sep 27, 2023		Water	M23-Oc0004538	X
Test Counts						6

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram	**mg/L:** milligrams per litre	**µg/L:** micrograms per litre
ppm: parts per million	**ppb:** parts per billion	**%:** Percentage
org/100 mL: Organisms per 100 millilitres	**NTU:** Nephelometric Turbidity Units	**MPN/100 mL:** Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit		

Terms

APHA	American Public Health Association
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment however free tributyltin was measured and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.4 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/L	< 0.05			0.05	Pass	
Perfluoropentanoic acid (PFPeA)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanoic acid (PFHxA)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanoic acid (PFOA)	ug/L	< 0.01			0.01	Pass	
Perfluorononanoic acid (PFNA)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanoic acid (PFDA)	ug/L	< 0.01			0.01	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/L	< 0.01			0.01	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/L	< 0.01			0.01	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/L	< 0.01			0.01	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/L	< 0.05			0.05	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/L	< 0.05			0.05	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/L	< 0.05			0.05	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/L	< 0.05			0.05	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/L	< 0.05			0.05	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/L	< 0.05			0.05	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/L	< 0.05			0.05	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/L	< 0.01			0.01	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/L	< 0.01			0.01	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/L	< 0.01			0.01	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/L	< 0.01			0.01	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/L	< 0.01			0.01	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/L	< 0.01			0.01	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/L	< 0.01			0.01	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/L	< 0.01			0.01	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/L	< 0.05			0.05	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/L	< 0.01			0.01	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/L	< 0.01			0.01	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	78			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	76			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	77			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	67			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	65			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	64			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	78			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	69			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	82			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	61			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	82			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	98			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	80			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	108			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	82			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	76			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	78			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	78			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	82			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	77			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	85			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	67			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	76			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	80			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	75			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	64			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	75			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	84			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	81			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	76			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Oc0001079	NCP	%	77			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Oc0004441	NCP	%	73			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0068009	NCP	%	128			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Oc0008822	NCP	%	68			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Oc0008822	NCP	%	67			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Oc0004441	NCP	%	70			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Oc0004441	NCP	%	79			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Oc0004441	NCP	%	79			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Oc0004441	NCP	%	77			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Oc0004441	NCP	%	61			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Oc0004441	NCP	%	82			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Oc0004441	NCP	%	87			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Oc0004441	NCP	%	83			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Oc0004441	NCP	%	85			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Oc0004441	NCP	%	93			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Oc0004441	NCP	%	73			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Oc0004441	NCP	%	71			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Oc0004441	NCP	%	81			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Oc0008822	NCP	%	77			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Oc0004441	NCP	%	76			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Oc0008822	NCP	%	70			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Oc0008822	NCP	%	68			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Oc0008822	NCP	%	69			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Oc0004441	NCP	%	94			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Oc0001079	NCP	%	59			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Oc0004441	NCP	%	69			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Oc0004441	NCP	%	71			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Oc0004441	NCP	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Oc0004441	NCP	%	77			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Oc0004441	NCP	%	81			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Oc0005886	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Oc0004477	NCP	ug/L	0.11	0.11	3.1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Oc0005886	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Oc0004477	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Oc0004477	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Amy Meunier	Analytical Services Manager
Joseph Edouard	Senior Analyst-PFAS



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Tyrone Gowans

From: Amy Meunier
Sent: Friday, 27 October 2023 11:28 AM
To: Ally Kirkman
Cc: GHD Lab Reports; Tom Duncan; #AU_CAU001_EnviroSampleVic
Subject: RE: Eurofins Test Results, Invoice - Report 1029914 : Site MFS PETERBOROUGH DSI (12616806)

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: ADDITIONALS

INFO: INTERNAL EMAIL - Sent from your own Eurofins email domain.

Hi Ally,

We will get this organised,

Tyrone – please see below, STD TAT

Kind regards,

Amy Meunier

Analytical Services Manager
Mobile : +61 477 574 867
Email : AmyMeunier@eurofins.com

Eurofins
6 Monterey Road,
Dandenong VIC 3175
Australia

#1038803

My office hours are 9am to 5:30pm (Monday to Friday)
If you require sample receipt outside these hours please email envirosamplevic@eurofins.com

eurofins Total Sulfur in Soils by LECO, NATA Accredited LEARN MORE

From: Ally Kirkman <ally.kirkman@ghd.com>
Sent: Friday, 27 October 2023 11:19 AM
To: Amy Meunier <AmyMeunier@eurofins.com>
Cc: GHD Lab Reports <GHDLabReports@ghd.com>; Tom Duncan <Thomas.Duncan@ghd.com>
Subject: RE: Eurofins Test Results, Invoice - Report 1029914 : Site MFS PETERBOROUGH DSI (12616806)

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Amy,

Please may we get the following sample also analysed for PFAS full-suite.

Job number: 12616806
Lab report number: 1029914
- FD05

Please also forward the following sample to ALS:
- FS05

Kind regards,
Ally

From: AmyMeunier@eurofins.com <AmyMeunier@eurofins.com>
Sent: Thursday, October 5, 2023 3:44 PM
To: Ally Kirkman <ally.kirkman@ghd.com>
Cc: GHD Lab Reports <GHDLabReports@ghd.com>; Tom Duncan <tom.duncan@ghd.com>
Subject: Eurofins Test Results, Invoice - Report 1029914 : Site MFS PETERBOROUGH DSI (12616806)

Hi Ally,

Please find attached results for your project in the subject header.

Kind regards,

Amy Meunier
Analytical Services Manager
Mobile : +61 477 574 867

Eurofins Environment Testing
6 Monterey Rd
Dandenong South VIC 3175
AUSTRALIA
Email : AmyMeunier@eurofins.com
Website : www.eurofins.com.au/environmental-testing
View our latest EnviroNotes



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www.eurofins.com.au EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

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6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Site# 2370

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Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Ally Kirkman
Project name:	MFS PETERBOROUGH DSI
Project ID:	12616806
Turnaround time:	5 Day
Date/Time received	Oct 27, 2023 11:28 AM
Eurofins reference	1038803

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✓	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Amy Meunier on phone : or by email: AmyMeunier@eurofins.com

Results will be delivered electronically via email to Ally Kirkman - ally.kirkman@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd SA email address.

eurofins

web: www.eurofins.com.au
email: EnviroSales@eurofins.com

Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
6 Monterey Road	19/8 Lewalan Street	179 Magowar Road	Unit 1,2 Dacre Street	1/21 Smallwood Place	1/2 Frost Drive
Dandenong South	Grovedale	Girraween	Mitchell	Murarrie	Mayfield West NSW 2304
VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
Adelaide
SA 5001

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1038803
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Oct 27, 2023 11:28 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FD05	Oct 24, 2023		Soil	M23-Oc0065660	X	X
Test Counts						1	1

GHD Pty Ltd
GPO Box 2052
Adelaide
SA 5001

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Ally Kirkman**

Report **1038803-S**
Project name MFS PETERBOROUGH DSI
Project ID 12616806
Received Date Oct 27, 2023

Client Sample ID			**FD05**
Sample Matrix			**Soil**
Eurofins Sample No.			**M23-Oc0065660**
Date Sampled			**Oct 24, 2023**
Test/Reference	LOR	Unit	
Sample Properties			
% Moisture	1	%	7.5
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5
13C4-PFBA (surr.)	1	%	87
13C5-PFPeA (surr.)	1	%	96
13C5-PFHxA (surr.)	1	%	91
13C4-PFHpA (surr.)	1	%	93
13C8-PFOA (surr.)	1	%	84
13C5-PFNA (surr.)	1	%	85
13C6-PFDA (surr.)	1	%	101
13C2-PFUnDA (surr.)	1	%	82
13C2-PFDoDA (surr.)	1	%	82
13C2-PFTeDA (surr.)	1	%	51
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10

Client Sample ID			FD05
Sample Matrix			Soil
Eurofins Sample No.			M23-Oc0065660
Date Sampled			Oct 24, 2023
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
13C8-FOSA (surr.)	1	%	73
D3-N-MeFOSA (surr.)	1	%	91
D5-N-EtFOSA (surr.)	1	%	85
D7-N-MeFOSE (surr.)	1	%	78
D9-N-EtFOSE (surr.)	1	%	78
D5-N-EtFOSAA (surr.)	1	%	74
D3-N-MeFOSAA (surr.)	1	%	85
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	[N09]16
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]19
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]320
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	[N09]18
13C3-PFBS (surr.)	1	%	91
18O2-PFHxS (surr.)	1	%	87
13C8-PFOS (surr.)	1	%	72
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5
13C2-4:2 FTSA (surr.)	1	%	79
13C2-6:2 FTSA (surr.)	1	%	64
13C2-8:2 FTSA (surr.)	1	%	73
13C2-10:2 FTSA (surr.)	1	%	77
PFASs Summations			
Sum (PFHxS + PFOS)*	5	ug/kg	339
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	320
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	339
Sum of WA DWER PFAS (n=10)*	10	ug/kg	339
Sum of PFASs (n=30)*	50	ug/kg	373

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Oct 27, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Oct 27, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Oct 27, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Oct 27, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Oct 27, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Oct 27, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Project ID: 12616806

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Received: Oct 27, 2023 11:28 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FD05	Oct 24, 2023		Soil	M23-Oc0065660	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30%; however the following acceptance guidelines are equally applicable: Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported, have been reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	72			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	54			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	65			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	71			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	69			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	78			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	73			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	73			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	78			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	61			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	65			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	78			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	76			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	76			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	74			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	68			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	73			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	71			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	52			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	77			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	60			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	51			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	73			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	70			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	70			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	61			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	66			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	63			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	67			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	66			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Oc0063842	NCP	%	80			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Oc0063842	NCP	%	62			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Oc0063842	NCP	%	84			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Oc0063842	NCP	%	75			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Oc0063842	NCP	%	86			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Oc0063842	NCP	%	81			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Oc0063842	NCP	%	79			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Oc0063842	NCP	%	80			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Oc0063842	NCP	%	89			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Oc0063842	NCP	%	67			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Oc0063842	NCP	%	70			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Oc0063842	NCP	%	86			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Oc0063842	NCP	%	87			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Oc0063842	NCP	%	84			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Oc0063842	NCP	%	85			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Oc0063842	NCP	%	76			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Oc0063842	NCP	%	80			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Oc0063842	NCP	%	79			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Oc0063842	NCP	%	65			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Oc0063842	NCP	%	76			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Oc0063842	NCP	%	68			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Oc0063842	NCP	%	60			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Oc0063842	NCP	%	87			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Oc0063842	NCP	%	76			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Oc0063842	NCP	%	70			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Oc0063842	NCP	%	60			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Oc0063842	NCP	%	78			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Oc0063842	NCP	%	77			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Oc0063842	NCP	%	71			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Oc0063842	NCP	%	73			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-Oc0066206	NCP	%	24	24	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Oc0063843	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Oc0063843	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Oc0063843	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Catherine Wilson	Analytical Services Manager
Joseph Edouard	Senior Analyst-PFAS



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Tyrone Gowans

From: Amy Meunier
Sent: Friday, 27 October 2023 11:28 AM
To: Ally Kirkman
Cc: GHD Lab Reports; Tom Duncan; #AU_CAU001_EnviroSampleVic
Subject: RE: Eurofins Test Results, Invoice - Report 1029914 : Site MFS PETERBOROUGH DSI (12616806)

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: ADDITIONALS

INFO: INTERNAL EMAIL - Sent from your own Eurofins email domain.

Hi Ally,

We will get this organised,

Tyrone – please see below, STD TAT

Kind regards,

Amy Meunier

Analytical Services Manager
Mobile : +61 477 574 867
Email : AmyMeunier@eurofins.com

Eurofins
6 Monterey Road,
Dandenong VIC 3175
Australia

#1038803

My office hours are 9am to 5:30pm (Monday to Friday)
If you require sample receipt outside these hours please email envirosamplevic@eurofins.com

eurofins Total Sulfur in Soils by LECO, NATA Accredited LEARN MORE

From: Ally Kirkman <ally.kirkman@ghd.com>
Sent: Friday, 27 October 2023 11:19 AM
To: Amy Meunier <AmyMeunier@eurofins.com>
Cc: GHD Lab Reports <GHDLabReports@ghd.com>; Tom Duncan <Thomas.Duncan@ghd.com>
Subject: RE: Eurofins Test Results, Invoice - Report 1029914 : Site MFS PETERBOROUGH DSI (12616806)

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Amy,

Please may we get the following sample also analysed for PFAS full-suite.

Job number: 12616806
Lab report number: 1029914
- FD05

Please also forward the following sample to ALS:
- FS05

Kind regards,
Ally

From: AmyMeunier@eurofins.com <AmyMeunier@eurofins.com>
Sent: Thursday, October 5, 2023 3:44 PM
To: Ally Kirkman <ally.kirkman@ghd.com>
Cc: GHD Lab Reports <GHDLabReports@ghd.com>; Tom Duncan <tom.duncan@ghd.com>
Subject: Eurofins Test Results, Invoice - Report 1029914 : Site MFS PETERBOROUGH DSI (12616806)

Hi Ally,

Please find attached results for your project in the subject header.

Kind regards,

Amy Meunier
Analytical Services Manager
Mobile : +61 477 574 867

Eurofins Environment Testing
6 Monterey Rd
Dandenong South VIC 3175
AUSTRALIA
Email : AmyMeunier@eurofins.com
Website : www.eurofins.com.au/environmental-testing
View our latest EnviroNotes



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www.eurofins.com.au EnviroSales@eurofins.com

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VIC 3175	VIC 3216	NSW 2145	ACT 2911	QLD 4172	Tel: +61 2 4968 8448
Tel: +61 3 8564 5000	Tel: +61 3 8564 5000	Tel: +61 2 9900 8400	Tel: +61 2 6113 8091	Tel: +61 7 3902 4600	NATA# 1261
NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Ally Kirkman
Project name:	MFS PETERBOROUGH DSI
Project ID:	12616806
Turnaround time:	5 Day
Date/Time received	Oct 27, 2023 11:28 AM
Eurofins reference	1038803

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
✓	Sample containers for volatile analysis received with zero headspace.
✓	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Amy Meunier on phone : or by email: AmyMeunier@eurofins.com

Results will be delivered electronically via email to Ally Kirkman - ally.kirkman@ghd.com.

Note: A copy of these results will also be delivered to the general GHD Pty Ltd SA email address.

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web: www.eurofins.com.au
email: EnviroSales@eurofins.com

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ABN: 50 005 085 521

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
Adelaide
SA 5001

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1038803
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Oct 27, 2023 11:28 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FD05	Oct 24, 2023		Soil	M23-Oc0065660	X	X
Test Counts						1	1

GHD Pty Ltd
GPO Box 2052
Adelaide
SA 5001

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration, inspection, proficiency testing scheme providers and reference materials producers reports and certificates.

Attention: **Ally Kirkman**

Report **1038803-S**
Project name MFS PETERBOROUGH DSI
Project ID 12616806
Received Date Oct 27, 2023

Client Sample ID			**FD05**
Sample Matrix			**Soil**
Eurofins Sample No.			**M23-Oc0065660**
Date Sampled			**Oct 24, 2023**
Test/Reference	LOR	Unit	
Sample Properties			
% Moisture	1	%	7.5
Perfluoroalkyl carboxylic acids (PFCAs)			
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5
13C4-PFBA (surr.)	1	%	87
13C5-PFPeA (surr.)	1	%	96
13C5-PFHxA (surr.)	1	%	91
13C4-PFHpA (surr.)	1	%	93
13C8-PFOA (surr.)	1	%	84
13C5-PFNA (surr.)	1	%	85
13C6-PFDA (surr.)	1	%	101
13C2-PFUnDA (surr.)	1	%	82
13C2-PFDoDA (surr.)	1	%	82
13C2-PFTeDA (surr.)	1	%	51
Perfluoroalkyl sulfonamido substances			
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10

Client Sample ID			FD05
Sample Matrix			Soil
Eurofins Sample No.			M23-Oc0065660
Date Sampled			Oct 24, 2023
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonamido substances			
13C8-FOSA (surr.)	1	%	73
D3-N-MeFOSA (surr.)	1	%	91
D5-N-EtFOSA (surr.)	1	%	85
D7-N-MeFOSE (surr.)	1	%	78
D9-N-EtFOSE (surr.)	1	%	78
D5-N-EtFOSAA (surr.)	1	%	74
D3-N-MeFOSAA (surr.)	1	%	85
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	[N09]16
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]19
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]320
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	[N09]18
13C3-PFBS (surr.)	1	%	91
18O2-PFHxS (surr.)	1	%	87
13C8-PFOS (surr.)	1	%	72
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5
13C2-4:2 FTSA (surr.)	1	%	79
13C2-6:2 FTSA (surr.)	1	%	64
13C2-8:2 FTSA (surr.)	1	%	73
13C2-10:2 FTSA (surr.)	1	%	77
PFASs Summations			
Sum (PFHxS + PFOS)*	5	ug/kg	339
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	320
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	339
Sum of WA DWER PFAS (n=10)*	10	ug/kg	339
Sum of PFASs (n=30)*	50	ug/kg	373

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Oct 27, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Oct 27, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Oct 27, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Oct 27, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Oct 27, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Oct 27, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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Site# 2370

Eurofins Environment Testing NZ Ltd
NZBN: 9429046024954

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Auckland 1061	Christchurch 7675	Tauranga 3112
Tel: +64 9 526 4551	Tel: +64 3 343 5201	Tel: +64 9 525 0568
IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
Adelaide
SA 5001

Project Name: MFS PETERBOROUGH DSI
Project ID: 12616806

Order No.:
Report #: 1038803
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Oct 27, 2023 11:28 AM
Due: Nov 3, 2023
Priority: 5 Day
Contact Name: Ally Kirkman

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	FD05	Oct 24, 2023		Soil	M23-Oc0065660	X	X
Test Counts						1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follow guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013. They are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry weight basis unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion unless otherwise stated.
4. For CEC results where the sample's origin is unknown or environmentally contaminated, the results should be used advisedly.
5. Actual LORs are matrix dependent. Quoted LORs may be raised where sample extracts are diluted due to interferences.
6. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
7. SVOC analysis on waters is performed on homogenised, unfiltered samples unless noted otherwise.
8. Samples were analysed on an 'as received' basis.
9. Information identified in this report with blue colour indicates data provided by customers that may have an impact on the results.
10. This report replaces any interim results previously issued.

Holding Times

Please refer to the 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours before sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and despite any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling; therefore, compliance with these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether, the holding time is 7 days; however, for all other VOCs, such as BTEX or C6-10 TRH, the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
µg/L: micrograms per litre
ppm: parts per million
ppb: parts per billion
%: Percentage
org/100 mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100 mL: Most Probable Number of organisms per 100 millilitres
CFU: Colony forming unit

Terms

APHA	American Public Health Association
CEC	Cation Exchange Capacity
COC	Chain of Custody
CP	Client Parent - QC was performed on samples pertaining to this report
CRM	Certified Reference Material (ISO17034) - reported as percent recovery.
Dry	Where moisture has been determined on a solid sample, the result is expressed on a dry weight basis.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
LOR	Limit of Reporting.
LCS	Laboratory Control Sample - reported as percent recovery.
Method Blank	In the case of solid samples, these are performed on laboratory-certified clean sands and in the case of water samples, these are performed on de-ionised water.
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC represents the sequence or batch that client samples were analysed within.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
SRA	Sample Receipt Advice
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
TBTO	Tributyltin oxide (*bis*-tributyltin oxide) - individual tributyltin compounds cannot be identified separately in the environment; however free tributyltin was measured, and its values were converted stoichiometrically into tributyltin oxide for comparison with regulatory limits.
TCLP	Toxicity Characteristic Leaching Procedure
TEQ	Toxic Equivalency Quotient or Total Equivalence
QSM	US Department of Defense Quality Systems Manual Version 5.4
US EPA	United States Environmental Protection Agency
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site-specific Sampling Analysis and Quality Plan (SAQP) have been implemented.

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30%; however the following acceptance guidelines are equally applicable: Results <10 times the LOR: No Limit

Results between 10-20 times the LOR: RPD must lie between 0-50%

Results >20 times the LOR: RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range, not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% for Speciated Phenols & 50-150% for PFAS. SVOCs recoveries 20 – 150%

PFAS field samples that contain surrogate recoveries above the QC limit designated in QSM 5.4, where no positive PFAS results have been reported, have been reviewed, and no data was affected.

QC Data General Comments

1. Where a result is reported as less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown are not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery, the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results, a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data; thus, it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	72			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	54			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	65			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	71			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	69			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	78			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	73			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	73			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	78			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	61			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	65			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	78			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	76			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	76			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	74			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	68			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	73			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	71			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	52			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	77			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	60			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	51			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	73			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	70			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	70			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	61			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	66			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	63			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	67			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	66			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Oc0063842	NCP	%	80			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Oc0063842	NCP	%	62			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Oc0063842	NCP	%	84			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Oc0063842	NCP	%	75			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Oc0063842	NCP	%	86			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Oc0063842	NCP	%	81			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Oc0063842	NCP	%	79			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Oc0063842	NCP	%	80			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Oc0063842	NCP	%	89			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Oc0063842	NCP	%	67			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Oc0063842	NCP	%	70			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Oc0063842	NCP	%	86			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Oc0063842	NCP	%	87			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Oc0063842	NCP	%	84			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Oc0063842	NCP	%	85			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Oc0063842	NCP	%	76			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Oc0063842	NCP	%	80			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Oc0063842	NCP	%	79			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Oc0063842	NCP	%	65			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Oc0063842	NCP	%	76			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Oc0063842	NCP	%	68			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Oc0063842	NCP	%	60			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Oc0063842	NCP	%	87			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Oc0063842	NCP	%	76			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Oc0063842	NCP	%	70			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Oc0063842	NCP	%	60			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Oc0063842	NCP	%	78			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Oc0063842	NCP	%	77			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Oc0063842	NCP	%	71			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Oc0063842	NCP	%	73			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-Oc0066206	NCP	%	24	24	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Oc0063843	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Oc0063843	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1	Result 2	RPD			
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Oc0063843	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Oc0063843	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N09	Quantification of linear and branched isomers has been conducted as a single total response using the relative response factor for the corresponding linear/branched standard.
N11	Isotope dilution is used for calibration of each native compound for which an exact labelled analogue is available (Isotope Dilution Quantitation). The isotopically labelled analogues allow identification and recovery correction of the concentration of the associated native PFAS compounds.
N15	Where the native PFAS compound does not have labelled analogue then the quantification is made using the Extracted Internal Standard Analyte with the closest retention time to the analyte and no recovery correction has been made (Internal Standard Quantitation).

Authorised by:

Catherine Wilson	Analytical Services Manager
Joseph Edouard	Senior Analyst-PFAS



Glenn Jackson
Managing Director

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CERTIFICATE OF ANALYSIS

Work Order	: **EM2317441**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Peter Ravlic
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12616806	Date Samples Received	: 28-Sep-2023 11:00
Order number	: ----	Date Analysis Commenced	: 06-Oct-2023
C-O-C number	: ----	Issue Date	: 10-Oct-2023 17:20
Sampler	: ----		
Site	:		
Quote number	: EN/000		
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*
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

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: Poor matrix spike recovery for sample EM2317440-002 due to sample matrix interference. Confirmed by re-analysis.
- EP231X: Poor duplicate precision observed for sample EM2317495-024 due to sample heterogeneity. Confirmed sample heterogeneity via re-analysis.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS03	FS04	FS06	FS08	----
				Sampling date / time	22-Sep-2023 00:00	23-Sep-2023 00:00	23-Sep-2023 00:00	24-Sep-2023 00:00	----
Compound	CAS Number	LOR	Unit		EM2317441-001	EM2317441-002	EM2317441-003	EM2317441-004	--------
					Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**10.6**	**12.8**	**11.1**	**7.8**	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		**0.0002**	**0.0037**	<0.0002	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		**0.0005**	**0.0045**	<0.0002	**0.0003**	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0075**	**0.0254**	**0.0014**	**0.0154**	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0012**	**0.0032**	**0.0006**	**0.0017**	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.619**	**0.0035**	**0.0796**	**0.270**	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0021**	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0005**	**0.0009**	<0.0002	<0.0002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0022**	**0.0067**	<0.0002	**0.0007**	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	**0.0006**	<0.0002	**0.0003**	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0005**	**0.0007**	<0.0002	**0.0015**	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0004**	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0020**	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS03	FS04	FS06	FS08	----
				Sampling date / time	22-Sep-2023 00:00	23-Sep-2023 00:00	23-Sep-2023 00:00	24-Sep-2023 00:00	----
Compound	CAS Number	LOR	Unit		EM2317441-001	EM2317441-002	EM2317441-003	EM2317441-004	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**0.0008**	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.632**	**0.0492**	**0.0816**	**0.296**	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.626**	**0.0289**	**0.0810**	**0.285**	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.630**	**0.0415**	**0.0810**	**0.289**	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**101**	**95.3**	**102**	**103**	----
13C8-PFOA	----	0.0002	%		**102**	**98.9**	**95.3**	**103**	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	68	136
13C8-PFOA	----	69	133

QUALITY CONTROL REPORT

Work Order	: **EM2317441**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Peter Ravlic
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12616806	Date Samples Received	: 28-Sep-2023
Order number	: ----	Date Analysis Commenced	: 06-Oct-2023
C-O-C number	: ----	Issue Date	: 10-Oct-2023
Sampler	: ----		
Site	:		
Quote number	: EN/000		
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*
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

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: 5343498)									
EM2317441-001	FS03	EA055: Moisture Content	----	0.1	%	10.6	11.2	6.3	0% - 20%
EM2317650-004	Anonymous	EA055: Moisture Content	----	0.1	%	7.5	7.4	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5342786)									
EM2317440-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.110	0.0936	16.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0914	0.0855	6.7	0% - 20%
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.384	0.391	1.7	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0298	0.0302	1.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	1.62	1.79	10.1	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0004	<0.0004	0.0	No Limit
EM2317495-024	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0049	0.0056	12.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0048	0.0051	5.5	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.108	0.114	5.5	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0248	0.0340	31.4	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	88.0	# 129	38.1	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.633	0.887	33.3	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5342786)									
EM2317440-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0524	0.0432	19.2	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.237	0.194	19.7	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0178	0.0163	8.7	0% - 20%
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0258	0.0247	4.6	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0506	0.0501	1.0	0% - 20%
		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	0.0013	0.0015	16.2	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: 5342786) - continued									
EM2317440-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	0.024	0.020	18.7	0% - 20%
EM2317495-024	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0082	0.0090	10.2	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0239	0.0251	4.8	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0136	0.0146	6.8	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0351	0.0403	13.8	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0404	0.0666	49.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.648	# 0.868	29.1	0% - 20%
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.732	# 1.01	31.9	0% - 20%
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.466	# 0.624	29.0	0% - 20%
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	0.205	# 0.267	26.1	0% - 20%
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	0.0940	0.124	27.3	0% - 50%
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.017	<0.018	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5342786)									
EM2317440-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0003	0.0003	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
EM2317495-024	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	1.24	# 1.82	38.1	0% - 20%
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	0.0210	0.0313	39.3	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0035	0.0036	4.5	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	0.0152	0.0228	40.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0086	<0.0090	3.7	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0086	<0.0090	3.7	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0086	<0.0090	3.7	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: 5342786)									
EM2317440-001	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	0.0031	0.0029	7.4	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
EM2317495-024	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0035	<0.0036	3.7	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0035	<0.0036	3.7	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	6.70	# 10.8	47.0	0% - 20%
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	0.300	# 0.415	32.2	0% - 20%
EP231P: PFAS Sums (QC Lot: 5342786)									
EM2317440-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	2.65	2.74	3.6	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	2.00	2.18	8.5	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	2.47	2.58	4.0	0% - 20%
EM2317495-024	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	99.3	# 146	38.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	88.1	# 129	37.8	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	94.9	# 140	38.4	0% - 20%

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5342786)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	88.8	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	97.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	97.9	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	107	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	97.7	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	91.6	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5342786)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	84.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.2	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	86.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5342786)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.6	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.8	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.3	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	84.0	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5342786)								

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: 5342786) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	93.5	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	92.9	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	94.7	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	99.6	70.0	130
EP231P: PFAS Sums (QCLot: 5342786)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5342786)							
EM2317440-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	83.6	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	90.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	95.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	97.9	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	# Not Determined	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5342786)							
EM2317440-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	84.0	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	90.5	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	97.5	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	97.7	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	93.3	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	89.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	87.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	88.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	74.5	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	131	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	87.3	69.0	133

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: 5342786)							
EM2317440-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	87.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	100	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	93.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	88.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	86.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	88.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	94.5	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5342786)							
EM2317440-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	94.1	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	90.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	78.0	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	# 31.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2317441**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Telephone	: +6138549 9645
Project	: 12616806	Date Samples Received	: 28-Sep-2023
Site	:	Issue Date	: 10-Oct-2023
Sampler	: ----	No. of samples received	: 4
Order number	: ----	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 Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP231A: Perfluoroalkyl Sulfonic Acids	EM2317495--024	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	38.1 %	0% - 20%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2317495--024	Anonymous	**Perfluorodecanoic acid (PFDA)**	335-76-2	29.1 %	0% - 20%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2317495--024	Anonymous	**Perfluoroundecanoic acid (PFUnDA)**	2058-94-8	31.9 %	0% - 20%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2317495--024	Anonymous	**Perfluorododecanoic acid (PFDoDA)**	307-55-1	29.0 %	0% - 20%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2317495--024	Anonymous	**Perfluorotridecanoic acid (PFTrDA)**	72629-94-8	26.1 %	0% - 20%	**RPD exceeds LOR based limits**
EP231C: Perfluoroalkyl Sulfonamides	EM2317495--024	Anonymous	**Perfluorooctane sulfonamide (FOSA)**	754-91-6	38.1 %	0% - 20%	**RPD exceeds LOR based limits**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2317495--024	Anonymous	**8:2 Fluorotelomer sulfonic acid (8:2 FTS)**	39108-34-4	47.0 %	0% - 20%	**RPD exceeds LOR based limits**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2317495--024	Anonymous	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	32.2 %	0% - 20%	**RPD exceeds LOR based limits**
EP231P: PFAS Sums	EM2317495--024	Anonymous	**Sum of PFAS**	----	38.2 %	0% - 20%	**RPD exceeds LOR based limits**
EP231P: PFAS Sums	EM2317495--024	Anonymous	**Sum of PFHxS and PFOS**	355-46-4/1763-23-1	37.8 %	0% - 20%	**RPD exceeds LOR based limits**
EP231P: PFAS Sums	EM2317495--024	Anonymous	**Sum of PFAS (WA DER List)**	----	38.4 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EM2317440--002	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EM2317440--002	Anonymous	**Perfluorodecane sulfonic acid (PFDS)**	335-77-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2317440--002	Anonymous	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	31.1 %	70.0-130%	**Recovery less than lower data quality objective**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **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) FS03	**22-Sep-2023**	**----**	----	**----**	**06-Oct-2023**	06-Oct-2023	✓
HDPE Soil Jar (EA055) FS04, FS06	**23-Sep-2023**	**----**	----	**----**	**06-Oct-2023**	07-Oct-2023	✓
HDPE Soil Jar (EA055) FS08	**24-Sep-2023**	**----**	----	**----**	**06-Oct-2023**	08-Oct-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) FS03	**22-Sep-2023**	**06-Oct-2023**	20-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS04, FS06	**23-Sep-2023**	**06-Oct-2023**	21-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS08	**24-Sep-2023**	**06-Oct-2023**	22-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) FS03	**22-Sep-2023**	**06-Oct-2023**	20-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS04, FS06	**23-Sep-2023**	**06-Oct-2023**	21-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS08	**24-Sep-2023**	**06-Oct-2023**	22-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) FS03	**22-Sep-2023**	**06-Oct-2023**	20-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS04, FS06	**23-Sep-2023**	**06-Oct-2023**	21-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS08	**24-Sep-2023**	**06-Oct-2023**	22-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) FS03	**22-Sep-2023**	**06-Oct-2023**	20-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS04, FS06	**23-Sep-2023**	**06-Oct-2023**	21-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS08	**24-Sep-2023**	**06-Oct-2023**	22-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) FS03	**22-Sep-2023**	**06-Oct-2023**	20-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS04, FS06	**23-Sep-2023**	**06-Oct-2023**	21-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS08	**24-Sep-2023**	**06-Oct-2023**	22-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**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 : **EM2317441**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Peter Ravlic
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: tom.duncan@ghd.com	E-mail	: peter.ravlic@alsglobal.com
Telephone	: ----	Telephone	: +6138549 9645
Facsimile	: ----	Facsimile	: +61-3-8549 9626
Project	: 12616806	Page	: 1 of 2
Order number	: ----	Quote number	: EB2020GHDSER0038 (EN/000)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	:		

Dates

Date Samples Received	: 28-Sep-2023 11:00	Issue Date	: 04-Oct-2023
Client Requested Due Date	: 11-Oct-2023	Scheduled Reporting Date	: **11-Oct-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.5°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EM2317441-001	22-Sep-2023 00:00	FS03	✓	✓
EM2317441-002	23-Sep-2023 00:00	FS04	✓	✓
EM2317441-003	23-Sep-2023 00:00	FS06	✓	✓
EM2317441-004	24-Sep-2023 00:00	FS08	✓	✓

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	accountspayableAU@ghd.com
ALLY KIRKMAN		
- *AU Certificate of Analysis - NATA (COA)	Email	ally.kirkman@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ally.kirkman@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ally.kirkman@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ally.kirkman@ghd.com
- Chain of Custody (CoC) (COC)	Email	ally.kirkman@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ally.kirkman@ghd.com
- EDI Format - XTab (XTAB)	Email	ally.kirkman@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ally.kirkman@ghd.com
GHD LAB REPORTS		
- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com
TOM DUNCAN		
- *AU Certificate of Analysis - NATA (COA)	Email	tom.duncan@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	tom.duncan@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	tom.duncan@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	tom.duncan@ghd.com
- A4 - AU Tax Invoice (INV)	Email	tom.duncan@ghd.com
- Chain of Custody (CoC) (COC)	Email	tom.duncan@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	tom.duncan@ghd.com
- EDI Format - XTab (XTAB)	Email	tom.duncan@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	tom.duncan@ghd.com

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COPY

Environmental Division
Melbourne
Work Order Reference
EM2317441

Telephone : +61-3-8549 9600

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address
Level 4 - 211 Victoria Square, Adelaide SA 5000
Telephone: (08) 8111 6600

Completion Date / Turnaround
STANDARD

Quote #
Quote GHD STANDARD RATES

Project Number
12616806
Project Name
MFS Peterborough DSI
GHD Project Manager
Tom Duncan
GHD Contact
Ally Kirkman
GHD PM email
Tom.Duncan@ghd.com
GHD Contact email
Ally.Kirkman@ghd.com

Laboratory
Eurofins Environmental
Laboratory Address
9 Main Terrace, Richmond SA 5033
Laboratory Contact
Parimal Acharya

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on receipt and release of samples, between each party.
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and ESDAT format.

	Sample I.D.	Date and Time	Composite Samples	Sample Matrix (E.g. Soil, W, Drum Water, Air, Other)	Preservative	Containers: Type (J, Jar; B, Bag; V, Vial; G, glass bottle; P, plastic bottle)	Containers: Number	Containers: Volume (ml)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ALS	SAMPLE COMMENTS
	MW03_2.0	23-Sep-23		Soil	Ice	J	1			X		
	MW03_2.5	23-Sep-23		Soil	Ice	J	1			X		
	MW03_3.0	23-Sep-23		Soil	Ice	J	1		X			
	MW03_3.5	23-Sep-23		Soil	Ice	J	1			X		
	MW03_14.0	23-Sep-23		Soil	Ice	J	1			X		
	FD01	22-Sep-23		Soil	Ice	J	1			X		
	FS01	22-Sep-23		Soil	Ice	J	1			X		
	FD02	22-Sep-23		Soil	Ice	J	1			X		
	FS02	22-Sep-23		Soil	Ice	J	1			X		
	FD03	22-Sep-23		Soil	Ice	J	1		X			
1	FS03	22-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
	FD04	23-Sep-23		Soil	Ice	J	1		X			
2	FS04	23-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
	FD05	23-Sep-23		Soil	Ice	J	1			X		
	FS05	23-Sep-23		Soil	Ice	J	1			X		
	FD06	23-Sep-23		Soil	Ice	J	1		X			
3	FS06	23-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
	FD07	24-Sep-23		Soil	Ice	J	1			X		
	FS07	24-Sep-23		Soil	Ice	J	1			X		
	FD08	24-Sep-23		Soil	Ice	P	1		X			
4	FS08	24-Sep-23		Soil	Ice	P	1				X	Please forward to ALS for analysis
	FB01	22-Sep-23		Water	Ice	P	1		X			
	RB01	22-Sep-23		Water	Ice	P	1		X			
	RB02	23-Sep-23		Water	Ice	P	1		X			
	RB03	24-Sep-23		Water	Ice	P	1		X			
	TOTAL NUMBER OF SAMPLES	113										
	TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS
SAMPLER

GHD SERVICE CENTRE	Date/Time	Relinquished by:		Date/Time
Received by: TD	Date/Time 28/9 11:00	Relinquished by:		Date/Time
COURIER				

Jessica-S EG 28/9/23 8am

12 EG

COPY

Environmental Division
Melbourne
Work Order Reference
EM2317441

Telephone : +61-3-8549 9600

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address
Level 4 - 211 Victoria Square, Adelaide SA 5000
Telephone: (08) 8111 6600

Completion Date / Turnaround
STANDARD

Quote #
Quote GHD STANDARD RATES

Project Number
12616806

Project Name
MFS Peterborough DSI

GHD Project Manager
Tom Duncan

GHD Contact
Ally Kirkman

GHD PM email
Tom.Duncan@ghd.com

GHD Contact email
Ally.Kirkman@ghd.com

Laboratory
Eurofins Environmental

Laboratory Address
9 Main Terrace, Richmond SA 5033

Laboratory Contact
Parimal Acharya

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on receipt and release of samples, between each party
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt.
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and ESDAT format.

	Sample I.D.	Date and Time	Composite Samples	Sample Matrix (Soil, Air, Drill Cuttings, Water, Dust, Other)	Preservative	Containers: Type (Jar, Ziplag, Vial, Other glass bottle, Plastic bottle)	Containers: Number	Containers: Volume (mL)	Analyses Required: PFAS Full 30 Analyte Suite	HOLD	SEND TO ALS	SAMPLE COMMENTS
	MW03_2.0	23-Sep-23		Soil	Ice	J	1			X		
	MW03_2.5	23-Sep-23		Soil	Ice	J	1			X		
	MW03_3.0	23-Sep-23		Soil	Ice	J	1		X			
	MW03_3.5	23-Sep-23		Soil	Ice	J	1			X		
	MW03_14.0	23-Sep-23		Soil	Ice	J	1			X		
	FD01	22-Sep-23		Soil	Ice	J	1			X		
	FS01	22-Sep-23		Soil	Ice	J	1			X		
	FD02	22-Sep-23		Soil	Ice	J	1			X		
	FS02	22-Sep-23		Soil	Ice	J	1			X		
	FD03	22-Sep-23		Soil	Ice	J	1		X			
1	FS03	22-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
	FD04	23-Sep-23		Soil	Ice	J	1		X			
2	FS04	23-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
	FD05	23-Sep-23		Soil	Ice	J	1			X		
	FS05	23-Sep-23		Soil	Ice	J	1			X		
	FD06	23-Sep-23		Soil	Ice	J	1		X			
3	FS06	23-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
	FD07	24-Sep-23		Soil	Ice	J	1			X		
	FS07	24-Sep-23		Soil	Ice	J	1			X		
	FD08	24-Sep-23		Soil	Ice	P	1		X			
4	FS08	24-Sep-23		Soil	Ice	P	1				X	Please forward to ALS for analysis
	FB01	22-Sep-23		Water	Ice	P	1		X			
	RB01	22-Sep-23		Water	Ice	P	1		X			
	RB02	23-Sep-23		Water	Ice	P	1		X			
	RB03	24-Sep-23		Water	Ice	P	1		X			
	TOTAL NUMBER OF SAMPLES	113										
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CUSTODY DETAILS

SAMPLER

GHD SERVICE CENTRE	Date/Time	Relinquished by:		Date/Time
Received by: TD	Date/Time 28/9 11:00	Relinquished by:		Date/Time
COURIER				

Jessica-S EG 28/9/23 8am

Ranil Weerakkody

From: Peter Ravlic
Sent: Wednesday, 4 October 2023 10:10 AM
To: COC Melbourne
Subject: EM2317441 - GHDSER - 12616806
Attachments: [EXTERNAL] - RE: EM2317441 - GHDSER - 12616806

Team, attached analysis confirmation for hold samples

Kind Regards

Peter Ravlic
Client Services
ALS Limited

Ph: +61 3 8549 9600
peter.ravlic@alsglobal.com

2-4 Westall Road, Springvale VIC 3171

alsglobal.com

From: Tom Duncan <Thomas.Duncan@ghd.com>
Sent: Wednesday, 4 October 2023 10:08 AM
To: Peter Ravlic <peter.ravlic@alsglobal.com>
Cc: Ally Kirkman <Ally.Kirkman@ghd.com>
Subject: [EXTERNAL] - RE: EM2317441 - GHDSER - 12616806

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Hi Peter, these ones will be for the PFAS full suite.

Thanks

Tom Duncan (he/him)
B. Engineering (Environmental) (Hons)
Senior Environmental Engineer

GHD
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Level 9, 180 Lonsdale Street, Melbourne, VIC 3000
D 61 0 8687 8327 **M** 61 413 476 581 **E** Tom.Duncan@ghd.com

→ The Power of Commitment
Connect

Please consider the environment before printing this email

From: Peter Ravlic <peter.ravlic@alsglobal.com>
Sent: Tuesday, October 3, 2023 6:03 PM
To: Tom Duncan <Thomas.Duncan@ghd.com>
Subject: EM2317441 - GHDSER - 12616806

Hi Tom

Can you please confirm analysis for above hold samples

Thanks

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right solutions.
right partner.

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COPY

Environmental Division
Melbourne
Work Order Reference
EM2317441

Telephone : +61-3-8549 9600

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	FD02	22-Sep-23		Soil	Ice	J	1			X		
	FS02	22-Sep-23		Soil	Ice	J	1			X		
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CUSTODY DETAILS

SAMPLER

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SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM2317441**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Peter Ravlic
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: tom.duncan@ghd.com	E-mail	: peter.ravlic@alsglobal.com
Telephone	: ----	Telephone	: +6138549 9645
Facsimile	: ----	Facsimile	: +61-3-8549 9626
Project	: 12616806	Page	: 1 of 2
Order number	: ----	Quote number	: EB2020GHDSER0038 (EN/000)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	:		

Dates

Date Samples Received	: 28-Sep-2023 11:00	Issue Date	: 04-Oct-2023
Client Requested Due Date	: 11-Oct-2023	Scheduled Reporting Date	: **11-Oct-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 6.5°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 4 / 4

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EM2317441-001	22-Sep-2023 00:00	FS03	✓	✓
EM2317441-002	23-Sep-2023 00:00	FS04	✓	✓
EM2317441-003	23-Sep-2023 00:00	FS06	✓	✓
EM2317441-004	24-Sep-2023 00:00	FS08	✓	✓

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	accountspayableAU@ghd.com
ALLY KIRKMAN		
- *AU Certificate of Analysis - NATA (COA)	Email	ally.kirkman@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ally.kirkman@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ally.kirkman@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ally.kirkman@ghd.com
- Chain of Custody (CoC) (COC)	Email	ally.kirkman@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ally.kirkman@ghd.com
- EDI Format - XTab (XTAB)	Email	ally.kirkman@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ally.kirkman@ghd.com
GHD LAB REPORTS		
- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com
TOM DUNCAN		
- *AU Certificate of Analysis - NATA (COA)	Email	tom.duncan@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	tom.duncan@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	tom.duncan@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	tom.duncan@ghd.com
- A4 - AU Tax Invoice (INV)	Email	tom.duncan@ghd.com
- Chain of Custody (CoC) (COC)	Email	tom.duncan@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	tom.duncan@ghd.com
- EDI Format - XTab (XTAB)	Email	tom.duncan@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	tom.duncan@ghd.com

QUALITY CONTROL REPORT

Work Order	: **EM2317441**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Peter Ravlic
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12616806	Date Samples Received	: 28-Sep-2023
Order number	: ----	Date Analysis Commenced	: 06-Oct-2023
C-O-C number	: ----	Issue Date	: 10-Oct-2023
Sampler	: ----		
Site	:		
Quote number	: EN/000		
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*
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

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: 5343498)									
EM2317441-001	FS03	EA055: Moisture Content	----	0.1	%	10.6	11.2	6.3	0% - 20%
EM2317650-004	Anonymous	EA055: Moisture Content	----	0.1	%	7.5	7.4	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5342786)									
EM2317440-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.110	0.0936	16.6	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0914	0.0855	6.7	0% - 20%
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.384	0.391	1.7	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0298	0.0302	1.0	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	1.62	1.79	10.1	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0004	<0.0004	0.0	No Limit
EM2317495-024	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0049	0.0056	12.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0048	0.0051	5.5	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.108	0.114	5.5	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0248	0.0340	31.4	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	88.0	# 129	38.1	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.633	0.887	33.3	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5342786)									
EM2317440-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0524	0.0432	19.2	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.237	0.194	19.7	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0178	0.0163	8.7	0% - 20%
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0258	0.0247	4.6	0% - 20%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0506	0.0501	1.0	0% - 20%
		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	0.0013	0.0015	16.2	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: 5342786) - continued									
EM2317440-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	0.024	0.020	18.7	0% - 20%
EM2317495-024	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0082	0.0090	10.2	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0239	0.0251	4.8	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0136	0.0146	6.8	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0351	0.0403	13.8	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0404	0.0666	49.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.648	# 0.868	29.1	0% - 20%
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.732	# 1.01	31.9	0% - 20%
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.466	# 0.624	29.0	0% - 20%
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	0.205	# 0.267	26.1	0% - 20%
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	0.0940	0.124	27.3	0% - 50%
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.017	<0.018	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5342786)									
EM2317440-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0003	0.0003	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
EM2317495-024	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	1.24	# 1.82	38.1	0% - 20%
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	0.0210	0.0313	39.3	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0035	0.0036	4.5	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	0.0152	0.0228	40.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0086	<0.0090	3.7	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0086	<0.0090	3.7	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0086	<0.0090	3.7	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: 5342786)									
EM2317440-001	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	0.0031	0.0029	7.4	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
EM2317495-024	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0035	<0.0036	3.7	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0035	<0.0036	3.7	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	6.70	# 10.8	47.0	0% - 20%
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	0.300	# 0.415	32.2	0% - 20%
EP231P: PFAS Sums (QC Lot: 5342786)									
EM2317440-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	2.65	2.74	3.6	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	2.00	2.18	8.5	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	2.47	2.58	4.0	0% - 20%
EM2317495-024	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	99.3	# 146	38.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	88.1	# 129	37.8	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	94.9	# 140	38.4	0% - 20%

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5342786)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	88.8	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	97.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	97.9	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	107	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	97.7	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	91.6	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5342786)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	84.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.8	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.8	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	85.4	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.2	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.0	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	86.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5342786)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	89.6	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.8	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.3	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	84.0	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.0	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5342786)								

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: 5342786) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	93.5	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	92.9	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	94.7	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	99.6	70.0	130
EP231P: PFAS Sums (QCLot: 5342786)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5342786)							
EM2317440-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	83.6	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	90.2	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	95.4	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	97.9	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	# Not Determined	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5342786)							
EM2317440-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	84.0	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	90.5	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	97.5	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	97.7	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	93.3	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	89.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	87.2	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	88.0	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	74.5	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	131	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	87.3	69.0	133

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: 5342786)							
EM2317440-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	87.2	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	100	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	93.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	88.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	86.4	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	88.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	94.5	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5342786)							
EM2317440-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	94.1	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	90.7	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	78.0	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	# 31.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2317441**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Telephone	: +6138549 9645
Project	: 12616806	Date Samples Received	: 28-Sep-2023
Site	:	Issue Date	: 10-Oct-2023
Sampler	: ----	No. of samples received	: 4
Order number	: ----	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 Laboratory Control outliers occur.**
- **Duplicate outliers exist - please see following pages for full details.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Duplicate (DUP) RPDs							
EP231A: Perfluoroalkyl Sulfonic Acids	EM2317495--024	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	38.1 %	0% - 20%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2317495--024	Anonymous	**Perfluorodecanoic acid (PFDA)**	335-76-2	29.1 %	0% - 20%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2317495--024	Anonymous	**Perfluoroundecanoic acid (PFUnDA)**	2058-94-8	31.9 %	0% - 20%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2317495--024	Anonymous	**Perfluorododecanoic acid (PFDoDA)**	307-55-1	29.0 %	0% - 20%	**RPD exceeds LOR based limits**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2317495--024	Anonymous	**Perfluorotridecanoic acid (PFTrDA)**	72629-94-8	26.1 %	0% - 20%	**RPD exceeds LOR based limits**
EP231C: Perfluoroalkyl Sulfonamides	EM2317495--024	Anonymous	**Perfluorooctane sulfonamide (FOSA)**	754-91-6	38.1 %	0% - 20%	**RPD exceeds LOR based limits**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2317495--024	Anonymous	**8:2 Fluorotelomer sulfonic acid (8:2 FTS)**	39108-34-4	47.0 %	0% - 20%	**RPD exceeds LOR based limits**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2317495--024	Anonymous	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	32.2 %	0% - 20%	**RPD exceeds LOR based limits**
EP231P: PFAS Sums	EM2317495--024	Anonymous	**Sum of PFAS**	----	38.2 %	0% - 20%	**RPD exceeds LOR based limits**
EP231P: PFAS Sums	EM2317495--024	Anonymous	**Sum of PFHxS and PFOS**	355-46-4/1763-23-1	37.8 %	0% - 20%	**RPD exceeds LOR based limits**
EP231P: PFAS Sums	EM2317495--024	Anonymous	**Sum of PFAS (WA DER List)**	----	38.4 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EM2317440--002	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EM2317440--002	Anonymous	**Perfluorodecane sulfonic acid (PFDS)**	335-77-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2317440--002	Anonymous	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	31.1 %	70.0-130%	**Recovery less than lower data quality objective**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **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) FS03	**22-Sep-2023**	**----**	----	**----**	**06-Oct-2023**	06-Oct-2023	✓
HDPE Soil Jar (EA055) FS04, FS06	**23-Sep-2023**	**----**	----	**----**	**06-Oct-2023**	07-Oct-2023	✓
HDPE Soil Jar (EA055) FS08	**24-Sep-2023**	**----**	----	**----**	**06-Oct-2023**	08-Oct-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) FS03	**22-Sep-2023**	**06-Oct-2023**	20-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS04, FS06	**23-Sep-2023**	**06-Oct-2023**	21-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS08	**24-Sep-2023**	**06-Oct-2023**	22-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) FS03	**22-Sep-2023**	**06-Oct-2023**	20-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS04, FS06	**23-Sep-2023**	**06-Oct-2023**	21-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS08	**24-Sep-2023**	**06-Oct-2023**	22-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) FS03	**22-Sep-2023**	**06-Oct-2023**	20-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS04, FS06	**23-Sep-2023**	**06-Oct-2023**	21-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS08	**24-Sep-2023**	**06-Oct-2023**	22-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) FS03	**22-Sep-2023**	**06-Oct-2023**	20-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS04, FS06	**23-Sep-2023**	**06-Oct-2023**	21-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS08	**24-Sep-2023**	**06-Oct-2023**	22-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) FS03	**22-Sep-2023**	**06-Oct-2023**	20-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS04, FS06	**23-Sep-2023**	**06-Oct-2023**	21-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓
HDPE Soil Jar (EP231X) FS08	**24-Sep-2023**	**06-Oct-2023**	22-Mar-2024	✓	**10-Oct-2023**	15-Nov-2023	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	13	**15.38**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**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.

CERTIFICATE OF ANALYSIS

Work Order	: **EM2317441**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Peter Ravlic
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12616806	Date Samples Received	: 28-Sep-2023 11:00
Order number	: ----	Date Analysis Commenced	: 06-Oct-2023
C-O-C number	: ----	Issue Date	: 10-Oct-2023 17:20
Sampler	: ----		
Site	:		
Quote number	: EN/000		
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*
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

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: Poor matrix spike recovery for sample EM2317440-002 due to sample matrix interference. Confirmed by re-analysis.
- EP231X: Poor duplicate precision observed for sample EM2317495-024 due to sample heterogeneity. Confirmed sample heterogeneity via re-analysis.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS03	FS04	FS06	FS08	----
				Sampling date / time	22-Sep-2023 00:00	23-Sep-2023 00:00	23-Sep-2023 00:00	24-Sep-2023 00:00	----
Compound	CAS Number	LOR	Unit		EM2317441-001	EM2317441-002	EM2317441-003	EM2317441-004	--------
					Result	Result	Result	Result	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**10.6**	**12.8**	**11.1**	**7.8**	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		**0.0002**	**0.0037**	<0.0002	<0.0002	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		**0.0005**	**0.0045**	<0.0002	**0.0003**	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0075**	**0.0254**	**0.0014**	**0.0154**	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0012**	**0.0032**	**0.0006**	**0.0017**	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.619**	**0.0035**	**0.0796**	**0.270**	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0021**	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0005**	**0.0009**	<0.0002	<0.0002	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0022**	**0.0067**	<0.0002	**0.0007**	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	**0.0006**	<0.0002	**0.0003**	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0005**	**0.0007**	<0.0002	**0.0015**	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0004**	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0003**	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	**0.0020**	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS03	FS04	FS06	FS08	----
				Sampling date / time	22-Sep-2023 00:00	23-Sep-2023 00:00	23-Sep-2023 00:00	24-Sep-2023 00:00	----
Compound	CAS Number	LOR	Unit		EM2317441-001	EM2317441-002	EM2317441-003	EM2317441-004	--------
					Result	Result	Result	Result	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	**0.0008**	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.632**	**0.0492**	**0.0816**	**0.296**	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.626**	**0.0289**	**0.0810**	**0.285**	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.630**	**0.0415**	**0.0810**	**0.289**	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**101**	**95.3**	**102**	**103**	----
13C8-PFOA	----	0.0002	%		**102**	**98.9**	**95.3**	**103**	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	68	136
13C8-PFOA	----	69	133

CERTIFICATE OF ANALYSIS

Work Order	: **EM2319399**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Peter Ravlic
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12616806	Date Samples Received	: 30-Oct-2023 11:05
Order number	: ----	Date Analysis Commenced	: 30-Oct-2023
C-O-C number	: ----	Issue Date	: 06-Nov-2023 12:39
Sampler	: ----		
Site	:		
Quote number	: EN/000		
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*
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

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

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

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

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

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

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

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

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS05	----	----	----	----
				Sampling date / time	23-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2319399-001	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**45.3**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		**0.0021**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		**0.0019**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0158**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0014**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.299**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		**0.0213**	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		**0.003**	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0018**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0019**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0008**	----	----	----	----
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		**0.0004**	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		**0.0002**	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		**0.0009**	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS05	----	----	----	----
				Sampling date / time	23-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2319399-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
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		**0.351**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.315**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.324**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**106**	----	----	----	----
13C8-PFOA	----	0.0002	%		**98.5**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	68	136
13C8-PFOA	----	69	133

QUALITY CONTROL REPORT

Work Order	: **EM2319399**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Peter Ravlic
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12616806	Date Samples Received	: 30-Oct-2023
Order number	: ----	Date Analysis Commenced	: 30-Oct-2023
C-O-C number	: ----	Issue Date	: 06-Nov-2023
Sampler	: ----		
Site	:		
Quote number	: EN/000		
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*
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

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: 5393110)									
EM2319399-001	FS05	EA055: Moisture Content	----	0.1	%	45.3	47.1	4.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5399192)									
EM2319393-001	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
EM2319416-032	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: 5399192)									
EM2319393-001	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

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: 5399192) - continued									
EM2319393-001	Anonymous	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
EM2319416-032	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5399192)									
EM2319393-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2319416-032	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5399192)									

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: 5399192) - continued									
EM2319393-001	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
EM2319416-032	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5399192)									
EM2319393-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2319416-032	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	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: 5399192)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	86.4	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	100	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	93.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	93.0	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	86.5	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	78.1	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5399192)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.1	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.1	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.7	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.4	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.9	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.3	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.0	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.0	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5399192)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	86.8	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.3	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.5	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.1	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5399192)								

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: 5399192) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	91.7	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	95.2	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	98.7	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	101	70.0	130
EP231P: PFAS Sums (QCLot: 5399192)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5399192)							
EM2319393-013	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	88.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	99.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	92.5	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	101	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	73.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	73.6	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5399192)							
EM2319393-013	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	84.1	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	89.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	92.3	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	88.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	94.5	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	95.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	97.9	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.7	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	88.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	87.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	99.8	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5399192)							

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: 5399192) - continued							
EM2319393-013	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	96.5	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	86.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	85.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	99.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	90.7	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	61.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5399192)							
EM2319393-013	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	0.00119 mg/kg	96.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	98.5	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	91.0	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2319399**	Page	: 1 of 4
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Telephone	: +6138549 9645
Project	: 12616806	Date Samples Received	: 30-Oct-2023
Site	:	Issue Date	: 06-Nov-2023
Sampler	: ----	No. of samples received	: 1
Order number	: ----	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

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA055: Moisture Content (Dried @ 105-110°C)						
HDPE Soil Jar						
FS05	----	----	----	30-Oct-2023	07-Oct-2023	**23**

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)							
FS05	**23-Sep-2023**	**----**	----	**----**	**30-Oct-2023**	07-Oct-2023	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
FS05	**23-Sep-2023**	**02-Nov-2023**	21-Mar-2024	✓	**03-Nov-2023**	12-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
FS05	**23-Sep-2023**	**02-Nov-2023**	21-Mar-2024	✓	**03-Nov-2023**	12-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
FS05	**23-Sep-2023**	**02-Nov-2023**	21-Mar-2024	✓	**03-Nov-2023**	12-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
FS05	**23-Sep-2023**	**02-Nov-2023**	21-Mar-2024	✓	**03-Nov-2023**	12-Dec-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
FS05	**23-Sep-2023**	**02-Nov-2023**	21-Mar-2024	✓	**03-Nov-2023**	12-Dec-2023	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **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	1	**100.00**	**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 : **EM2319399**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Peter Ravlic
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: tom.duncan@ghd.com	E-mail	: peter.ravlic@alsglobal.com
Telephone	: ----	Telephone	: +6138549 9645
Facsimile	: ----	Facsimile	: +61-3-8549 9626
Project	: 12616806	Page	: 1 of 3
Order number	: ----	Quote number	: EB2020GHDSER0038 (EN/000)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	:		

Dates

Date Samples Received	: 30-Oct-2023 11:05	Issue Date	: 30-Oct-2023
Client Requested Due Date	: 06-Nov-2023	Scheduled Reporting Date	: **06-Nov-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.6°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EM2319399-001	23-Sep-2023 00:00	FS05	✓	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

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

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EA055: Moisture Content							
FS05	HDPE Soil Jar	----	07-Oct-2023	30-Oct-2023	×	----	----

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

Accounts Payable Australia

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

ALLY KIRKMAN

- *AU Certificate of Analysis - NATA (COA)	Email	ally.kirkman@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ally.kirkman@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ally.kirkman@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ally.kirkman@ghd.com
- Chain of Custody (CoC) (COC)	Email	ally.kirkman@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ally.kirkman@ghd.com
- EDI Format - XTab (XTAB)	Email	ally.kirkman@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ally.kirkman@ghd.com

GHD LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com

TOM DUNCAN

- *AU Certificate of Analysis - NATA (COA)	Email	tom.duncan@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	tom.duncan@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	tom.duncan@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	tom.duncan@ghd.com
- A4 - AU Tax Invoice (INV)	Email	tom.duncan@ghd.com
- Chain of Custody (CoC) (COC)	Email	tom.duncan@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	tom.duncan@ghd.com
- EDI Format - XTab (XTAB)	Email	tom.duncan@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	tom.duncan@ghd.com

(4)

Environmental Division
Melbourne
Work Order Reference
EM2319399

Telephone : + 61-3-8549 9600

GHD

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address	Completion Date / Turnaround	Quote #
Level 4 - 211 Victoria Square, Adelaide SA 5000 Telephone: (08) 8111 5800	STANDARD	Quote GHD STANDARD RATES

Project Number	12519606
Project Name	MFB Peterborough DG
GHD Project Manager	Tom Duncan
GHD Contact	Ally Kinkman
GHD PM email	Tom.Duncan@ghd.com
GHD Contact email	Ally.Kinkman@ghd.com
Laboratory	Eurofins Environmental
Laboratory Address	6 Main Terrace, Richmond SA 5033
Laboratory Contact	Parmal Acharya

COURIER AND LABORATORY INSTRUCTIONS:
- Sign chain of custody document on receipt and release of samples, between each party
- Samples are to be delivered to the laboratory address shown.
- Laboratory contact should sign the COC and send a copy (via email) to the GHD Project Manager and GHD Contact, along with a sample receipt notice, within 24 hours of receipt
- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and ESDAT format.

Sample I.D.	Date and Time	Composite Yes/No	Sample Matrix (S: Soil, W: Water, A/A: Air/ Condensate)	Preservative	Containers: Type (V: vial or St: bag, G: glass bottle, P: plastic bottle)	Containers: Number	Containers: Volume (ml)	Analyses Required: TPAH Full 30 Analytes Suite	HOLD	SEND TO ALS	SAMPLE COMMENTS
MW03_2.0	23-Sep-23		Soil	Ice	J	1			X		
MW03_2.5	23-Sep-23		Soil	Ice	J	1			X		
MW03_3.0	23-Sep-23		Soil	Ice	J	1		X			
MW03_3.5	23-Sep-23		Soil	Ice	J	1			X		
MW03_14.0	23-Sep-23		Soil	Ice	J	1			X		
FD01	22-Sep-23		Soil	Ice	J	1			X		
FS01	22-Sep-23		Soil	Ice	J	1			X		
FD02	22-Sep-23		Soil	Ice	J	1			X		
FS02	22-Sep-23		Soil	Ice	J	1			X		
FD03	22 Sep 23		Soil	Ice	J	1		X			
FS03	22 Sep 23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD04	23 Sep 23		Soil	Ice	J	1		X			
FS04	23-Sep 23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD05	23-Sep-23		Soil	Ice	J	1			X		
FS05	23-Sep-23		Soil	Ice	J	1			X		
FD06	23-Sep-23		Soil	Ice	J	1		X			
FS06	23-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD07	24-Sep-23		Soil	Ice	J	1			X		
FS07	24 Sep 23		Soil	Ice	J	1			X		
FD08	24-Sep-23		Soil	Ice	P	1		X			
FS08	24 Sep 23		Soil	Ice	P	1				X	Please forward to ALS for analysis
FB01	22 Sep 23		Water	Ice	P	1		X			
RB01	22-Sep-23		Water	Ice	P	1		X			
RB02	23-Sep-23		Water	Ice	P	1		X			
RB03	24-Sep-23		Water	Ice	P	1		X			
TOTAL NUMBER OF SAMPLES	113										
TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS				
SAMPLER				
	Date/Time		Relinquished by:	Date/Time
GHD SERVICE CENTRE				
Received by	Date/Time		Relinquished by	Date/Time
COURIER				

Received by: Richard Baez – ALS
30/10/23 – 11:05

relinq by BF
30/10 EF

4

Tyrone Gowans

From: Amy Meunier
Sent: Friday, 27 October 2023 11:28 AM
To: Ally Kirkman
Cc: GHD Lab Reports; Tom Duncan; #AU_CAU001_EnviroSampleVic
Subject: RE: Eurofins Test Results, Invoice - Report 1029914 : Site MFS PETERBOROUGH DSI (12616806)

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: ADDITIONALS

INFO: INTERNAL EMAIL - Sent from your own Eurofins email domain.

Hi Ally,

We will get this organised,

Tyrone – please see below, STD TAT

Kind regards,

Amy Meunier

Analytical Services Manager
Mobile : +61 477 574 867
Email : AmyMeunier@eurofins.com

Eurofins
6 Monterey Road,
Dandenong VIC 3175
Australia

My office hours are 9am to 5:30pm (Monday to Friday)
If you require sample receipt outside these hours please email envirosamplevic@eurofins.com

eurofins Total Sulfur in Soils by LECO, NATA Accredited LEARN MORE

From: Ally Kirkman <ally.kirkman@ghd.com>
Sent: Friday, 27 October 2023 11:19 AM
To: Amy Meunier <AmyMeunier@eurofins.com>
Cc: GHD Lab Reports <GHDLabReports@ghd.com>; Tom Duncan <Thomas.Duncan@ghd.com>
Subject: RE: Eurofins Test Results, Invoice - Report 1029914 : Site MFS PETERBOROUGH DSI (12616806)

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

(4)

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Amy,

Please may we get the following sample also analysed for PFAS full-suite.

Job number: 12616806
Lab report number: 1029914
- FD05

Please also forward the following sample to ALS:
- FS05

Kind regards,
Ally

From: AmyMeunier@eurofins.com <AmyMeunier@eurofins.com>
Sent: Thursday, October 5, 2023 3:44 PM
To: Ally Kirkman <ally.kirkman@ghd.com>
Cc: GHD Lab Reports <GHDLabReports@ghd.com>; Tom Duncan <tom.duncan@ghd.com>
Subject: Eurofins Test Results, Invoice - Report 1029914 : Site MFS PETERBOROUGH DSI (12616806)

Hi Ally,

Please find attached results for your project in the subject header.

Kind regards,

Amy Meunier
Analytical Services Manager
Mobile : +61 477 574 867

Eurofins Environment Testing
6 Monterey Rd
Dandenong South VIC 3175
AUSTRALIA
Email : AmyMeunier@eurofins.com
Website : www.eurofins.com.au/environmental-testing
View our latest EnviroNotes



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(4)

Environmental Division
Melbourne
Work Order Reference
EM2319399

Telephone : + 61-3-8549 9600

GHD

CHAIN OF CUSTODY RECORD
GHD Pty Ltd

GHD Adelaide Office Address	Completion Date / Turnaround	Quote #
Level 4 - 211 Victoria Square, Adelaide SA 5000 Telephone: (08) 8111 5800	STANDARD	Quote GHD STANDARD RATES

Project Number	12519606
Project Name	MFB Peterborough DG
GHD Project Manager	Tom Duncan
GHD Contact	Ally Kinkman
GHD PM email	Tom.Duncan@ghd.com
GHD Contact email	Ally.Kinkman@ghd.com
Laboratory	Eurofins Environmental
Laboratory Address	6 Main Terrace, Richmond SA 5033
Laboratory Contact	Parmal Acharya

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- A signed copy of the COC should be returned to the GHD Project Manager and GHD Contact with the results via email at the completion of analysis as requested.
- All results should reference the Job Number and Project Name.
- All results should be provided in NATA accredited pdf format and ESDAT format.

Sample I.D.	Date and Time	Composite Yes/No	Sample Matrix (S: Soil, W: Water, A/A: Air/ Condensate)	Preservative	Containers: Type (V: vial or St: bag, G: glass bottle, P: plastic bottle)	Containers: Number	Containers: Volume (ml)	Analyses Required: TPAH Full 30 Analytes Suite	HOLD	SEND TO ALS	SAMPLE COMMENTS
MW03_2.0	23-Sep-23		Soil	Ice	J	1			X		
MW03_2.5	23-Sep-23		Soil	Ice	J	1			X		
MW03_3.0	23-Sep-23		Soil	Ice	J	1		X			
MW03_3.5	23-Sep-23		Soil	Ice	J	1			X		
MW03_14.0	23-Sep-23		Soil	Ice	J	1			X		
FD01	22-Sep-23		Soil	Ice	J	1			X		
FS01	22-Sep-23		Soil	Ice	J	1			X		
FD02	22-Sep-23		Soil	Ice	J	1			X		
FS02	22-Sep-23		Soil	Ice	J	1			X		
FD03	22 Sep 23		Soil	Ice	J	1		X			
FS03	22 Sep 23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD04	23 Sep 23		Soil	Ice	J	1		X			
FS04	23-Sep 23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD05	23-Sep-23		Soil	Ice	J	1			X		
FS05	23-Sep-23		Soil	Ice	J	1			X		
FD06	23-Sep-23		Soil	Ice	J	1		X			
FS06	23-Sep-23		Soil	Ice	J	1				X	Please forward to ALS for analysis
FD07	24-Sep-23		Soil	Ice	J	1			X		
FS07	24 Sep 23		Soil	Ice	J	1			X		
FD08	24-Sep-23		Soil	Ice	P	1		X			
FS08	24 Sep 23		Soil	Ice	P	1				X	Please forward to ALS for analysis
FB01	22 Sep 23		Water	Ice	P	1		X			
RB01	22-Sep-23		Water	Ice	P	1		X			
RB02	23-Sep-23		Water	Ice	P	1		X			
RB03	24-Sep-23		Water	Ice	P	1		X			
TOTAL NUMBER OF SAMPLES	113										
TOTAL NUMBER OF ESKIES											

CUSTODY DETAILS				
SAMPLER				
	Date/Time		Relinquished by:	Date/Time
GHD SERVICE CENTRE				
Received by	Date/Time		Relinquished by	Date/Time
COURIER				

Received by: Richard Baez – ALS
30/10/23 – 11:05

relinq by BF
30/10 EF

4

Tyrone Gowans

From: Amy Meunier
Sent: Friday, 27 October 2023 11:28 AM
To: Ally Kirkman
Cc: GHD Lab Reports; Tom Duncan; #AU_CAU001_EnviroSampleVic
Subject: RE: Eurofins Test Results, Invoice - Report 1029914 : Site MFS PETERBOROUGH DSI (12616806)

Follow Up Flag: Follow up
Flag Status: Flagged

Categories: ADDITIONALS

INFO: INTERNAL EMAIL - Sent from your own Eurofins email domain.

Hi Ally,

We will get this organised,

Tyrone – please see below, STD TAT

Kind regards,

Amy Meunier

Analytical Services Manager
Mobile : +61 477 574 867
Email : AmyMeunier@eurofins.com

Eurofins
6 Monterey Road,
Dandenong VIC 3175
Australia

My office hours are 9am to 5:30pm (Monday to Friday)
If you require sample receipt outside these hours please email envirosamplevic@eurofins.com

eurofins Total Sulfur in Soils by LECO, NATA Accredited LEARN MORE

From: Ally Kirkman <ally.kirkman@ghd.com>
Sent: Friday, 27 October 2023 11:19 AM
To: Amy Meunier <AmyMeunier@eurofins.com>
Cc: GHD Lab Reports <GHDLabReports@ghd.com>; Tom Duncan <Thomas.Duncan@ghd.com>
Subject: RE: Eurofins Test Results, Invoice - Report 1029914 : Site MFS PETERBOROUGH DSI (12616806)

CAUTION: EXTERNAL EMAIL - Sent from an email domain that is not formally trusted by Eurofins.

(4)

Do not click on links or open attachments unless you recognise the sender and are certain that the content is safe.

Hi Amy,

Please may we get the following sample also analysed for PFAS full-suite.

Job number: 12616806
Lab report number: 1029914
- FD05

Please also forward the following sample to ALS:
- FS05

Kind regards,
Ally

From: AmyMeunier@eurofins.com <AmyMeunier@eurofins.com>
Sent: Thursday, October 5, 2023 3:44 PM
To: Ally Kirkman <ally.kirkman@ghd.com>
Cc: GHD Lab Reports <GHDLabReports@ghd.com>; Tom Duncan <tom.duncan@ghd.com>
Subject: Eurofins Test Results, Invoice - Report 1029914 : Site MFS PETERBOROUGH DSI (12616806)

Hi Ally,

Please find attached results for your project in the subject header.

Kind regards,

Amy Meunier
Analytical Services Manager
Mobile : +61 477 574 867

Eurofins Environment Testing
6 Monterey Rd
Dandenong South VIC 3175
AUSTRALIA
Email : AmyMeunier@eurofins.com
Website : www.eurofins.com.au/environmental-testing
View our latest EnviroNotes



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SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EM2319399**

Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Peter Ravlic
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
E-mail	: tom.duncan@ghd.com	E-mail	: peter.ravlic@alsglobal.com
Telephone	: ----	Telephone	: +6138549 9645
Facsimile	: ----	Facsimile	: +61-3-8549 9626
Project	: 12616806	Page	: 1 of 3
Order number	: ----	Quote number	: EB2020GHDSER0038 (EN/000)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	:		
Sampler	:		

Dates

Date Samples Received	: 30-Oct-2023 11:05	Issue Date	: 30-Oct-2023
Client Requested Due Date	: 06-Nov-2023	Scheduled Reporting Date	: **06-Nov-2023**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 7.6°C - Ice present
Receipt Detail	:	No. of samples received / analysed	: 1 / 1

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please direct any queries related to sample condition / numbering / breakages to Client Services.**
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **Analytical work for this work order will be conducted at ALS Springvale.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

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

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

Summary of Sample(s) and Requested Analysis

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

Matrix: **SOIL**

Laboratory sample ID	*Sampling date / time*	*Sample ID*	SOIL - EA055-103 Moisture Content	SOIL - EP231X (solids) PFAS - Full Suite (28 analytes)
EM2319399-001	23-Sep-2023 00:00	FS05	✓	✓

Proactive Holding Time Report

The following table summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory.

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

Method / Client Sample ID(s)	Container	Due for extraction	Due for analysis	Samples Received		Instructions Received	
				Date	Evaluation	Date	Evaluation
EA055: Moisture Content							
FS05	HDPE Soil Jar	----	07-Oct-2023	30-Oct-2023	×	----	----

Requested Deliverables

ACCOUNTS PAYABLE

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

Accounts Payable Australia

- A4 - AU Tax Invoice (INV)	Email	accountspayableAU@ghd.com

ALLY KIRKMAN

- *AU Certificate of Analysis - NATA (COA)	Email	ally.kirkman@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ally.kirkman@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ally.kirkman@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ally.kirkman@ghd.com
- Chain of Custody (CoC) (COC)	Email	ally.kirkman@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ally.kirkman@ghd.com
- EDI Format - XTab (XTAB)	Email	ally.kirkman@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ally.kirkman@ghd.com

GHD LAB REPORTS

- *AU Certificate of Analysis - NATA (COA)	Email	ghdlabreports@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	ghdlabreports@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	ghdlabreports@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	ghdlabreports@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	ghdlabreports@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	ghdlabreports@ghd.com

TOM DUNCAN

- *AU Certificate of Analysis - NATA (COA)	Email	tom.duncan@ghd.com
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	tom.duncan@ghd.com
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	tom.duncan@ghd.com
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	tom.duncan@ghd.com
- A4 - AU Tax Invoice (INV)	Email	tom.duncan@ghd.com
- Chain of Custody (CoC) (COC)	Email	tom.duncan@ghd.com
- EDI Format - ESDAT (ESDAT)	Email	tom.duncan@ghd.com
- EDI Format - XTab (XTAB)	Email	tom.duncan@ghd.com
- Electronic SRN for ESdat (ESRN_ESDAT)	Email	tom.duncan@ghd.com

QUALITY CONTROL REPORT

Work Order	: **EM2319399**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Peter Ravlic
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12616806	Date Samples Received	: 30-Oct-2023
Order number	: ----	Date Analysis Commenced	: 30-Oct-2023
C-O-C number	: ----	Issue Date	: 06-Nov-2023
Sampler	: ----		
Site	:		
Quote number	: EN/000		
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*
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

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: 5393110)									
EM2319399-001	FS05	EA055: Moisture Content	----	0.1	%	45.3	47.1	4.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5399192)									
EM2319393-001	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
EM2319416-032	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: 5399192)									
EM2319393-001	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

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: 5399192) - continued									
EM2319393-001	Anonymous	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
EM2319416-032	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5399192)									
EM2319393-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EM2319416-032	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5399192)									

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: 5399192) - continued									
EM2319393-001	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
EM2319416-032	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5399192)									
EM2319393-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EM2319416-032	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	<0.0002	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: 5399192)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	86.4	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	100	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	93.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	93.0	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	86.5	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	78.1	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5399192)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.1	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.0	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.1	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.7	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.4	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.9	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.3	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.0	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.0	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5399192)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.2	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	86.8	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.3	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.5	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.1	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	108	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5399192)								

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: 5399192) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	91.7	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	95.2	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	98.7	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00121 mg/kg	101	70.0	130
EP231P: PFAS Sums (QCLot: 5399192)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5399192)							
EM2319393-013	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	88.8	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	99.8	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	92.5	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	101	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	73.5	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	73.6	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5399192)							
EM2319393-013	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	84.1	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	89.2	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	92.3	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	88.6	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	94.5	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	95.0	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	97.9	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.7	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	88.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	87.8	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	99.8	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5399192)							

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: 5399192) - continued							
EM2319393-013	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	96.5	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	86.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	85.2	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	101	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	99.1	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	90.7	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	61.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5399192)							
EM2319393-013	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	0.00119 mg/kg	96.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	98.5	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	91.0	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2319399**	Page	: 1 of 4
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Telephone	: +6138549 9645
Project	: 12616806	Date Samples Received	: 30-Oct-2023
Site	:	Issue Date	: 06-Nov-2023
Sampler	: ----	No. of samples received	: 1
Order number	: ----	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

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Analysis Holding Time Compliance

Matrix: **SOIL**

Method / Container / Client Sample ID(s)	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA055: Moisture Content (Dried @ 105-110°C)						
HDPE Soil Jar						
FS05	----	----	----	30-Oct-2023	07-Oct-2023	**23**

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)							
FS05	**23-Sep-2023**	**----**	----	**----**	**30-Oct-2023**	07-Oct-2023	×
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
FS05	**23-Sep-2023**	**02-Nov-2023**	21-Mar-2024	✓	**03-Nov-2023**	12-Dec-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
FS05	**23-Sep-2023**	**02-Nov-2023**	21-Mar-2024	✓	**03-Nov-2023**	12-Dec-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
FS05	**23-Sep-2023**	**02-Nov-2023**	21-Mar-2024	✓	**03-Nov-2023**	12-Dec-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
FS05	**23-Sep-2023**	**02-Nov-2023**	21-Mar-2024	✓	**03-Nov-2023**	12-Dec-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
FS05	**23-Sep-2023**	**02-Nov-2023**	21-Mar-2024	✓	**03-Nov-2023**	12-Dec-2023	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **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	1	**100.00**	**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.

CERTIFICATE OF ANALYSIS

Work Order	: **EM2319399**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Peter Ravlic
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9645
Project	: 12616806	Date Samples Received	: 30-Oct-2023 11:05
Order number	: ----	Date Analysis Commenced	: 30-Oct-2023
C-O-C number	: ----	Issue Date	: 06-Nov-2023 12:39
Sampler	: ----		
Site	:		
Quote number	: EN/000		
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*
Nancy Wang	2IC Organic Chemist	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

General Comments

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

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

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

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

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

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

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

- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS05	----	----	----	----
				Sampling date / time	23-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2319399-001	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**45.3**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		**0.0021**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		**0.0019**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0158**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0014**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.299**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		**0.0213**	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		**0.003**	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0018**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0019**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0008**	----	----	----	----
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		**0.0004**	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		**0.0002**	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		**0.0009**	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS05	----	----	----	----
				Sampling date / time	23-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2319399-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	----	----	----	----
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		**0.351**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.315**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.324**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**106**	----	----	----	----
13C8-PFOA	----	0.0002	%		**98.5**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231S: PFAS Surrogate			
13C4-PFOS	----	68	136
13C8-PFOA	----	69	133

Appendix G

Tabulated Analytical Results

Table 1
Soil Analytical Results

					PFAS - Perfluoroalkyl Sulfonic Acids							PFAS - Perfluoroalkyl Carboxylic Acids							
					Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL					0.005	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure										1						10			
PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed sites										0.14#1									
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)								2		2						20			
SA MFS Site Specific Criteria - Regional (Retained)																50			
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**															
BH01	24 Sep 2023	BH01_0.5	1029914	0.5	<0.005	<0.0002	<0.005	0.0154#2	<0.005	0.27#2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH01	24 Sep 2023	BH01_2.0	1029914	2	<0.005	<0.005	<0.005	0.0051	<0.005	0.12	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH03	24 Sep 2023	BH03_0.1	1029914	0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.15	0.0067	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH03	24 Sep 2023	BH03_1.5	1029914	1.5	<0.005	0.0090	0.0070	0.071	<0.005	0.085	<0.005	<0.005	<0.005	0.019	<0.005	<0.005	<0.005	<0.005	<0.005
BH04	24 Sep 2023	BH04_0.5	1029914	0.5	<0.005	<0.005	<0.005	0.013	<0.005	0.4	<0.005	<0.005	0.0056	0.0057	<0.005	<0.005	<0.005	<0.005	<0.005
BH04	24 Sep 2023	BH04_2.5	1029914	2.5	<0.005	<0.005	<0.005	0.055	<0.005	0.28	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH05	22 Sep 2023	BH05_0.5	1029914	0.5	<0.005	<0.005	<0.005	0.019	<0.005	0.81	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH05	22 Sep 2023	BH05_2.5	1029914	2.5	<0.005	0.0002	0.0005	0.0075#2	0.0012#2	0.62#2	<0.005	<0.005	0.0005#2	0.0022#2	<0.005	0.0005#2	<0.005	<0.005	<0.005
BH06	22 Sep 2023	BH06_0.5	1029914	0.5	<0.005	<0.005	<0.005	<0.005	<0.005	0.51	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH06	22 Sep 2023	BH06_3.5	1029914	3.5	<0.005	<0.005	<0.005	0.042	<0.005	<0.005	<0.005	<0.005	<0.005	0.0051	<0.005	<0.005	<0.005	<0.005	<0.005
MW01	23 Sep 2023	MW01_0.5	1029914	0.5	<0.005	<0.005	<0.005	0.021	<0.005	0.81	0.0077	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW01	23 Sep 2023	MW01_4.5	1029914	4.5	<0.005	<0.005	<0.005	<0.005	<0.005	0.08#2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW02	22 Sep 2023	MW02_5.5	1029914	5.5	<0.005	<0.005	<0.005	0.0100	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW02	22 Sep 2023	MW02_0.5	1029914	0.5	<0.005	<0.005	<0.005	0.022	<0.005	1.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW03	23 Sep 2023	MW03_0.5	1029914	0.5	<0.005	<0.005	<0.005	<0.005	<0.005	0.39	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW03	23 Sep 2023	MW03_3.0	1029914	3	<0.005	0.0056	0.0060	0.038	0.0032	0.0035	<0.005	<0.005	0.0009	0.0071	0.0006	0.0007	<0.005	<0.005	<0.005
SS01	24 Sep 2023	SS01	1029914	0	<0.005	<0.005	<0.005	<0.005	<0.005	0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS02	24 Sep 2023	SS02	1029914	0	<0.005	<0.005	<0.005	0.022	<0.005	0.33	0.021#2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS03	24 Sep 2023	SS03	1029914	0	<0.005	<0.005	<0.005	0.0070	<0.005	0.18	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS04	24 Sep 2023	SS04	1029914	0	<0.005	<0.005	<0.005	<0.005	<0.005	0.059	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Notes:
#1 This is the higher criterion for (the existing ecological indirect exposure) intensely developed sites with no secondary consumers and minimal potential for indirect ecological exposure.
#2 Higher QA/QC result reported.

Table 1
Soil Analytical Results

				PFAS - Perfluoroalkyl Carboxylic Acids			PFAS - Perfluoroalkyl Sulfonamide								PFAS - Fluorotelomer Sulfonic Acids			
				Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)
				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
EQL				0.0002	0.0002	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0005	0.0002	0.0005	0.0005	0.0005	0.0005
PFAS NEMP 2.0 2020 Ecological direct exposure																	
PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed sites																	
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)																	
SA MFS Site Specific Criteria - Regional (Retained)																	
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**													
BH01	24 Sep 2023	BH01_0.5	1029914	0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
BH01	24 Sep 2023	BH01_2.0	1029914	2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
BH03	24 Sep 2023	BH03_0.1	1029914	0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
BH03	24 Sep 2023	BH03_1.5	1029914	1.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
BH04	24 Sep 2023	BH04_0.5	1029914	0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	0.062	<0.005	<0.005
BH04	24 Sep 2023	BH04_2.5	1029914	2.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
BH05	22 Sep 2023	BH05_0.5	1029914	0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
BH05	22 Sep 2023	BH05_2.5	1029914	2.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
BH06	22 Sep 2023	BH06_0.5	1029914	0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
BH06	22 Sep 2023	BH06_3.5	1029914	3.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
MW01	23 Sep 2023	MW01_0.5	1029914	0.5	<0.005	<0.005	<0.005	0.0061	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
MW01	23 Sep 2023	MW01_4.5	1029914	4.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
MW02	22 Sep 2023	MW02_5.5	1029914	5.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
MW02	22 Sep 2023	MW02_0.5	1029914	0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
MW03	23 Sep 2023	MW03_0.5	1029914	0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
MW03	23 Sep 2023	MW03_3.0	1029914	3	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
SS01	24 Sep 2023	SS01	1029914	0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
SS02	24 Sep 2023	SS02	1029914	0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
SS03	24 Sep 2023	SS03	1029914	0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005
SS04	24 Sep 2023	SS04	1029914	0	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005

Notes:
#1 This is the higher criterion for (the existing ecological indirect exposure) intensely developed sites with no secondary consumers and minimal potential for indirect ecological exposure.
#2 Higher QA/QC result reported.

Table 1
Soil Analytical Results

					PFAS - Sums					PFAS
					Sum of PFHxS and PFOS	Sum of US EPA PFAS (PFOS + PFOA)*	PFAS (Sum of Total)	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	PFAS (Sum of Total)(WA DER List)	Perfluorononane sulfonate (PFNS)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL					0.0002	0.005	0.0002	0.005	0.0002	0.005
PFAS NEMP 2.0 2020 Ecological direct exposure										
PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed sites										
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)					2					
SA MFS Site Specific Criteria - Regional (Retained)					40					
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**						
BH01	24 Sep 2023	BH01_0.5	1029914	0.5	0.285#2	0.23	0.296#2	0.242#2	0.289#2	<0.005
BH01	24 Sep 2023	BH01_2.0	1029914	2	0.1251	0.12	0.1251	0.1251	0.1251	<0.005
BH03	24 Sep 2023	BH03_0.1	1029914	0.1	0.15	0.15	0.1641	0.15	0.15	0.0074
BH03	24 Sep 2023	BH03_1.5	1029914	1.5	0.156	0.085	0.191	0.156	0.184	<0.005
BH04	24 Sep 2023	BH04_0.5	1029914	0.5	0.413	0.4	0.4983	0.413	0.4863	0.012
BH04	24 Sep 2023	BH04_2.5	1029914	2.5	0.335	0.28	0.335	0.335	0.335	<0.005
BH05	22 Sep 2023	BH05_0.5	1029914	0.5	0.829	0.81	0.863	0.829	0.829	0.034
BH05	22 Sep 2023	BH05_2.5	1029914	2.5	0.626#2	0.58	0.632#2	0.5871	0.630#2	<0.005
BH06	22 Sep 2023	BH06_0.5	1029914	0.5	0.51	0.51	0.5196	0.51	0.51	0.0096
BH06	22 Sep 2023	BH06_3.5	1029914	3.5	0.042	<0.005	<0.05	0.042	0.0471	<0.005
MW01	23 Sep 2023	MW01_0.5	1029914	0.5	0.831	0.81	0.8648	0.831	0.831	0.02
MW01	23 Sep 2023	MW01_4.5	1029914	4.5	0.081#2	0.065	0.065	0.065	0.065	<0.005
MW02	22 Sep 2023	MW02_5.5	1029914	5.5	0.01	<0.005	<0.05	0.01	0.01	<0.005
MW02	22 Sep 2023	MW02_0.5	1029914	0.5	1.122	1.1	1.122	1.122	1.122	<0.005
MW03	23 Sep 2023	MW03_0.5	1029914	0.5	0.39	0.39	0.39	0.39	0.39	<0.005
MW03	23 Sep 2023	MW03_3.0	1029914	3	0.038	<0.005	0.0567	0.038	0.0507	<0.005
SS01	24 Sep 2023	SS01	1029914	0	0.1	0.1	0.1	0.1	0.1	<0.005
SS02	24 Sep 2023	SS02	1029914	0	0.352	0.33	0.385	0.352	0.352	0.016
SS03	24 Sep 2023	SS03	1029914	0	0.187	0.18	0.2045	0.187	0.187	0.0075
SS04	24 Sep 2023	SS04	1029914	0	0.059	0.059	0.059	0.059	0.059	<0.005

Notes:
#1 This is the higher criterion for (the existing ecological indirect exposure) intensely developed sites with no secondary consumers and minimal potential for indirect ecological exposure.
#2 Higher QA/QC result reported.

Table 2
Groundwater Analytical Results

			PFAS - Perfluoroalkyl Sulfonic Acids							PFAS - Perfluoroalkyl Carboxylic Acids										
			Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			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	0.01
ADWG 2011 Health (v3.8 updated 2022)														0.56						
ADWG 2011 Recreational (v3.8 updated 2022)														5.6						
PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems								0.13						220						
PFAS NEMP 2.0 2020 Freshwater - 99% - high conservation value systems								0.00023						19						
Location Code	**Date**	**Lab Report Number**																		
MW01	27 Sep 2023	1031206	1.3	4.1	5.5	48	0.87	1.0	<0.01	0.84	0.87	5.0	0.69	0.90	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW02	27 Sep 2023	1031206	0.48*	1.1*	0.88*	4.2*	0.09*	0.61*	<0.01	0.2*	0.32*	1.5*	0.08*	0.07*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
MW03	27 Sep 2023	1031206	0.87	2.9	3.4	28	0.57	0.70	<0.01	0.44	0.83	3.5	0.46	0.81	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Note: * Higher QA/QC result reported.

Table 2
Groundwater Analytical Results

			PFAS - Perfluoroalkyl Sulfonamide							PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums					PFAS
			Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer Sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	Sum of PFHxS and PFOS	Sum of US EPA PFAS (PFOS + PFOA)*	PFAS (Sum of Total)	Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	PFAS (Sum of Total)(WA DER List)	Perfluorononane sulfonate (PFNS)
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.01	0.01	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.01	0.05	0.01	0.01	0.01	0.01	0.1	0.01	0.05	0.01
ADWG 2011 Health (v3.8 updated 2022)																0.07					
ADWG 2011 Recreational (v3.8 updated 2022)																0.7					
PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems																					
PFAS NEMP 2.0 2020 Freshwater - 99% - high conservation value systems																					
Location Code	**Date**	**Lab Report Number**																			
MW01	27 Sep 2023	1031206	1.3	4.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	0.13	<0.01	<0.01	49	1.9	69.2	49.9	61.53	<0.01
MW02	27 Sep 2023	1031206	0.48*	1.1*	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	4.8*	0.69*	8.9*	3.56*	6.02	<0.01
MW03	27 Sep 2023	1031206	0.87	2.9	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05	<0.01	<0.01	28.7	1.51	42.48	29.51	37.64	<0.01

Note: * Higher QA/QC result reported.

Location Code			BH05	BH05		BH05	BH05		MW01	MW01		MW01	MW01		MW03	MW03		MW03	MW03	
Date			22 Sep 2023	22 Sep 2023		22 Sep 2023	22 Sep 2023		23 Sep 2023	23 Sep 2023		23 Sep 2023	23 Sep 2023		23 Sep 2023	23 Sep 2023		23 Sep 2023	23 Sep 2023	
Field ID			BH05_2.5	FD03		BH05_2.5	FS03		MW01_4.5	FD06		MW01_4.5	FS06		MW03_3.0	FD04		MW03_3.0	FS04	
Lab Report Number			1029914	1029914		1029914	EM2317441		1029914	1029914		1029914	EM2317441		1029914	1029914		1029914	EM2317441	
Matrix Type			Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
Sample Type			Normal	Field_D	RPD	Normal	Interlab_D	RPD	Normal	Field_D	RPD	Normal	Interlab_D	RPD	Normal	Field_D	RPD	Normal	Interlab_D	RPD
	Unit	EQL																		
Misc																				
% Moisture	%	1	10	11	10	10	-	-	7.5	20	91	7.5	-	-	6.7	9.3	33	6.7	-	-
Inorganics																				
Moisture (%)	%	0.1	-	-	-	-	10.6	-	-	-	-	-	11.1	-	-	-	-	-	12.8	-
PFAS - Perfluoroalkyl Sulfonic Acids																				
Perfluoropropanesulfonic acid (PFPrS)	mg/kg	0.005	<0.005	<0.005	0	<0.005	-	-	<0.005	<0.005	0	<0.005	-	-	<0.005	<0.005	0	<0.005	-	-
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	0.0056	<0.005	11	0.0056	0.0037	**41**
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0005	0	<0.005	<0.005	0	<0.005	<0.0002	0	0.0060	<0.005	18	0.0060	0.0045	29
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	0.0071	0.0056	24	0.0071	0.0075	5	<0.005	<0.005	0	<0.005	0.0014	0	0.038	0.018	**71**	0.038	0.0254	**40**
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0012	0	<0.005	<0.005	0	<0.005	0.0006	0	<0.005	<0.005	0	<0.005	0.0032	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	0.58	0.58	0	0.58	0.619	7	0.065	0.043	**41**	0.065	0.0796	20	<0.005	<0.005	0	<0.005	0.0035	0
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
PFAS - Perfluoroalkyl Carboxylic Acids																				
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.005	<0.005	0	<0.005	<0.001	0	<0.005	<0.005	0	<0.005	<0.001	0	<0.005	<0.005	0	<0.005	<0.001	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0005	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	0.0009	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0022	0	<0.005	<0.005	0	<0.005	<0.0002	0	0.0071	<0.005	-	0.0071	0.0067	6
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	0.0006	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0005	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	0.0007	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
PFAS - Perfluoroalkyl Sulfonamide																				
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.01	<0.01	0	<0.01	<0.0002	0	<0.01	<0.01	0	<0.01	<0.0002	0	<0.01	<0.01	0	<0.01	<0.0002	0
N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.01	<0.01	0	<0.01	<0.0002	0	<0.01	<0.01	0	<0.01	<0.0002	0	<0.01	<0.01	0	<0.01	<0.0002	0
PFAS - Fluorotelomer Sulfonic Acids																				
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
6:2 Fluorotelomer Sulfonate (6:2 FTS)	mg/kg	0.0005	<0.01	<0.01	0	<0.01	<0.0005	0	<0.01	<0.01	0	<0.01	<0.0005	0	<0.01	<0.01	0	<0.01	<0.0005	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
PFAS - Sums																				
Sum of PFHxS and PFOS	mg/kg	0.0002	0.5871	0.5856	0	0.5871	0.626	6	0.065	0.043	**41**	0.065	0.0810	22	0.038	0.018	**71**	0.038	0.0289	27
Sum of US EPA PFAS (PFOS + PFOA)*	mg/kg	0.005	0.58	0.58	0	0.58	-	-	0.065	0.043	**41**	0.065	-	-	<0.005	<0.005	0	<0.005	-	-
PFAS (Sum of Total)	mg/kg	0.0002	0.5871	0.5856	0	0.5871	0.632	7	0.065	<0.05	26	0.065	0.0816	23	0.0567	<0.05	13	0.0567	0.0492	14
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	mg/kg	0.005	0.5871	0.5856	0	0.5871	-	-	0.065	0.043	**41**	0.065	-	-	0.038	0.018	**71**	0.038	-	-
PFAS (Sum of Total)(WA DER List)	mg/kg	0.0002	0.5871	0.5856	0	0.5871	0.630	7	0.065	0.043	**41**	0.065	0.0810	22	0.0507	0.018	**95**	0.0507	0.0415	20
PFAS																				
Perfluorononane sulfonate (PFNS)	mg/kg	0.005	<0.005	<0.005	0	<0.005	-	-	<0.005	<0.005	0	<0.005	-	-	<0.005	<0.005	0	<0.005	-	-

Notes:
*RPDs have only been considered where a concentration is greater than 10 times the EQL.
**Elevated RPDs are highlighted as per QA/QC Profile settings - Acceptable RPDs < 30
***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.

Location Code			SS02	SS02		SS02	SS02		BH01	BH01		BH01	BH01	
Date			23 Sep 2023	24 Oct 2023		23 Sep 2023	23 Sep 2023		24 Sep 2023	24 Sep 2023		24 Sep 2023	24 Sep 2023	
Field ID			SS02	FD05		SS02	FS05		BH01_0.5	FD08		BH01_0.5	FS08	
Lab Report Number			1029914	1038803		1029914	EM2319399		1029914	1029914		1029914	EM2317441	
Matrix Type			Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
Sample Type			Normal	Field_D	RPD	Normal	Interlab_D	RPD	Normal	Field_D	RPD	Normal	Interlab_D	RPD
	Unit	EQL												
Misc_														
% Moisture_	%	1	4.0	7.5	61	4.0	-	-	11	8.3	28	11	-	-
Inorganics														
Moisture (%)	%	0.1	-	-	-	-	45.3	-	-	-	-	-	7.8	-
PFAS - Perfluoroalkyl Sulfonic Acids														
Perfluoropropanesulfonic acid (PFPrS)	mg/kg	0.005	<0.005	<0.005	0	<0.005	-	-	<0.005	<0.005	0	<0.005	-	-
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0021	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0019	0	<0.005	<0.005	0	<0.005	0.0003	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	0.022	0.019	15	0.022	0.0158	**33**	0.0069	0.012	**54**	0.0069	0.0154	**76**
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0014	0	<0.005	<0.005	0	<0.005	0.0017	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	0.33	0.32	3	0.33	0.299	10	0.23	0.23	0	0.23	0.270	16
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002	0.017	0.018	6	0.017	0.0213	22	<0.005	<0.005	0	<0.005	0.0021	0
PFAS - Perfluoroalkyl Carboxylic Acids														
Perfluorobutanoic acid (PFBA)	mg/kg	0.001	<0.005	<0.005	0	<0.005	0.003	0	<0.005	<0.005	0	<0.005	<0.001	0
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0018	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0019	0	<0.005	<0.005	0	<0.005	0.0007	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	0.0003	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0008	0	<0.005	<0.005	0	<0.005	0.0015	0
Perfluorononanoic acid (PFNA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	0.0004	0
Perfluorodecanoic acid (PFDA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0002	0	<0.005	<0.005	0	<0.005	0.0003	0
Perfluorododecanoic acid (PFDoDA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0004	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
PFAS - Perfluoroalkyl Sulfonamide														
Perfluorooctane sulfonamide (FOSA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0009	0	<0.005	<0.005	0	<0.005	0.0020	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.0002	<0.01	<0.01	0	<0.01	<0.0002	0	<0.01	<0.01	0	<0.01	<0.0002	0
N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.0002	<0.01	<0.01	0	<0.01	<0.0002	0	<0.01	<0.01	0	<0.01	<0.0002	0
PFAS - Fluorotelomer Sulfonic Acids														
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
6:2 Fluorotelomer Sulfonate (6:2 FTS)	mg/kg	0.0005	<0.01	<0.01	0	<0.01	<0.0005	0	<0.01	<0.01	0	<0.01	<0.0005	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	0.0008	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.0005	<0.005	<0.005	0	<0.005	<0.0005	0	<0.005	<0.005	0	<0.005	<0.0005	0
PFAS - Sums														
Sum of PFHxS and PFOS	mg/kg	0.0002	0.352	0.339	4	0.352	0.315	11	0.2369	0.242	2	0.2369	0.285	18
Sum of US EPA PFAS (PFOS + PFOA)*	mg/kg	0.005	0.33	0.32	3	0.33	-	-	0.23	0.23	0	0.23	-	-
PFAS (Sum of Total)	mg/kg	0.0002	0.385	0.373	3	0.385	0.351	9	0.2369	0.242	2	0.2369	0.296	22
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	mg/kg	0.005	0.352	0.339	4	0.352	-	-	0.2369	0.242	2	0.2369	-	-
PFAS (Sum of Total)(WA DER List)	mg/kg	0.0002	0.352	0.339	4	0.352	0.324	8	0.2369	0.242	2	0.2369	0.289	20
PFAS														
Perfluorononane sulfonate (PFNS)	mg/kg	0.005	0.016	0.016	0	0.016	-	-	<0.005	<0.005	0	<0.005	-	-

Notes:
*RPDs have only been considered where a concentration is greater than 10 times the EQL.
**Elevated RPDs are highlighted as per QA/QC Profile settings - Acceptable RPDs < 30
***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 4
RPD Results - Groundwater

		Location Code	MW02	MW02		MW02	MW02	
		Date	27 Sep 2023	27 Sep 2023		27 Sep 2023	27 Sep 2023	
		Field ID	MW02	FD01		MW02	FS01	
		Lab Report Number	1031206	1031206		1031206	39940	
		Matrix Type	Water	Water		Water	Water	
		Sample Type	Normal	Field_D	RPD	Normal	Interlab_D	RPD
	Unit	EQL						
PFAS - Perfluoroalkyl Sulfonic Acids								
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01	0.41	0.48	16	0.41	-	-
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	0.89	0.91	2	0.89	1.1	21
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	0.64	0.77	18	0.64	0.88	**32**
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	2.9	3.0	3	2.9	4.2	**37**
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	0.07	0.06	15	0.07	0.09	25
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	0.52	0.51	2	0.52	0.61	16
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
PFAS - Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	µg/L	0.02	0.16	0.16	0	0.16	0.2	22
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	0.24	0.23	4	0.24	0.32	29
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	1.1	1.1	0	1.1	1.5	**31**
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	0.06	0.06	0	0.06	0.08	29
Perfluorooctanoic acid (PFOA)	µg/L	0.01	0.05	0.05	0	0.05	0.07	**33**
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.1	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.5	0
PFAS - Perfluoroalkyl Sulfonamide								
Perfluorooctane sulfonamide (FOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.1	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.1	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0
N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.05	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.5	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.02	0
PFAS - Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.01	0
6:2 Fluorotelomer Sulfonate (6:2 FTS)	µg/L	0.01	<0.05	<0.05	0	<0.05	<0.01	0
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.02	0
PFAS - Sums								
Sum of PFHxS and PFOS	µg/L	0.01	3.42	3.51	3	3.42	4.8	**34**
Sum of US EPA PFAS (PFOS + PFOA)*	µg/L	0.01	0.57	0.56	2	0.57	0.69	19
PFAS (Sum of Total)	µg/L	0.01	7.04	7.33	4	7.04	8.9	23
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	µg/L	0.01	3.47	3.56	3	3.47	-	-
PFAS (Sum of Total)(WA DER List)	µg/L	0.05	5.92	6.02	2	5.92	-	-
PFAS								
Perfluorononane sulfonate (PFNS)	µg/L	0.01	<0.01	<0.01	0	<0.01	-	-

Notes:
*RPDs have only been considered where a concentration is greater than 10 times the EQL.
**Elevated RPDs are highlighted as per QA/QC Profile settings - Acceptable RPDs < 30
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory.

		Date	22 Sep 2023	22 Sep 2023	23 Sep 2023	24 Sep 2023	27 Sep 2023	27 Sep 2023
		Lab Report Number	1029914	1029914	1029914	1029914	1031206	1031206
		Sample Type	Field Blank	Rinsate Blank	Rinsate Blank	Rinsate Blank	Field Blank	Rinsate Blank
		Sample ID	FB01	RB01	RB02	RB03	FB01	RB01
	Unit	EQL						
PFAS - Perfluoroalkyl Sulfonic Acids								
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PFAS - Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PFAS - Perfluoroalkyl Sulfonamide								
Perfluorooctane sulfonamide (FOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PFAS - Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
6:2 Fluorotelomer Sulfonate (6:2 FTS)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PFAS - Sums								
Sum of PFHxS and PFOS	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Sum of US EPA PFAS (PFOS + PFOA)*	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PFAS (Sum of Total)	µg/L	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PFAS (Sum of Total)(WA DER List)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PFAS								
Perfluorononane sulfonate (PFNS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Appendix H

Well Permits

Government of South Australia
Department for Environment and Water

Water and River Murray Group
Water Licensing Branch
11 Helen Street
Mount Gambier SA 5290
PO Box 1046
Mount Gambier SA 5290
Australia
Tel (08) 8735 1134

dew.lcwaterlicensing@sa.gov.au
www.environment.sa.gov.au
www.waterconnect.sa.gov.au

TO THE WELL CONSTRUCTION PERMIT HOLDER

Your well construction permit, which is valid for **12 months** from the date of issue is enclosed. A licensed driller must carry out the work on your well in accordance with the enclosed general specifications and permit conditions. A licensed driller includes the holder of a South Australian well drillers licence, or a holder of an interstate drillers licence who has registered to work in South Australia under Automatic Mutual Recognition using the Automatic recognition of licences | Consumer and Business Services | South Australia (cbs.sa.gov.au)

Compliance with these provisions will protect the state's underground water resources and ensure successful completion of the well. The driller is also required to collect a water sample from your well which will be tested for salinity content and test results can be found on the Ground Water Data System by going to www.waterconnect.sa.gov.au.

Please note that if you are in a prescribed wells area the following definitions of stock and domestic apply:

- **Stock:** The provision of drinking water for grazing stock only (i.e. stock not subject to intensive farming).
- **Domestic:** For ordinary household purposes and includes the watering of a garden used in conjunction with a dwelling and not exceeding 0.4 hectares.

If you intend to use water from the proposed well for domestic or human consumption use, it is recommended that you undertake your own water quality testing prior to using the groundwater supply.

THE PERMIT IS NOT TRANSFERABLE. If the property upon which the permit work is to be undertaken is sold, the new land owner must make application for another permit prior to the commencement of any work.

In South Australia, native vegetation is protected by the *Native Vegetation Act 1991*. Clearance includes the draining or flooding of land, including actions that result in the substantial damage to native vegetation, this might include activities that lower the water tables and as a result impact on water dependant wetland communities. In most cases the clearance of native vegetation requires the consent of the Native Vegetation Council. For Further information regarding native vegetation clearance approvals, is available from: http://www.environment.sa.gov.au/managing-natural-resources/native-vegetation .

Under Section 216 of the *Landscape South Australia Act 2019,* you have a right of appeal to the Environment, Resources and Development Court against the imposition of any condition on the permit. The appeal must be instituted within six weeks of the date of permit issue. The appeal must also be served upon the Department within that time.

Enclosed is a copy of the General Specification for Well Construction which explains requirements for the well under 'The Act'.

For all other information please go to www.waterconnect.sa.gov.au or contact Water Licensing South East within the Department for Environment and Water on dew.lcwaterlicensing@sa.gov.au or (08) 8735 1134.

Yours sincerely



Dean Zeven
Team Leader – Limestone Coast
Delegate of Minister Department for Climate, Environment and Water

General specification for well drilling operations affecting water in South Australia

Undertaken pursuant to a well drillers' licence issued under section 115 of the *Landscape South Australia Act 2019*

Government of South Australia

Department for Environment and Water

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Introduction

Pursuant to section 115(3) of the *Landscape South Australia Act 2019* (the Act) a well drillers' licence is subject to such conditions prescribed from time to time by the *Landscape South Australia (Water Management) Regulations 2020* (the Regulations) and to such further conditions specified on the well drillers' licence by the Chief Executive.

Regulation 25 of the Regulations prescribes a number of conditions in relation to well drillers' licences, including that the licence holder must comply with certain directions given by the Chief Executive.

Part A of this document summarises well related obligations under the Act. Part B of this document includes additional directions, pursuant to Regulation 25 of the Regulations.

Both the provisions in the Act and my directions are binding and must be complied with by all well drillers, whether the work authorised by a well permit is undertaken by a person who is a licensed well driller or by a person who is supervised by a licensed well driller.

Directions in Part B are subject to further directions made by me or my delegate in writing from time to time.

Definitions

Chief Executive means the Chief Executive of the Department for Environment and Water.

Delegate means an officer of the Department for Environment and Water who has been authorised to act on behalf of the Chief Executive.

Department for Environment and Water means this, or any subsequent or equivalent department name, being the administrative unit designated from time to time by the Minister by notice in the Gazette as being the department primarily responsible for assisting a Minister in the administration of the Act.

Drilling Inspector means a Drilling Inspector of the Department for Environment and Water or any person appointed by the Chief Executive of the Department for Environment and Water from time to time. Any person holding such position or acting in such position has been appointed to be an authorised officer pursuant to and for the purposes of the Act.

Licensed well driller means a person who holds a licence under Part 8 of the Act to drill wells.

Minimum Construction Requirements means the Minimum Construction Requirements for Water Bores in Australia, Fourth edition 2020 (ISBN 978-0-646-81881-8).

Permit holder means a person who holds a well permit issued by the Department for Environment and Water to construct a well on a specified location. A permit holder may or may not be the land owner.

Supervision by a licensed well driller means supervision on the site where well drilling operations are being undertaken and not remote or off-site supervision.

The Act means the *Landscape South Australia Act 2019.*

The Regulations means the *Landscape South Australia (Water Management) Regulations 2020.*

Well drilling operations includes drilling, plugging, backfilling, sealing, repairing, replacing or altering the casing, lining or screen of a well.

Well permit means an authorisation issued by the Department for Environment and Water to construct a well on a specified location. This document lists relevant legislative requirements, authorises construction and outlines conditions relating to the well drilling operations, as listed above.

PART A: Well Drillers' Obligations

1. Obligations under the Act

1.1. In South Australia, provisions relating to wells are contained in Part 8 Subdivision 5 of the Act. Including but not limited to:

- Section 115(3) of the Act - a licensed well driller must comply with the conditions as specified in the well drillers' licence or prescribed by the Regulations (Regulation 25).
- Section 115(4) of the Act - it is an offence to contravene or fail to comply with a condition of the well drillers licence. In such a case, I may cancel or suspend the licence, or vary a condition of the licence and penalties may apply.

1.2. In addition, pursuant to section 104(3) of the Act, the following activities must not be undertaken unless authorised to do so by a well permit or a water management authorisation (i.e. a water resource works approval):

- drilling, plugging, backfilling, or sealing of a well, and/or
- repairing, replacing or altering the casing, lining or screen of a well.

1.3. Schedule 3 of the Act sets out classes of wells in relation to which a permit is not required.

1.4. Pursuant to section 112(8) of the Act, it is a condition of a well permit to undertake well drilling operations that the work be undertaken by a person who is a licensed well driller or is supervised in carrying out the work by a licensed well driller.

1.5. Pursuant to section 120(3) of the Act, if, in the opinion of the Chief Executive, a defect in a well resulted from work carried out by a licensed well driller, the Chief Executive may serve notice on the well driller directing that:

- the work or other action specified in the notice be carried out or taken to remedy the problem, and/or
- the well be plugged, backfilled or sealed.

Such a notice must not be served no later than six months after the work was carried out.

1.6. Pursuant to section 120(4) of the Act, a well driller on whom a notice is served is entitled to enter the land on which the well is situated in order to comply with the notice. Failure to comply with the notice is an offence for which penalties may apply.

1.7. In undertaking well drilling operations, a licensed well driller or a person supervised by a licensed well driller must act in accordance with all other relevant legislative obligations and policies.

2. Other legislative obligations

2.1 In undertaking well drilling operations, a licensed well driller or a person supervised by a licensed well driller must act in accordance with all other relevant legislative obligations and policies including obligations under the:

- *Environment Protection Act 1993*
- *Environment Protection (Water Quality) Policy 2015*
- *River Murray Act 2003*

2.2 The above list is not exhaustive and there may be other relevant legislative obligations that must be complied with.

2.3 It is the responsibility of the individual licensed well driller to keep up to date with relevant legal obligations.

PART B: Directions of the Chief Executive

I, John Schutz, being the Chief Executive of the Department for Environment and Water, direct that:

Direction 1: Keeping and producing records

Pursuant to Regulation 25(a) and (b) of the Regulations and unless otherwise directed by me or my Delegate:

1.1 A licensed well driller must complete a well completion report upon the completion of each activity authorised by the well permit. This information may be used to assess compliance with the conditions of the well permit and is entered into the state groundwater database.

1.2 If multiple well drilling operations result from unsuccessful well drilling attempts, a well completion report is required for each unsuccessful well drilling operation.

1.3 Within 30 days of the completion of a well, the licensed well driller must produce:

- the completed well completion report, and
- any strata and water samples collected (if required by the well permit), and
- a map showing the location of the well as close as possible to its actual location, and in any event to an accuracy of not more than 50 meters from its actual location or the GPS coordinates of the well on the form.

These items are to be submitted to the Department for Environment and Water, via the online Well Completion Report form (https://www.environment.sa.gov.au/topics/water/water-licences-and-permits/well-drilling) or using the contact details below.

1.4 The licensed well driller must retain a copy of the well completion report for a period of five years from the date of submission of the report to the Department for Environment and Water.

1.5 Where the licensed well driller or well permit holder wishes to conduct well drilling operations in a manner other than in accordance with my directions, the proposal must be discussed with the Drilling Inspector prior to commencement of the well drilling operations.

1.6. Contact details of the Drilling Inspector:

Address: Water Licensing Branch
Department for Environment and Water
GPO Box 1047, Adelaide SA 5001
Telephone: (08) 8463 6841 or 0428 828 569

Email: DEWDrillingInspector@sa.gov.au

1.7. Any formal proposal for a variation of the Chief Executive's Directions must be made in writing by the licensed well driller, either addressed to:

The Chief Executive c/o the Drilling Inspector
Water Licensing Branch
Department for Environment and Water
GPO Box 1047, Adelaide SA 5001
or via email to DEWDrillingInspector@sa.gov.au

Direction 2: Taking samples of water and other material

Pursuant to Regulation 25(d) of the Regulations, and unless otherwise directed by me or my Delegate:

2.1 If the well permit contains conditions that require strata samples from wells drilled, the licensed well driller must take and submit strata samples in accordance with the following:

2.2 Strata samples:

2.2.1 A strata sample of not less than 250 grams must be collected at intervals not exceeding three meters and at each change of the strata observed in the well.

2.2.2 Each strata sample must be secured in a clean sample bag or container and appropriately sealed.

2.2.3 Individual sample bags or containers must be labelled with the well permit number and the depth Interval (in metres) from which the sample was taken.

2.2.4 In the event of multiple well drilling operations being undertaken pursuant to the same permit as a result of unsuccessful well drilling attempts, the strata samples for each well must be separately identified by consecutive alphabetical letters ('A', 'B', 'C' etc) on the label.

2.2.5 Individual strata samples for a well must be packed in one box (if possible) in sequence of sample depths.

2.2.6. In the event that the licensed well driller wishes to submit samples from more than one well undertaken pursuant to more than one permit in one box, a separator inscribed with the permit number must be placed at the beginning of each sample 'run'.

2.3 If the well permit contains conditions that require water samples from wells drilled, the licensed well driller must take and submit water samples in accordance with the following:

2.3.1 A water sample of not less than 500 millilitres of water must be collected as soon as any water is cut unless the drilling method used does not permit the taking of such sample and at the completion of the well drilling operations.

2.3.2 A water sample must be collected in a clean bottle and must be appropriately sealed.

2.3.3 Water samples must be labelled with the following details:

- the well permit holder's name,
- the well permit number,
- the date the sample was collected,
- the depth from which the sample was taken (in metres),
- when the sample was taken (during drilling, development etc), and
- the name and address of the well driller responsible for the operation.

2.3.4. If the licensed well driller wishes to submit samples relating to more than one permit in one box, a separator inscribed with the permit number must be placed at the beginning of each permit sample 'run'.

Note: further information on formation sampling and water sampling can be found in Chapter 6 of the Minimum Construction Requirements (link below).

Direction 3: Well drilling operations

Pursuant to Regulation 25(e) of the Regulations and unless otherwise directed by me of my Delegate:

3.1. In undertaking well drilling operations, a licensed well driller or a person supervised by a licensed well driller must comply with the mandatory requirements of the Minimum Construction Requirements as amended from time to time.

The *Minimum Construction Requirements for Water Bores in Australia* (the Minimum Construction Requirements), fourth edition, has been developed by the National Uniform Driller Licensing Committee. This document outlines the minimum requirements for constructing, maintaining, rehabilitating and decommissioning wells in Australia and provides a consistent standard reference across Australia for the regulation of wells and well drillers.

The Minimum Construction Requirements can be located at:
http://www.waterconnect.sa.gov.au/Content/Publications/DEW/Minimum-Construction-Requirements-4th-Edition.pdf

As Chief Executive, I direct that a licensed well driller must comply with the mandatory requirements of the Minimum Construction Requirements, as amended from time to time.

In addition, licensed well drillers should have regard to the good industry practice methods and techniques recommended in the Minimum Construction Requirements.

3.2. Siting:

3.2.1. Before undertaking any well drilling operations the licensed well driller must obtain confirmation from the permit holder that the well location meets the requirements specified in the well permit.

3.3. Notification of intention to undertake well drilling operations:

3.3.1. The holder of a Class One well drillers' licence may be requested to provide notification of the intention to commence well drilling operations prior to such commencement. In such a case the licensed well driller must notify the Drilling Inspector at least 24 hours prior to commencement.

3.3.2. If a condition of the well construction permit requires a holder of a Class 2 or Class 3 drillers' licence, the licensed well driller must notify the Drilling Inspector at least 24 hours before commencement of the activity.

3.4. Notification of occurrences of artesian water:

3.4.1. All unexpected occurrences of artesian water must be immediately reported to the Drilling Inspector (contact details provided on page 5 of this document).

3.6. The following requirements apply to wells that intersect sediments of the Great Artesian Basin, in addition to the Minimum Construction Requirements, as amended from time to time:

3.6.1 Equipment, materials and follow through fluids:

All equipment and materials necessary to reasonably construct each component of the water well and to control the flow from, or between, aquifers intersected by the well, both during and after construction, must be on site at the start of the drilling activity.

This includes adequate supplies of casing, drilling fluids, fresh cement, suitable quality mixing water and adequate storage for grout mixes and follow through fluids. Adequate storage allows for the placement of grout and follow through fluids with no interruption to pumping.

The work must not commence unless the necessary equipment and materials are on site.

3.6.2 Drilling Fluids and Grout:

Unless stated otherwise, drilling fluids and grout must comply with the Minimum Construction Requirements.

As the addition of potassium chloride or other chloride-based chemicals of any kind can potentially result in corrosion of grout or casing, such chemicals must not be added to any drilling fluid used in the construction of a water well.

Calcium chloride or other chloride-based accelerants must not be added to the cement grout mix.

John Schutz
Chief Executive
Department for Environment and Water

27 July 2021

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Government of South Australia
27 July 2021

Telephone +61 (8) 8463 6876

Report prepared by:
Department for Environment and Water
Water Licensing Branch
Water and River Murray Division

Email: DEWDrillingInspector@sa.gov.au
www.environment.sa.gov.au



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Government of South Australia

Department for Environment and Water

APPEALS UNDER *LANDSCAPE SOUTH AUSTRALIA ACT 2019*

Version 4: 14 July 2020

Government of South Australia
Department for Environment and Water

Section 216 of the *Landscape South Australia Act 2019* (the Act) provides for appeals against certain decisions made by the Minister for Environment and Water under the Act. Such appeals are heard by the Environment, Resources and Development Court (the Court), which requires that all appeals must be instituted in accordance with the rules in the *Environment Resources and Development Court Rules 2003* (Court Rules).

This document has been prepared to assist you to understand how to appeal a decision made by the Minister for Environment and Water and the processes involved. To view the full Court Rules visit www.courts.sa.gov.au/ForLawyers/Pages/ERD-RulesForms-Current.aspx (Part 5 relates to appealing administrative decisions). To view the Act, visit www.legislation.sa.gov.au/LZ/C/A/LANDSCAPE%20SOUTH%20AUSTRALIA%20ACT%202019.aspx[1].

How to appeal a decision

In order to appeal a decision, you must, within six weeks of the decision you are appealing against, complete the steps outlined below.

Complete the prescribed form

In order to appeal against an administrative decision under the Act, you must complete the prescribed form. This is Form 5G - 'Appeal against an Administrative Decision'. This form will require you to:

- provide name and postal and e-mail addresses and telephone number of the Authority against whose decision the appeal is instituted (being the Minister for Environment and Water – contact details under the 'lodge the appeal' section below);
- specify the decision to which the appeal relates;
- specify the grounds of appeal against the decision;
- specify the full name and address where hard copy documents can be delivered to the applicant and, if available, the telephone number and e-mail address of the applicant.

Every application to appeal an administrative decision must have attached to it a copy of the notice of decision of the Authority which is the subject of the appeal.

Lodge the Appeal

Under section 216 of the Act, your appeal *must* be lodged with the Court within six weeks of the decision you are appealing against. This includes:

- Lodging Form 5G and paying the prescribed fee to the Court; and
- Providing a copy of Form 5G to the Minister for Environment and Water.

While the Court may extend the time to appeal, you should make every attempt to institute your appeal within six weeks.

You may lodge your appeal with the Court either by post, personal delivery or email. If you are personally delivering, you may deliver to the Court located at Sir Samuel Way Building, 241- 259 Victoria Square, Adelaide or to an alternative Country, Suburban or City Court listed at www.courts.sa.gov.au/GoingtoCourt/Pages/default.aspx.

If you are mailing or emailing your appeal, it should be addressed to:

The Registrar
Environment, Resources and Development Court
GPO Box 2465, ADELAIDE SA 5001
Email: erdcourt@courts.sa.gov.au

The prescribed fee for lodging an appeal is subject to annual review. You should contact the Court on telephone: (08) 8204 0289 to confirm the current fee and obtain advice on how to make payment. Fees can also be obtained at website: www.courts.sa.gov.au/OurCourts/ERDCourt/Pages/default.aspx. The fee *must* accompany the appeal.

A copy of Form 5G (and supporting documentation) must also be served on the Minister for Environment and Water, through their representative. You can do so by delivering it, posting or emailing to:

Minister for Environment and Water
Care of General Manager, Water Licensing Branch
Department for Environment and Water
81-95 Waymouth Street
GPO Box 1047, ADELAIDE SA 5001
Email:
DEW.WaterLicensingCorrespondence@sa.gov.au

[1] Correct as at 1 July 2020. Court rules are subject to change from time to time.

Appeal procedures

Conferences and Hearings

Once your appeal is lodged, it will be set down for a conference where all parties attend. You will be notified, in writing, of the place and time of the conference. The Commissioner of the Court will convene the conference. The purpose of the conference is to assist parties to explore a possible resolution of the matters in dispute, without resorting to a formal hearing. To that end, it is expected that:

- the matters in dispute, from the perspective of each party, will be aired and discussed openly, with a view to a fair and reasonable exchange of views in good faith;
- the parties (or their representatives) will have obtained the authority to fully discuss, negotiate and authorise a settlement of the issues in dispute, should agreement be reached; and
- each party (or their representatives) will be prepared to discuss its case, identify the issues it proposes to argue, and the grounds therefor and respond as best it can to the case of each other party.

The appeal hearing will usually be conducted in the Sir Samuel Way Building, 241- 259 Victoria Square, Adelaide. However, telephone conferencing is available or you may discuss alternative locations with the Court.

If a matter does not settle at conference, the conference will be closed and it will proceed to hearing. Anything said or done at the conference is confidential and is not admissible in proceedings before the Court, except by consent of all parties.

When an appeal proceeds to hearing, a 'bench' that the Court sees fit will sit to hear the matter (comprising a Judge and two Commissioners OR a judge or Commissioner). The Commissioner who convened the conference will not be one of the Commissioners that hears the matter.

You will be notified of the time and place of the hearing in writing.

You will be required to pay a hearing fee. This fee is subject to annual review and can be obtained by calling the Court on (08) 8204 0289 or at website: www.courts.sa.gov.au/OurCourts/ERDCourt/Pages/default.aspx.

Possible outcomes of appeal

Under section 218 of the Act the Court may, on hearing an appeal:

- confirm, vary or reverse any decision, order, direction or restriction appealed against, or substitute any decision, order, direction or restriction that should have been made in the first instance;
- refer the subject matter of the appeal to any person or body under the Act for further consideration;
- order or direct a person or body to take such action as the Court thinks fit, or to refrain (either temporarily or permanently) from such action or activity as the Court thinks fit; or
- make any consequential or ancillary order or direction, or impose any condition, that it considers necessary or expedient.

General

At both conferences and/or hearings, you may either represent yourself or you may nominate someone to represent or assist you. This person does not necessarily need to be a lawyer. If you are not representing yourself, you need to provide the name and contact details of your representative to the Court. This will assist in setting conference and/or hearing dates.

Proceedings before the Court are relatively informal. Parties who are not legally represented are given as much assistance as possible throughout the conference and hearing process. The Court's staff are able to provide advice on the procedure of the Court (but not legal advice), and throughout the conference or hearing, Court staff are available to answer any queries you may have regarding the process.

Should you have any queries regarding the lodgement of your appeal, or Court procedures, please contact:

Environment Resources and Development Court on telephone: (08) 8204 0289.

GOVERNMENT OF SOUTH AUSTRALIA

DEPARTMENT FOR ENVIRONMENT AND WATER

Mt Gambier Office | PO Box 1046 | Mt Gambier SA 5290 | [P] 8735 1134 [F] 8735 1135

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

Subject to full compliance with all the procedures, specifications and limitations contained or referred to, in the conditions set out below,

Permit No:	448573
Expiry Date:	08/09/2024

Permission is hereby granted to: GHD PTY LTD
ACN 008 488 373
LEVEL 4
211 VICTORIA SQUARE
ADELAIDE SA 5000

To undertake the following water affecting activity:

Activity: Well Construction

Well Use: Investigation

CONDITIONS:

1. The activity authorised by this permit must only be undertaken on the land described below:

   CT 5670/797
   Allotment 97 in Filed Plan 215525
   Hundred of Yongala

2. The authorised activity must be undertaken by a licensed driller.
3. If the well is considered unsatisfactory, it may be abandoned and a replacement well may then be constructed provided that the abandoned well is backfilled prior to the drill rig leaving the site.
4. The equipment, materials and methods used in drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, shall not adversely affect the quality of an underground water resource.
5. Water samples are required from all wells drilled in respect of this permit.
6. Aquifers shall be protected during drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, to prevent adverse impacts upon the integrity of the aquifer.
7. Strata samples are not required.
8. This work may be subject to inspection by the Department's Drilling Inspectors.
9. The licensed well driller must forward with the report a plan obtained from the permit holder, who must mark thereon the location of all wells drilled in respect of this permit.

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

10. If this well is incidental/ancillary to mining operations authorised under the Mining Act 1971, or a regulated activity under the Petroleum and Geothermal Energy Act 2000 (Acts), the well must be decommissioned (as outlined in the Minimum Construction Requirements for Water Bores in Australia Fourth Edition) prior to the relinquishment of the licence or lease under the associated Acts, unless alternative formal arrangements can be made with the owner or occupier of the land on which the well is located subject to approval by the relevant Minister or the Minister's agent.
11. All wells must be drilled vertical unless written permission is obtained from the Minister.
12. Activities shall not have an unacceptable detrimental impact on cultural, heritage or social values.
13. Where a well passes or will pass through two or more aquifers, an impervious seal shall be made and maintained between the aquifers to prevent leakage between the aquifers.
14. The activity must not adversely affect water-dependent ecosystems nearby.
15. The activity shall not significantly increase local drawdown.
16. The well driller must submit a Well Completion Report to the Department within 30 days of completion of each activity authorised by this well construction permit.
17. The activity shall not adversely affect the quality, quantity and accessibility of water for supply from existing wells operated by other landholders.
18. Well Construction must comply with the mandatory requirements of the Minimum Construction Requirements for Water Bores in Australia (4th Edition) and the General Specifications for Well Drilling Operations Affecting Water in South Australia (or any subsequent or related policy), as provided by the relevant authority.
19. The well subject to this permit must not be completed as an industrial water supply well unless prior approval has been obtained from the department.
20. All groundwater extracted during sampling and/or purging must be contained and disposed of in an appropriate manner to minimise risk to health and the environment.
21. Wells are to be backfilled when no longer required for ongoing monitoring and investigation purposes.
22. Due to known nearby soil/groundwater contamination in the sediments and aquifers above, caution should be taken in the drilling and/or cementing of this well(s).

NOTES:

1. It is recommended that all drilling equipment be decontaminated prior to construction of a new well or rehabilitation of an existing well to prevent the introduction or transfer of iron bacteria. Similar precautions should also be taken with pump installation equipment.
2. Under section 216(1)(b)(ii) of the Act, you have a right of appeal to the Environment, Resources and Development Court against the imposition of any condition on this permit. The appeal must be instituted within six weeks of the date of permit issue. The appeal must also be served upon this department within that time.
3. This permit is not transferable.
4. This well construction permit is not an authorisation for a person to enter private property and prior authority must be obtained from the land owner in all circumstances.

DEPARTMENT FOR ENVIRONMENT AND WATER

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PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

5. The issue of this permit does not negate the requirement to comply with the provisions of other Acts that may impact on the activity undertaken pursuant to this permit.
6. This permit is not an approval to clear native vegetation.
7. This permit does not authorise the taking of water from the well for any purpose other than testing.
8. If the extracted groundwater supply is required for human consumption, it is recommended that the water be quality tested.

TAKE NOTE that the permit holder, or a person acting on behalf of the permit holder, who contravenes or fails to comply with a condition of this permit is guilty of an offence, and such acts or ommisions may result in the variation, suspension or revocation of the permit.

Date: 08/09/2023

Sonya Knight
Senior Water Licensing Officer
Delegate of Minister for Climate, Environment and Water

GOVERNMENT OF SOUTH AUSTRALIA

DEPARTMENT FOR ENVIRONMENT AND WATER

Mt Gambier Office | PO Box 1046 | Mt Gambier SA 5290 | [P] 8735 1134 [F] 8735 1135

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

Subject to full compliance with all the procedures, specifications and limitations contained or referred to, in the conditions set out below,

Permit No:	448574
Expiry Date:	08/09/2024

Permission is hereby granted to: GHD PTY LTD
ACN 008 488 373
LEVEL 4
211 VICTORIA SQUARE
ADELAIDE SA 5000

To undertake the following water affecting activity:

Activity: Well Construction

Well Use: Investigation

CONDITIONS:

1. The activity authorised by this permit must only be undertaken on the land described below:

   CT 5670/797
   Allotment 97 in Filed Plan 215525
   Hundred of Yongala

2. The authorised activity must be undertaken by a licensed driller.
3. If the well is considered unsatisfactory, it may be abandoned and a replacement well may then be constructed provided that the abandoned well is backfilled prior to the drill rig leaving the site.
4. The equipment, materials and methods used in drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, shall not adversely affect the quality of an underground water resource.
5. Water samples are required from all wells drilled in respect of this permit.
6. Aquifers shall be protected during drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, to prevent adverse impacts upon the integrity of the aquifer.
7. Strata samples are not required.
8. This work may be subject to inspection by the Department's Drilling Inspectors.
9. The licensed well driller must forward with the report a plan obtained from the permit holder, who must mark thereon the location of all wells drilled in respect of this permit.

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

10. If this well is incidental/ancillary to mining operations authorised under the Mining Act 1971, or a regulated activity under the Petroleum and Geothermal Energy Act 2000 (Acts), the well must be decommissioned (as outlined in the Minimum Construction Requirements for Water Bores in Australia Fourth Edition) prior to the relinquishment of the licence or lease under the associated Acts, unless alternative formal arrangements can be made with the owner or occupier of the land on which the well is located subject to approval by the relevant Minister or the Minister's agent.
11. All wells must be drilled vertical unless written permission is obtained from the Minister.
12. Activities shall not have an unacceptable detrimental impact on cultural, heritage or social values.
13. Where a well passes or will pass through two or more aquifers, an impervious seal shall be made and maintained between the aquifers to prevent leakage between the aquifers.
14. The activity must not adversely affect water-dependent ecosystems nearby.
15. The activity shall not significantly increase local drawdown.
16. The well driller must submit a Well Completion Report to the Department within 30 days of completion of each activity authorised by this well construction permit.
17. The activity shall not adversely affect the quality, quantity and accessibility of water for supply from existing wells operated by other landholders.
18. Well Construction must comply with the mandatory requirements of the Minimum Construction Requirements for Water Bores in Australia (4th Edition) and the General Specifications for Well Drilling Operations Affecting Water in South Australia (or any subsequent or related policy), as provided by the relevant authority.
19. The well subject to this permit must not be completed as an industrial water supply well unless prior approval has been obtained from the department.
20. All groundwater extracted during sampling and/or purging must be contained and disposed of in an appropriate manner to minimise risk to health and the environment.
21. Wells are to be backfilled when no longer required for ongoing monitoring and investigation purposes.
22. Due to known nearby soil/groundwater contamination in the sediments and aquifers above, caution should be taken in the drilling and/or cementing of this well(s).

NOTES:

1. It is recommended that all drilling equipment be decontaminated prior to construction of a new well or rehabilitation of an existing well to prevent the introduction or transfer of iron bacteria. Similar precautions should also be taken with pump installation equipment.
2. Under section 216(1)(b)(ii) of the Act, you have a right of appeal to the Environment, Resources and Development Court against the imposition of any condition on this permit. The appeal must be instituted within six weeks of the date of permit issue. The appeal must also be served upon this department within that time.
3. This permit is not transferable.
4. This well construction permit is not an authorisation for a person to enter private property and prior authority must be obtained from the land owner in all circumstances.

DEPARTMENT FOR ENVIRONMENT AND WATER

Mt Gambier Office | PO Box 1046 | Mt Gambier SA 5290 | [P] 8735 1134 [F] 8735 1135

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

5. The issue of this permit does not negate the requirement to comply with the provisions of other Acts that may impact on the activity undertaken pursuant to this permit.
6. This permit is not an approval to clear native vegetation.
7. This permit does not authorise the taking of water from the well for any purpose other than testing.
8. If the extracted groundwater supply is required for human consumption, it is recommended that the water be quality tested.

TAKE NOTE that the permit holder, or a person acting on behalf of the permit holder, who contravenes or fails to comply with a condition of this permit is guilty of an offence, and such acts or ommisions may result in the variation, suspension or revocation of the permit.

Date: 08/09/2023

Sonya Knight
Senior Water Licensing Officer
Delegate of Minister for Climate, Environment and Water

GOVERNMENT OF SOUTH AUSTRALIA

DEPARTMENT FOR ENVIRONMENT AND WATER

Mt Gambier Office | PO Box 1046 | Mt Gambier SA 5290 | [P] 8735 1134 [F] 8735 1135

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pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

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Permit No:	448575
Expiry Date:	08/09/2024

Permission is hereby granted to: GHD PTY LTD
ACN 008 488 373
LEVEL 4
211 VICTORIA SQUARE
ADELAIDE SA 5000

To undertake the following water affecting activity:

Activity: Well Construction

Well Use: Investigation

CONDITIONS:

1. The activity authorised by this permit must only be undertaken on the land described below:

   CT 5670/797
   Allotment 97 in Filed Plan 215525
   Hundred of Yongala

2. The authorised activity must be undertaken by a licensed driller.
3. If the well is considered unsatisfactory, it may be abandoned and a replacement well may then be constructed provided that the abandoned well is backfilled prior to the drill rig leaving the site.
4. The equipment, materials and methods used in drilling, plugging, backfilling or sealing of a well, or the replacement or alteration of the casing, lining or screen of a well, shall not adversely affect the quality of an underground water resource.
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22. Due to known nearby soil/groundwater contamination in the sediments and aquifers above, caution should be taken in the drilling and/or cementing of this well(s).

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1. It is recommended that all drilling equipment be decontaminated prior to construction of a new well or rehabilitation of an existing well to prevent the introduction or transfer of iron bacteria. Similar precautions should also be taken with pump installation equipment.
2. Under section 216(1)(b)(ii) of the Act, you have a right of appeal to the Environment, Resources and Development Court against the imposition of any condition on this permit. The appeal must be instituted within six weeks of the date of permit issue. The appeal must also be served upon this department within that time.
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5. The issue of this permit does not negate the requirement to comply with the provisions of other Acts that may impact on the activity undertaken pursuant to this permit.
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7. This permit does not authorise the taking of water from the well for any purpose other than testing.
8. If the extracted groundwater supply is required for human consumption, it is recommended that the water be quality tested.

TAKE NOTE that the permit holder, or a person acting on behalf of the permit holder, who contravenes or fails to comply with a condition of this permit is guilty of an offence, and such acts or ommisions may result in the variation, suspension or revocation of the permit.

Date: 08/09/2023

Sonya Knight
Senior Water Licensing Officer
Delegate of Minister for Climate, Environment and Water



PLEASE ATTACH WELL LOCATION MAP TO THE DRILLERS REPORT

CLIENT: GHD P/L
Permit No: 448573 TO 448575 (3)
Prescribed Area: NTH
Hundred: YONGALA
Suburb: PETERBOROUGH
NRM Region/Plan: N & Y
CT 5670/767, F215525, A97 X3

Legend

- DCDB.ParcelCadastreFull
- Topo.Roads
- LANDSCAPE REGIONS
- Prescribed Wells Area
- Prescribed Watercourse

0 25 50
Meters

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Government of South Australia
Department for Environment and Water

Appendix I

Survey Results

LINKUP CONSTRUCTION SURVEYS PTY LTD

`

To: Tom Duncan
Company: GHD
Phone: 0413 476 581

From: Lincoln Jeffery
Phone: 0414 840 569
Email: Lincoln@linkupconstructionsurveys.com.au

Date: 18/10/2023

Monitoring well coordinates – Peterborough MFS

Well or Bore No.	Easting GDA20	Northing GDA20	R.L. Top of Casing A.H.D.	Natural Surface A.H.D.
MW01	298263.051	6349601.751	531.739	531.838
MW02	298261.564	6349587.210	531.772	531.860
MW03	298275.012	6349596.238	531.770	531.863

All Survey information was based from the GDA20 Z54 grid system and Australian Height Datum (AHD), Triangulated from Network Survey Marks.

Appendix J

Groundwater Purge Records

Purging and Sampling Record

Bore ID: MW01

Job Information

Client: MFS
Project: Peterborough GME
Proj. No.: 12616806
Sampler: JA/RT
Date: 27/09/23
Round

Sampling Information

Purge Method: low flow bladder pump
Sample Method:
WQ Meter Type: YSI
Flow Cell: (Y) / N Pump Depth: 13.85 m
WLevel Meter Type: Dip / Fox / Int.Fce / Gge
Field Filtered? Y / N (filter vessel, disposable filter/syringe)

Bore Information

SWL(mbTOC): 11.64 m Logic Check:
Screen: From: to: m Stick Up: m
NAPL Check: Bore Diam.: mm
Ref.datum: Well Cap Secure? Y
Bore Depth: 15.15 m

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	(.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):	-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*			
4:56	2.6	18.7	7.37	2241	4.26	127.9	11.88	CPM4	
5:01	3.2	18.6	7.35	2298	4.34	117.0	12.13		
5:04	4.4	18.6	7.35	2292	3.54	114.6	12.09		
5:07	5.6	18.6	7.35	2284	3.26	110.7	12.07		
5:10	6.8	17.9	7.33	2263	5.25	108.2	12.15		
5:13	8.0	18.6	7.35	2267	5.17	105.7	12.36		
5:16	9.2	18.6	7.35	2201	5.56	106.0	12.60		
									Pale yellow, low turbidity, low-m sediment load
									no sheen, no odour, m-h flow rate.
									V= 9.2L purged

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

*Double for gravel pack

Purging and Sampling Record

Bore ID: MW02

Job Information

Client: MFS
Project: Peterborough GME
Proj. No.: 12616306
Sampler: JA/JRT
Date: 27/09/23
Round

Sampling Information

Purge Method: low flow bladder pump
Sample Method:
WQ Meter Type: YSI
Flow Cell: Y / N Pump Depth: 13.86 m
WLevel Meter Type: Dip / Fox / Int.Fce / Gge
Field Filtered? Y / N (filter vessel, disposable filter/syringe)

Bore Information

SWL(mbTOC): 11.67 m Logic Check:
Screen: From: to: m Stick Up: m
NAPL Check: Bore Diam.: mm
Ref.datum: Well Cap Secure? Y
Bore Depth: 14.86 m

Time (24hr)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (µS/cm)	Dis.Oxygen (%)	Ox-Red Pt. (± mV)	SWL (m TOC)	(.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):	-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*			
2:31	2.0	23.9	7.52	2726	10.1	60.4	11.86	CPM4	
2:35	3.6	20.8	7.56	53.0	11.37	75.2	11.95		
2:39	5.0	20.3	7.56	2720	6.2	37.1	11.98		
2:43	6.4	20.4	7.56	2727	5.76	35.4	11.95		
2:47	7.8	20.3	7.56	2720	6.24	39.4	11.97		
									Brownish Orange, low turbidity, low-moderate sediment load, no sheen, moderate - high flow rate. V=7.8L purged

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

*Double for gravel pack

Purging and Sampling Record

Bore ID: MW63

Job Information
Client: NES
Project: 12616806
Proj. No.: Peterborough GMS
Sampler: RT/JP
Date: 27/9/23
Round

Sampling Information
Purge Method: low flow bladder pump
Sample Method:
WQ Meter Type: YSI
Flow Cell: Y / N Pump Depth: 13.02 m
WLevel Meter Type: Dip / Fox / Int.Fce / Gge
Field Filtered? Y / N (filter vessel, disposable filter/syringe)

Bore Information
SWL(mbTOC): 11.67 m Logic Check:
Screen: From: to: m Stick Up: m
NAPL Check: Bore Diam.: mm
Ref.datum: Well Cap Secure? Y
Bore Depth: 14.02 m

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	(.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):	-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*			
~~3:57~~									
4:00	2.0	18.8	7.33	2325	6.70	106.6	12.05	CPMA	
4:05	4.0	18.7	~~6.20~~ 7.32	2329	6.10	95.5	12.16		
4:09	5.2	18.6	7.28	2347	6.06	82.9	12.34		
4:11	6.4	18.6	7.30	2346	5.74	71.6	12.48		
4:14	7.6	18.5	7.31	2340	5.47	68.3	12.65		
4:17	8.8	18.6	7.31	2341	5.41	64.5	12.74		
									Yellow-Orange, low turbidity, ~~medium~~ low to moderate sediment load, no sheen, no odour, moderate-high flow. V = 8.8L purged

Field QA Checks:
Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

*Double for gravel pack

Appendix K

QAQC Report

Quality Assurance and Quality Control Report

1. GHD QA/QC Assessment

1.1 Laboratories and data set

All samples recovered during the detailed site investigation (DSI) were submitted to Eurofins, ALS and Envirolab, which are National Association of Testing Authorities (NATA) accredited laboratories, accredited to perform the required analysis.

The selected laboratories conducted all the requested analyses in accordance with the guidelines outlined in NEPM 1999 (as amended 2013).

The laboratories used for sample analysis are set out in Table 1.1.

Table 1.1 Analytical laboratories and reports

Laboratory	Primary or Secondary	NATA Certified for Analysis Requested	Report No
Eurofins	Primary	Yes	1029914 1031206 1038803
ALS	Secondary	Yes	EM2317441, EM2319399
Envirolab	Secondary	Yes	33940

The primary results for the DSI are outlined in the Tabulated Analytical Results section of the DSI report. The laboratory certificates of analysis are located in the Laboratory Reports section of the DSI report. The QAQC results for the DSI are outlined in the tables at the end of this QAQC report.

The data quality assessment detailed in the following pages refers to the data provided in these laboratory reports and the results of the QAQC analysis. Please note this QAQC report excludes results and laboratory reports from historical sampling events.

1.2 Data quality indicators

Table 1.2 sets out the QA/QC Data Quality Indicators (DQIs) used in the sampling investigation and outcomes for each of these for each DQI.

Table 1.2 Summary of QA/QC compliance for sampling

Item	Objective	Outcome	References
GHD Internal Procedures			
Comparison of field and analytical data	Agreement between visual and olfactory evidence with laboratory results	Achieved	Tabulated Analytical Results Certificates of Analysis Borelogs / Field Records
Calibration of field instruments	Meet calibration specifications	Achieved	Copies of calibration certificates.
Chain of Custody documentation	Supply Chain of Custody Documentation with all samples	Achieved	Copies of Chain of Custody Documentation.
Sample analysis and extraction holding times	Comply with holding times	Achieved	Eurofins/ALS/Envirolab Laboratory Quality Control Reports.

Item	Objective	Outcome	References
GHD Internal Procedures			
Analysis of inter- and intra-laboratory duplicate samples	Analysis of duplicate samples in 10% of primary samples	Achieved	AS4482.1-2005 and US EPA NEPM 1999 (as amended 2013) and Eurofins/ALS certificates of analysis. PFAS NEMP 2.0
Analysis of duplicate and split samples	Frequencies and RPDs within guideline and internal laboratory limits (RPD of 0-30%)	Minor non-conformances as stated in Table 2.1	AS4482.1-2005 and US EPA NEPM 1999 (as amended 2013) and Eurofins/ALS certificates of analysis. PFAS NEMP 2.0
External Laboratory Procedures			
Analysis of laboratory method blanks	No contamination of blanks	Achieved	Eurofins/ALS Laboratory Quality Control Reports.
Analysis of laboratory spike recoveries	Recoveries within the laboratory specified recovery limits	Achieved, with some minor non-conformances – see Table 3.2	Eurofins/ALS Laboratory Quality Control Reports
Analysis of laboratory internal duplicates	Frequencies and RPDs within guideline and internal laboratory limits (RPD of 0-30%)	Achieved	NEPM 1999 (as amended 2013). Eurofins/ALS Laboratory Quality Control Reports

1.3 QA/QC assessment method

Established QA/QC procedures to assess data quality were maintained throughout the project. The QA/QC program undertaken as part of the assessment by GHD included the following:

- Use of appropriately qualified and trained staff,
- Preservation of samples with ice during transport from the field to the laboratory,
- Transportation of samples with accompanying chain-of-custody documentation,
- Compliance with sample holding times,
- Review of results of blind duplicate samples,
- Review of results of split duplicate samples,
- Review of results of field blank samples,
- Review of internal analysis of laboratory duplicates, spikes and blanks.

The QC program employed during this investigation was in accordance with the general requirements set out in the Australian Standard AS4482.1 (2005) and the NEMP 2.0 (2020) QC samples provide information that discounts or potentially identifies errors due to possible sources of cross contamination, inconsistencies in sampling and analytical techniques used. The QC program completed included the collection and analysis of duplicate samples, rinsate samples and trip blank samples as described below:

- **Split duplicate samples**: These are duplicate samples split in the field, with one sample being sent to a secondary laboratory for analysis. The same parameters are analysed utilising similar analytical techniques.
- **Blind duplicate samples**: These are coded duplicate samples submitted to the primary laboratory for analysis as individual samples without any indication to the laboratory that they have been duplicated.
- **Rinsate samples**: A sample of deionised water collected from equipment used during sampling to indicate whether cross contamination occurred from equipment.
- **Trip Blanks**: A laboratory supplied uncontaminated (blank) deionised water sample which is placed within the ice chest with the samples. This sample is analysed at the laboratory to indicate if contamination occurred during transportation of samples.

A quantitative measure of the duplicate sample results was made using calculated relative percentage difference (RPD) values for each chemical. The RPD values were calculated using the following equation.

$$RPD(\%) = \frac{(C_o - C_s)}{\left(\frac{C_o + C_s}{2}\right)} \times 100$$

Where C_o = reported concentration of the chemical of interest from the original parent sample

Cs = reported concentration of the chemical of interest from the duplicate sample

2. GHD QA/QC

2.1 Duplicate samples

Elevated RPD values for duplicate and split samples are summarised in Table 2.1 and presented in full in at the end of this Appendix.

Table 2.1 Blind duplicate and split duplicate RPD exceedance summary

Primary Sample	QC Sample (Duplicate or Split)	Analyte	Primary result (mg/kg)	Duplicate Result (mg/kg)	Split result (mg/kg)	Highest RPD (%)
Soil						
MW01_4.5	FD06 (D) FS06 (S)	PFOS	0.065	0.043	0.0796	41
		Sum of PFHxS and PFOS	0.065	0.043	0.0810	41
		Sum of US EPA PFAS (PFOS + PFOA)*	0.065	0.043	-	41
		Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.065	0.043	-	41
		PFAS (Sum of Total)(WA DER List)	0.065	0.043	0.0810	41
MW03_3.0	FD04 (D) FS04 (S)	PFBS	0.0056	<0.005	0.0037	41
		PPFHxS	0.038	0.018	0.0254	71
		PFHxA	0.0071	<0.005	0.0067	35
		Sum of PFHxS and PFOS	0.038	0.018	0.0289	71
		Sum of enHealth PFAS (PFHxS + PFOS + PFOA)	0.038	0.018	-	71
		PFAS (Sum of Total) (WA DER List)	0.0507	0.018	0.0415	95
SS02	FD05 (D) FS05 (S)	PFHxS	0.022	0.019	0.0158	33
BH01_0.5	FD08 (D) FS08 (S)	PFHxS	0.0069	0.012	0.0154	76
Groundwater						
MW02	FD01 (D) FS01 (S)	Perfluoropentane sulfonic acid (PFPeS)	0.64	0.77	0.88	32
		Perfluorohexane sulfonic acid (PFHxS)	2.9	3.0	4.2	37

		Perfluorohexanoic acid (PFHxA)	1.1	1.1	1.5	31
		PFOA	0.05	0.05	0.07	33
		Sum of PFHxS and PFOS	3.42	3.51	4.8	34

2.1.1 Soil blind duplicate and split duplicate

The majority of RPDs were calculated within acceptable limits, with the exception of some PFAS analytes in 4 duplicate samples. The elevated RPDs can be attributed to the following:

– Low analyte concentrations close to or below the LOR.
– Heterogeneity of soils, particularly soils sampled within fill material.

Given the heterogeneity of soils, the majority of results being within the same order of magnitude, and the relatively minor concentrations reported for the majority of elevated RPDs, GHD considers the data set to be of an acceptable quality for which to base the assessment.

2.1.2 Water blind duplicate and split duplicate samples

The majority of RPDs were calculated within acceptable limits, with the exception of some PFAS analytes in the duplicate sample. The elevated calculated RPD was likely to be associated with low analyte concentrations close to or below the LOR.

2.1.3 Blind duplicate and split duplicate sample frequency

A summary of the blind and split duplicate sample frequency is presented in Table 2.2.

Table 2.2 Blind duplicate and split duplicate frequency summary

Primary Samples Count	Blind Duplicate Samples Count	Percentage of Primary Samples	Split Samples Count	Percentage of Primary Samples
Soil (Boreholes)				
16	4	25%	4	25%
Soil (Surface)				
4	1	25%	1	25%
Groundwater				
3	1	33.3%	1	33.3%

The QC rates for the samples satisfies the data quality objectives for this investigation as they are in general accordance with Australian Standard AS4482.1-2005 and the NEMP 2.0 (2020).

2.2 Rinsate blank

Four rinsate blank samples were collected during the DSI and analysed for PFAS. All concentrations of PFAS analytes were reported below the laboratory LOR for analyses carried out, meeting the Data Quality Objectives of the project. The tabulated results for rinsate samples are presented at the end of this Appendix.

3. Laboratory QA/QC

3.1 Internal duplicates

All RPDs for laboratory internal duplicates from the ALS and Envirolab reports were within the laboratory nominated acceptable ranges, with the exception of those presented in Table 3.1.

Table 3.1 Internal duplicate RPD outliers

Analyte	Lab report	Primary Sample	RPD (%)	RPD Limit (%)	Comment
PFOS	EM2317441	EM2317495-024	38.1	20	RPD exceeds LOR based limits
PFDA			29.1		
PFUnDA			31.9		
PFDoDA			29.0		
PFTrDA			26.1		
FOSA			38.1		
8:2 FTS			47.0		
10:2 FTS			32.2		
Sum of PFAS			38.2		
Sum of PFHxS and PFOS			37.8		
Sum of PFAS (WA DER List)			38.4		

3.2 Matrix spikes

Matrix spikes from the laboratory reports were within the acceptable ranges, with the exception of those presented in Table 3.2.

Table 3.2 Matrix spike outliers

Lab report	Analyte	Laboratory comment
EM2317441	PFOS	MS recovery not determined, background level greater than or equal to 4x spike level.
	PFDS	MS recovery not determined, background level greater than or equal to 4x spike level.
	10:2 FTS	Recovery less than lower data quality objective.

3.3 Laboratory control spikes

All laboratory control spikes from the laboratory reports were within the nominated acceptable ranges.

3.4 Method blanks

All reported method blank concentrations were less than their respective laboratory LOR and indicating that potential laboratory cross contamination was unlikely to have occurred.

3.5 Compliance with holding times

All analytes were extracted and analysed within both Eurofins' and Envirolabs' technical holding times.

3.6 Laboratory QA/QC summary

Given the relatively low number of laboratory QA/QC result outliers and the presence of matrix interference in the majority of matrix spike outliers, GHD considered the data to be of satisfactory precision on which to base the assessment.

3.7 Conclusion

Based on the QA/QC program undertaken during the sampling programs, the data obtained during the assessment is considered to be of an acceptable standard on which to base interpretations and draw conclusions regarding the environmental status of the Site.

Appendix L

Field Sheets

Daily Record Sheet

001

Client: SA MFS		Job No: 12616806	
Job Name: Peterborough DSI		Date: 22/9/23	
GHD Representative:	AK	Arrival Time: 08:30	Departure Time:
Weather Conditions:	(Please circle) (Fine) Overcast Light Rain Heavy Rain Other_____		
Works Being Undertaken:	Drilling		

Personnel/Contractor(s) Present (List all); Inducted into GHD H&SP?	Inducted	Arrival Time	Departure Time
Ian Watt			
David Watt			

Photographs Taken: (Please circle) Yes No If Yes, list below or attach photo register.

Location	Time	Record of Activities / Issues Encountered / Discussions with Client/Contractors / Sketch / Notes
22/9/23		Arrive on-site 08:30
		FD03 @ 2.5
		Drilling: MW02, BH05, BH06
		FD01@1.0, FD02@1.5 Vrefusal on hard bedrock
		-Very slow water recharge
		-Snake sighted, logged as near miss
23/9/23		Drilling: MW01, MW03
		FD06@4.5 FD04@3.0
		FD07 @ 2.0
24/9/23		Drilling: BH01, BH03, BH04
		FD08 @0.5
		- BH02 not drilled due to access issues
		Surface soil: SS01 SS02, SS03, SS04
		FD0S
		Wells purged dry after not long - unclear if fully developed

Is a Notice of Proposed Variation, Variation Order or Site Instruction Required? (Please circle) Yes No Provide Details:	
Further Inspection and/or Testing Required on above Work:	
Are there any H&S requirements to be considered for future works? Has the site been reinstated suitably (left clean and tidy)?	

Daily Record Sheet

001

Client: SAMFS		Job No: 12616806	
Job Name: Peterborough GME		Date: 27/09/23	
GHD Representative:	Josh Ander	Arrival Time: 12:40	Departure Time:
Weather Conditions:	(Please circle) (Fine) Overcast Light Rain Heavy Rain Other_____		
Works Being Undertaken:	Groundwater Monitoring		

Personnel/Contractor(s) Present (List all); Inducted into GHD H&SP?	Inducted	Arrival Time	Departure Time
Raphael Thomas			

Photographs Taken: (Please circle) Yes No If Yes, list below or attach photo register.

Location	Time	Record of Activities / Issues Encountered / Discussions with Client/Contractors / Sketch / Notes
	12:40	
	9:30	Depart GHD
	12:30	Arrive Peterborough
	1:30	MW02
		↳ FD01, FS01
		↳ RB01
	3:42	MW03
	4:40	MW01

Is a Notice of Proposed Variation, Variation Order or Site Instruction Required? (Please circle) Yes No

Provide Details:

Further Inspection and/or Testing Required on above Work:

Are there any H&S requirements to be considered for future works?
Has the site been reinstated suitably (left clean and tidy)?



Data Disclaimer

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Paper Size ISO A3

0 3 6 9 12 N

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 54

GHD

South Australian Metropolitan Fire Service
PSI/SAQP for MFS High Risk Sites

Peterborough Proposed Soil and Groundwater Sampling Locations Plan

Project No. 12602101
Revision No. B
Date 30/08/2023

FIGURE 3

\\ghdnetghd\AU\Melbourne\Projects\33\12602101\GIS\Maps\Deliverables\12602101_PeterboroughSiteLocationPlan.aprx
Print date: 30 Aug 2023 - 16:17

Data source: GHD: Site Boundary (2023); DPTI: Cadastre, Roads (2019); World Imagery: Imagery (Imagery Date: 18/12/2002; Date Extracted: 01/03/2023). Created by: ejuan

Purging and Sampling Record

Bore ID: MW01

Job Information

Client: MFS
Project: Peterborough DSI
Proj. No.: 12616.806
Sampler:
Date: 24/9/23
Round

Sampling Information

Purge Method:
Sample Method:
WQ Meter Type: YSI
Flow Cell: Y / N Pump Depth:.....m
WLevel Meter Type: (Dip) / Fox / Int.Fce / Gge
Field Filtered? Y / N (filter vessel, disposable filter/syringe)

Bore Information

SWL(mbTOC): 11.634 m Logic Check:
Screen: From: 1.5 to 1.2 m Stick Up: ..... m
NAPL Check: Bore Diam.: ..... mm
Ref.datum: Well Cap Secure?
Bore Depth: 15.460 m

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	(.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*		
									YSI not working
									pale yellow, no odour/sheen, med turb, low sed load
									purged dry after ~16L

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

*Double for gravel pack

Purging and Sampling Record

Bore ID: MW02

Job Information

Client: MFS
Project: Peterborough DSI
Proj. No.: 12616806
Sampler:
Date:
Round

Sampling Information

Purge Method:
Sample Method:
WQ Meter Type: YSI
Flow Cell: Y / N Pump Depth:.....m
WLevel Meter Type: Dip / Fox / Int.Fce / Gge
Field Filtered? Y / N (filter vessel, disposable filter/syringe)

Bore Information

SWL(mbTOC): 11.622 m Logic Check:
Screen: From: 14.5 to 11.5 m Stick Up: ..... m
NAPL Check: Bore Diam.: 50 mm
Ref.datum: Well Cap Secure?
Bore Depth: 15 m

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	(.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*		
									SWL 12.201 bottom depth 15.065
									~ 60 L purged, moderate recharge
									YSI not working

Field QA Checks:
Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

*Double for gravel pack

Purging and Sampling Record

Bore ID: MW03

Job Information	Sampling Information	Bore Information
Client: MES	Purge Method:	SWL(mbTOC): 12.562 m — Logic Check:
Project: Peterborough DSI	Sample Method:	Screen: From: 14 to 11 m — Stick Up: m
Proj. No.: 12616806	WQ Meter Type: YSI	NAPL Check: — Bore Diam.: 50 mm
Sampler:	Flow Cell: Y / N — Pump Depth: m	Ref.datum: — Well Cap Secure?
Date:	WLevel Meter Type: (Dip) / Fox / Int.Fce / Gge	Bore Depth: ~~14.8~~ 13.8 m
Round	Field Filtered? Y / N (filter vessel, disposable filter/syringe)	

Time (.....)	Volume (L)	Temp (°C)	pH (pH units)	Elec.Cond (.....)	Dis.Oxygen (.....)	Ox-Red Pt. (± mV)	SWL (m TOC)	(.....)	Comment: Colour, turbidity, sediment load, sheen, odour, flow rate, purged dry?
Stable when (3 consecutive readings):		-	*+/- 0.05 pH*	*+/- 3%*	*+/- 10%*	*+/- 10 mV*	*stable*		
									brown, high turb/sed load. no odour/ sheen
									slow recharge rate - purged dry after ~23 L. left to recharge ~10 min
									YSI not working

Field QA Checks:

Air bubbles in vials? Y / N Any violent reactions? Y / N
Decontamination as per GHD procedure? Y / N
Was sampling equipment pre-cleaned? Y / N
COC updated? Y / N

Parameters	BTEX	TPH	PAH	CHC	PCB	OCP	OPP	Tot. Metal	Biol.				
Preservatives													

Comment: Duplicate samples collected, bottles used, access, condition of headworks etc

Purge Volumes

Casing Int. Dia (mm)	50	100	150
Vol (L/m of casing)	2.0	7.9	17.7

*Double for gravel pack



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The Power of Commitment