MFS Oakden Station

Detailed Site Investigation

South Australian Metropolitan Fire Service

November 20, 2023

→ **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) for the MFS Oakden Station, located at 700 Grand Junction Road, Oakden, South Australia 5086 (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 Oakden Station in 2023 (GHD 2023a) which was subsequently used to inform the development of a preliminary conceptual site model and design of an SAQP (GHD 2023b) for implementation as part of this DSI.

Objectives

The primary objectives of the DSI are to:

– Assess the nature and extent of identified site contamination, both on- and offsite, associated with historical use of PFAS containing AFFF.
– Assess the potential risks to human health and the environment associated with identified PFAS contamination on-site, in the context of continued industrial use.
– Assess the potential risks to human health and the environment associated with PFAS contamination migrating offsite, in the context of the relevant land uses and environments.

Scope

In fulfilment of these objectives, GHD undertook, amongst others, the following tasks:

– Collection of surface soil samples from the surrounding offsite properties to the west, south and east of the site.
– Advancement of soil bores, with associated soil logging, target-depth sampling and PFAS analysis.
– Installation and development of groundwater monitoring wells.
– Sampling and analysis of groundwater samples for PFAS analytes.
– Collection of sediment samples from the drainage swale (ephemeral creek), approximately 200 m west of the site, for PFAS analysis.
– Collection of surface-dust swab samples within the fire station to assess the potential PFAS exposure risk attributable to the settlement of ambient dust containing residual PFAS constituents.
– Refinement of the Conceptual Site Model (CSM) developed for the site, comprising an assessment of PFAS source areas, pathways, and receptors.

Determination of Site Contamination

Based on the information obtained from the investigation, PFAS-impacted soil contamination hotspots exist on-site and in adjacent properties in close proximity to the site. Site contamination also exists in relation to the isolated perched groundwater beneath the site.

Conclusions

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

- PFAS impacts are noted on-site and for a limited extent offsite which can be attributed to the historical use of AFFF containing PFAS at the station.
- PFAS analytes were detected in surface soils, lower depth soils, pavers, groundwater and indoor dust deposits.
- PFAS were not detected in sediment samples collected from the nearby ephemeral creek and retention pond.
- Adequate data were obtained to delineate exceedances of adopted soil criteria both laterally and vertically.
- PFAS concentrations in on-site soils were below the adopted MFS Site-specific Health Investigation Levels (SSHILs).
- Dust swab samples collected from indoor surfaces yielded results below the adopted exposure guidelines for on-site personnel.
- PFAS results obtained from paver samples were below the adopted on-site soil PFAS assessment criteria protective of human health and the environment.
- The only locations at which exceedances of the adopted on-site soil ecological exposure criteria were reported were at BH04 (MW02) and S1. BH04 is positioned in the rear paved yard of the station, rendering the underlying soil effectively inaccessible to fauna and flora. S1 is located with an unpaved strip of land on the southern portion of the site.
- The soil investigation revealed the presence of PFAS concentrations in offsite locations which exceeded the HIL A criteria (protective of residents with gardens or accessible soil). These locations were in close proximity to the site's boundary (between 25 and 30 m).
- There were no exceedances of HIL B criteria (protective of residents with minimal opportunities for soil access) on the smaller proposed residential parcels south of the site.
- Investigations revealed the presence of localised shallow/perched groundwater extending beyond the western boundary of the site, to a distance of approximately 18 m (roughly 1,000 m^2 in total extent).
- PFAS concentrations in samples obtained from the on-site monitoring wells in this area and a temporary offsite monitoring well west of the site exceeded the adopted groundwater criteria.
- The perched water may be due to the presence of subsurface infrastructure, including irrigation and storm water systems. A site inspection by a plumber identified a leaking tap connected to the irrigation system at the site. The presence of fluoride in one sample and the relatively low salinity indicates a likely fresh water input. The significance of this leaky tap to the presence of the localized perched groundwater is unknown at this time.
- Due to the shallow nature of the PFAS-impacted groundwater – although localised in extent – root uptake of this water by trees/plants cannot be discounted. This presents a potential complete linkage from an ecological perspective.
- Although certain trees, shrubs and grasses within the prospective development area have been identified for clearance/removal to accommodate future infrastructure, it is understood that individual trees of significance will remain. At this stage, it is not known which trees and groundcover will remain, however this presents a possible complete linkage in the source-pathway-receptor ecosystem continuum. Vegetation requiring removal will require testing which will provide insight into potential ecological risks.

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:

– Additional monitoring of the isolated perched groundwater observed at the site to provide temporal information on the significance of the leaking tap to the presence of perched groundwater. Obtaining additional information on perched groundwater will facilitate a more detailed assessment of potential ecological and human health risks (e.g. root uptake by edible plants and subsequent consumption by future residents to the west of the site).
– Investigation of the migration route (if present) between the isolated perched groundwater and a potential deeper regional aquifer through the installation of a deep well (>15 m bgl).
– Perform a site-specific risk assessment to assess potential risks for a construction worker involved in the development of the proposed residences adjacent to the site. This risk assessment may include the derivation of SSHILs protective of a construction worker.
– Development of an institutional control for the on-site property to eliminate risks for a construction worker performing intrusive activities on-site (e.g., health and safety plan).
– Perform a site-specific risk assessment to further assess potential risks for future residential land use scenarios in offsite areas where residual PFAS impacted soils may exist. If it is determined that excessive risk exists, a remediation options assessment will be performed.

Limitations

This report is subject to, and must be read in conjunction with, the limitations set out in Section 1.7 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	Chain of Custody
COPC	Chemicals of Potential Concern
CSM	Conceptual Site Model
DO	Dissolved Oxygen
DQIs	Data Quality Indicators
DQOs	Data Quality Objectives
EC	Electrical Conductivity
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

Abbreviation	Full Form
JSEA	Job Safety and Environment Analysis
LDPE	Low-Density Polyethylene
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
ORP	Oxidation-Reduction Potential
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
SPR	Source-Pathway-Receptor
SWL	Standing Water Level
TDS	Total Dissolved Solids
TOC	Top of Casing
VSCAP	Voluntary Site Contamination Assessment Proposal
WQEPP	South Australian *Environmental Protection (Water Quality) Policy* 2015
µg/L	Micrograms / litre
µS/cm	Microsiemens / centimetre

Contents

Table of Abbreviations iii

1. Introduction 1

1.1 Background 1
1.2 Objectives 1
1.3 Framework 2
1.4 Scope of work 2
1.5 Person Requesting Works 2
1.6 Assumptions 3
1.7 Limitations 3

2. Site Information 4

2.1 Site Identification 4
2.2 Surrounding Land Use 4
2.3 Site Description 5
2.3.1 Site inspection and description 5
2.3.2 Historical use and storage of PFAS 5
2.4 Environmental Setting 6
2.4.1 Topography 6
2.4.2 Hydrology 6
Site drainage 6
Surface water bodies 6
2.4.3 Regional Geology 7
2.4.4 Hydrogeology 7
2.4.5 Local Groundwater Users (WaterConnect Database) 7
2.5 Proposed use for the surrounding area 8

3. Summary of historical investigations 9

3.1.1 GHD (2018) MFS Environmental Investigation Oakden Fire Station 9
3.1.2 Environmental Projects (2022) Villawood Properties Preliminary Site Investigation 10
3.1.3 Senversa (2022) Villawood Properties Detailed Site Investigation 10
3.1.4 GHD (2022) MFS 17 Fire Stations PFAS Risk Profiling 11
3.1.5 GHD (2023) MFS Oakden Preliminary Site Investigation 12
3.1.6 GHD (2023) MFS Oakden, Sampling Analysis and Quality Plan (SAQP) 12

4. Basis for assessment 13

4.1 Overview of PFAS 13
4.2 Preliminary conceptual site model 14
4.2.1 Potential Contamination Sources 14
4.2.2 Potential Exposure Pathways and Receptors 14
4.3 Assessment criteria 14
4.3.1 Soil guideline values 15
Human health criteria - Offsite areas 15
Human health criteria - On-site areas 16

4.3.2 Ecological criteria 16
4.3.3 Groundwater guideline values 17
4.3.4 Dust assessment criteria 18

5. Soil Investigation 20
5.1 Soil Sample Locations and Rationale 20
5.2 Methodology 21
5.3 Soil Analytical Program 21
5.4 Soil Sampling Results 21
5.4.1 Subsurface Conditions 21
5.4.2 Analytical Results 21
On-site 23
Offsite – East 23
Offsite – South 23
Offsite – West23
5.4.3 Distribution of PFAS Compounds in Soil 24

6. Sediment Investigation 25

7. Paver Investigation 26
7.1 Methodology 26
7.2 Analytical Results 26
7.3 Discussion 26

8. Dust Sampling 27
8.1 Scope of Work and Rationale 27
8.2 Methodology 27
8.3 Analytical Results 27
8.4 Discussion 28

9. Groundwater Investigation 29
9.1 Scope of Work and Rationale 29
9.2 Well Installation Methodology 29
9.3 Groundwater Sampling Methodology 30
9.4 Groundwater Analytical Program 30
9.5 Groundwater Investigation Results 30
9.5.1 Subsurface Conditions 30
9.5.2 Groundwater Levels and Inferred Groundwater Flow 31
9.5.3 Field Measured Water Quality Parameters 31
9.5.4 Analytical Results 32
9.6 Discussion 33
9.6.1 Distribution of PFAS Compounds in Groundwater 33

10. Quality Assurance and Quality Control 34
10.1 Internal Laboratory QA/QC 35
10.2 Field QA/QC Program 35
10.3 RPD Results 36
10.3.1 Soil and Paver 36
10.3.2 Groundwater 36

10.4 Blanks 37
10.5 Data Quality Conclusions 37
11. Screening level human health and ecological risk assessment 38
11.1 Potential Source-Pathway-Receptor Linkages 38
11.2 Potentially Complete Source-Pathway-Receptor Linkages 42
Human Health 42
Ecological 42
12. Existence of Site Contamination 43
13. Conclusions and Recommendations 43
14. References 46

Table index

Table 2.1 Summary of General Site Identification Information 4
Table 2.2 Land Uses and Zoning 4
Table 2.3 Summary of Sub-surface Geology Encountered During Intrusive Site Investigations 7
Table 4.1 Adopted PFAS Assessment Criteria – Soil 15
Table 4.2 Environmental values of particular waters (Extract from Schedule 1, Table 3 WQEPP) 17
Table 4.3 Four-step process for determining environmental values of groundwater 17
Table 4.4 Adopted PFAS Interim Screening Criteria for Groundwater 18
Table 5.1 Soil bore locations 20
Table 5.2 Summary of soil exceedances against adopted criteria 22
Table 8.1 Summary of dust swab sample results 27
Table 9.1 Relative Groundwater Levels (to AHD) 31
Table 9.2 Field measured groundwater quality parameters 31
Table 9.3 Summary of groundwater exceedances against adopted criteria 32
Table 9.4 Summary of major cations and anions 32
Table 10.1 Summary of QA/QC compliance for sampling 34
Table 10.2 Blind duplicate and split duplicate RPD exceedance summary – soil and pavers 36
Table 10.3 Blind duplicate and split duplicate RPD exceedance summary – groundwater 36
Table 11.1 CSM for PFAS exposure – SPR linkage assessment 39

Figure index

Figure 1 Oakden Site Location Plan
Figure 2 Oakden Site Layout Plan
Figure 3 Oakden Groundwater Well, Soil Bore Locations, and Surface Soil Sample Locations
Figure 4 Oakden On-site Sample Locations
Figure 5 Oakden Offsite Sample Locations

Figure 6 Oakden Soil Exceedances of Adopted Criteria
Figure 7 Sample Locations in Relation to Proposed Offsite Development
Figure 8 Oakden Groundwater Exceedances of Adopted Criteria
Figure 9 PFAS Concentration Heatmap (0.0 – 0.5 mbgl)
Figure 10 PFAS Concentration Heatmap (0.5 – 1.0 mbgl)
Figure 11 PFAS Concentration Heatmap (1.0 – 1.5 mbgl)
Figure 12 PFAS Concentration Heatmap (1.5 – 2.0 mbgl)
Figure 13 PFAS Concentration Heatmap (> 2.0 mbgl)

Appendices

Tables
Figures
Appendix A SA EPA Letter
Appendix B Photolog
Appendix C MFS Surveys
Appendix D Borelogs
Appendix E SSHILs Methodology
Appendix F Laboratory Reports
Appendix G Tabulated Analytical Results
Appendix H Well Permits
Appendix I Survey Results
Appendix J Groundwater Purge Records
Appendix K QA/QC Report

1. Introduction

GHD Pty Ltd (GHD) was engaged by the South Australian Metropolitan Fire Service (MFS) to undertake a Detailed Site Investigation (DSI) for the MFS Oakden Station ('the site'). The site is located at 700 Grand Junction Road, Oakden, South Australia 5086. The DSI investigated the nature and extent of perfluoroalkyl and polyfluoroalkyl substances (PFAS) contamination associated with the historical use of aqueous film forming foam (AFFF) at the site.

The DSI was undertaken in response to a letter provided to MFS by the SA Environment Protection Authority (EPA), referenced EPA GENI 62917 (refer to Appendix A). The letter requires that MFS develop a plan of proposed works to address MFS sites, including the Oakden site, that have been deemed the most likely to be associated with PFAS impacts that represent a risk to human health or the environment.

1.1 Background

Historically, the MFS has used AFFF containing PFAS at the site during training activities. Residual AFFF was also flushed from firefighting appliances following emergency response incidents. It is understood that the MFS commenced phasing out the use of firefighting foams containing perfluorooctane sulfonate (PFOS) in 2007 and perfluorooctanoic acid (PFOA) in 2014 after consultation with the Australasian Fire and Emergency Service Authorities Council (AFAC) and the SA EPA. The MFS replaced all firefighting foam in 2016 to ensure that only products designated fluorine-free were in use. During 2017/2018, the MFS removed all fire extinguishers containing PFAS from their inventory.

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 the above-referenced letter, dated 1 February 2023.

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

GHD understands that MFS intend to continue to operate the site as a fire station and that the land surrounding the site is currently subject to residential development, with a small commercial cluster and open space/parkland component.

1.2 Objectives

The objectives of this investigation are to:

– Assess the nature and extent, both on- and offsite, of PFAS impacts associated with historical use of AFFF.
– Assess the potential risks to human health and the environment that may be associated with the presence of PFAS on-site, in the context of continued commercial/industrial use.
– Assess the potential risks to human health and the environment that may be associated with the presence of PFAS offsite, in the context of the proposed future residential, commercial and recreational land uses and environments.

1.3 Framework

This DSI has been prepared with reference to the following legislation and guidelines:

- National Environmental Protection Council (NEPC, 1999) *National Environment Protection (Assessment of Site Contamination) Amendment Measure* 1999, as amended 2013 (the "ASC NEPM"):
- Australian and New Zealand Governments (ANZG, 2018) *Australia and New Zealand Fresh Water and Marine Water Quality Guidelines*.
- Heads of EPAs Australia and New Zealand (HEPA, 2020) *PFAS National Environmental Management Plan, over 2.0 (the "PFAS NEMP")*.
- National Health and Medical Research Council (NHMRC, 2008) *Guidelines for Managing Risks in Recreational Water*.
- Government of South Australia (2015) Environment Protection (Water Quality) Policy 2015 (the 'WQEPP'), updated 2020.
- SA EPA (2019a) *Guidelines for the Assessment and Remediation (GAR) of Site Contamination*.
- SA EPA (2019b) *Guidelines for Regulatory Monitoring and Testing – Groundwater Sampling*.
- NSW EPA (2022) *Sampling Design Guidelines for Contaminated Land*.

Fundamental to the DSI process is the development of a Conceptual Site Model (CSM), which is a description of the plausible mechanisms ('pathways'), by which people, organisms and ecosystems ('receptors') may be exposed to chemicals in the environment ('sources'). Potential risk to human health and the environment can only occur if there is a complete exposure pathway associated with a source of contamination. Conversely, exposure to PFAS is not necessarily indicative of a health or environmental risk, with this being dependent upon the nature and extent of the exposure.

1.4 Scope of work

The following scope of works was undertaken, in general, in accordance with the Sampling and Analysis Quality Plan (SAQP) (GHD 2023b):

- The collection and laboratory analysis of 15 surface soil samples (0 – 0.1 m bgl) from the adjacent offsite properties to the west, south and east of the site.
- Advancement of 65 soil bores (10 on-site and 55 offsite), with associated soil logging, target-depth sampling and PFAS analysis.
- Installation and development of three permanent on-site groundwater monitoring wells and one temporary offsite groundwater monitoring well over two drilling programs (three down-hydraulic gradient and one up-hydraulic gradient).
- Sampling and analysis of groundwater samples for PFAS analytes.
- Surveying of the four groundwater monitoring wells relative to Australian Height Datum (AHD).
- Collection of 3 offsite sediment samples from the drainage swale (ephemeral creek), approximately 200 m west of the site, for PFAS analysis.
- Collection of surface-dust swab samples within the fire station to assess the potential PFAS exposure risk attributable to the settlement of ambient dust containing residual PFAS constituents.
- Disposal of waste soil and groundwater by a licensed contractor.
- Refinement of the Conceptual Site Model (CSM), comprising an assessment of PFAS source areas, pathways, and receptors.
- Preparation of this DSI report.

1.5 Person Requesting Works

The investigation was requested by Mr Eero Haatainen, Assistant Chief Fire Officer, Metropolitan Operations – Central and Special Operations, MFS, 99 Wakefield St, Adelaide SA 5000.

1.6 Assumptions

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

- MFS will continue to operate the site as a fire station and no produce (e.g., fruit, vegetables, herbs, poultry) will be produced and consumed on-site
- The land surrounding the site will be subject to residential development, with a small commercial cluster and open space/parkland component.
- 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.

1.7 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 1.2 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.

Site conditions (including the presence of hazardous substances and/or site contamination) may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

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The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer section 1.6 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

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.

2. Site Information

2.1 Site Identification

The site is situated in the suburb of Oakden, located approximately 9.5 kilometres north-north-east of the Adelaide central business district (CBD). The nearest water course is Dry Creek located approximately 425 metres north of the site. A site location plan is presented as Figure 1, at the end of this report. The site and surrounding areas have a gradual slope to the north/north-west.

Site information details are summarised in Table 2.1 below.

Table 2.1 Summary of General Site Identification Information

Item	Detail
Site Address:	700 Grand Junction Road, Oakden, SA 5086
Certificate of Title:	CR 5759/678
Legal Description:	H10600, Section 1655 in the Area Named Oakden, Hundred of Yatala
Local Government Authority:	City of Port Adelaide Enfield
Current Zoning:	Master Planned Neighbourhood
Property Owner:	South Australian Metropolitan Fire Service
Current Site Use:	Operational Fire Station
Area:	4,802 m^2
Site Elevation:	87 m AHD

2.2 Surrounding Land Use

Land use surrounding the site is summarised in Table 2.2.

Table 2.2 Land Uses and Zoning

Orientation	Description of Land Use	Zoning (Municipal Council)
North	Grand Junction Road, Adelaide Women's Prison and Adelaide Pre-Release Centre. Dry Creek runs behind the prison facilities followed by residential properties.	General Neighbourhood Open space
East	Land to the far east and south is a mental health facility, and the former disability services centre is located further to the south-east. Vacant land in closer proximity to the site is intended for residential development.	Master Planned Neighbourhood
South		
West	The vacant land surrounding the fire station is being developed into a residential estate with green open spaces and parklands. The extent of this development is yet to be confirmed.	General Neighbourhood

2.3 Site Description

2.3.1 Site inspection and description

The site is located on Grand Junction Road, approximately 640 m west of the Walkleys Road / Sudholz Road/ Grand Junction Road intersection. Vehicle access to the site is from Grand Junction Road via a driveway along the eastern side of the station.

The site is currently used as an operational fire station. The most recent site inspection was conducted by GHD field staff, during DSI activities, on 14 September 2023. It was observed that infrastructure on-site consisted of the main building with engine bay on the northern half of the property, two storage sheds and a training tower near the southern site boundary, a former diesel underground storage tank (UST) near the eastern boundary, and a paved rear yard (including concrete wash-down slab) in the southern half of the property. Designated car parking bays are allocated in the rear yard, immediately south of the main building, adjacent to the western boundary and south of the former UST (Figure 2).

The station has a front garden with a 6 – 10 m wide unsealed strip comprising trees and shrubs along its eastern, southern and western boundaries. A water reticulation system was also observed around the station which was reportedly installed to keep sub-surface clayey soils moist and thus mitigate structural cracking in the station building.

Observations relevant to the offsite area surrounding the site can be summarised as follows:

– Earthmoving activities were observed in the vacant property to the far west of the site, as well as limited site clearance in the eastern and southern portions of the neighbouring land.
– A surface water drainage swale ending in a collection pond is evident west of the site.
– At the time of inspection, plots of land – available for purchase – were demarcated from approximately 60 m from the western boundary of the site. A 10-meter-wide utilities servitude running along the western fence line was also observed external to the site.

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

2.3.2 Historical use and storage of PFAS

A questionnaire regarding the historical use of AFFF at the site was circulated to MFS staff in 2022. Two surveys were completed; one survey was completed on 21 June 2022 by Station Officers and the second was completed by a Station Officer on 1 July 2022. Copies of the completed surveys can be found in Appendix C and the key information obtained in the surveys can be summarised as follows:

– PFAS containing AFFF was known to be used for training exercises since the opening of the station in March 1991.
– Historically, training exercises using AFFF were conducted on-site on a monthly basis, by each of the four shifts. This equated to approximately 48 training events per year.
– External drafting exercises were also undertaken up to two times a year by each shift, resulting in approximately eight of these training sessions per annum.
– Foam training reportedly occurred over the whole of the back yard of the site, partly consisting of an unsealed garden area on either side of the fence, with the remainder of the yard covered by a sealed surface. Training also occurred on the unsealed lawn area in the north-western portion of the site and on the concrete hardstand within the south-eastern section of the site.
– The volume of AFFF historically used per training exercise was estimated between 0.25 – 0.5 L. For external drafting activities, approximately 20 L was used per session.
– The stored AFFF was transferred to fire-fighting appliances by pouring concentrate directly into the foam tank for top-up, and for external drafting exercises the AFFF was transferred from its storage container to respective appliances using a Venturi Manifold.

– During the training exercises, the AFFF was generally dispersed aerially over the whole training area and possibly up to 20 m beyond the southern fence line (primarily 5 – 10 m in extent). Occasionally foam dispersed to the east and very rarely to the west of the site.
– After exercises and/or incidents involving AFFF use, appliances, equipment and tanks were washed down in the back yard and rear apron of the engine room. Formerly, there was a wash down bay installed for the fire trucks, however the date of this installation could not be established. The wash-down water was routed towards the garden or managed as stormwater and discharged offsite. Foam and wastewater from the training events either infiltrated into the ground or was discharged offsite via the public stormwater system.
– Historically, between two and four 20 L containers of AFFF concentrate were stored for training purposes on-site in the 'store' (currently utilised as a gym). Thereafter, containers were housed within the storage shed located in the southern portion of the site. Used/empty AFFF drums were subsequently returned to the Adelaide MFS Station.

2.4 Environmental Setting

2.4.1 Topography

The topography of the site and surrounding land is relatively flat and forms part of the Adelaide Plains, between Gulf St Vincent to the west, and the Mount Lofty Ranges to the east. The site sits at an elevation of approximately 87 m AHD.

2.4.2 Hydrology

Site drainage

Most of the site comprises sealed surfaces (buildings, concrete hardstand, pavers, etc.). Stormwater runoff is collected through a series of drains on-site, with the majority of stormwater discharging to offsite underground stormwater drains. The main stormwater drain is located along the sites' western boundary and discharges to the council's stormwater system in the northwest corner of the site. The stormwater system runs beneath Grand Junction Road, then along Grand Junction Road to the west and ultimately discharges to Dry Creek (Gov SA 2022).

Surface water is known to temporarily pool in certain areas of the yard during rainfall events. Stormwater has not been known to be harvested at the site.

Historically, after exercises and/or incidents involving AFFF use, appliances, equipment and tanks were washed down in the back yard and rear apron of the engine room. Subsequently, a wash down bay was installed for the trucks. The wash down water was directed towards the garden or managed as stormwater and discharged offsite.

Formerly, there was a sump (Fire Water Pump Tank) located within the eastern side of the back yard, which was filled in by 2021. The sump historically contained approximately 9,000 to 10,000 L of water which was circulated during exercises and was topped up with rainwater and mains water from appliances. MFS staff noted the occasional ingress of AFFF in the sump which gave the water a 'sudsy' appearance.

Surface water bodies

The nearest natural surface water body from the site is Dry Creek, located approximately 425 m north of the site. Dry Creek flows in a north-westerly direction and discharges to the Barker Inlet of the Gulf St Vincent, approximately 9.5 km north-west of the site.

There is what appears to be a man-made water body (retention basin from an ephemeral creek) approximately 220 m to the west of the site. This is connected to the stormwater system along Grand Junction Road.

2.4.3 Regional Geology

The GHD PSI Report (2023) indicates that the site is characterised by Pooraka Formation, consisting of clay, sand and carbonate earth; silty with gravel lenses. Most common soil classification orders were identified to Chromosols, which are characterised by outwash plains with hard alkaline red soils, small areas cracking clay soils and various alluvial soils in the stream valleys.

The site lies within a region of extremely low probability of potential acid sulphate soil (PASS) occurrence.

The geology encountered on-site during intrusive investigations was generally consistent with the regional geology and has been summarised in Table 2.3.

Table 2.3 Summary of Sub-surface Geology Encountered During Intrusive Site Investigations

Depth (m bgl)*	Soil Type	General Soil Description
0 – 0.2	Silty SAND	Fine to medium, poorly graded, reworked natural
0.2 – 1.0	Clayey SAND	Fine to medium, poorly graded, reworked natural
1.0 – 3.0	CLAY	Low to medium plasticity, natural
3.0 – 5.0	CLAY	Medium to high plasticity, natural

Note: * Approximate depths. Detailed soil borehole logs can be found in Appendix D.

2.4.4 Hydrogeology

According to the Department of Water, Land and Biodiversity Conservation (DWLBC) Report (Gerges 2006), the site lies within 'hydrogeological zone 4', which covers a large portion of the Golden Grove – Adelaide Embayment. It contains up to three Quaternary and two Tertiary aquifers, and a fractured rock aquifer. Each Tertiary aquifer consists mainly of thin layers of fine sand with low yield. Most of the Quaternary and Tertiary aquifers become thin, shallow and interconnected in the vicinity of the River Torrens. The shallow fractured rock aquifer near the River Torrens contains groundwater of low salinity and significant yield. The regional groundwater flow in the Q1 – Q3 aquifers is in north-westerly direction towards the Gulf St Vincent (Gerges 2006).

A search of the South Australian Resources Information Gateway (SARIG) database reported shallow groundwater in the vicinity of the site with standing water levels (SWL) of 5 – 10 m bgl, producing yields in the range of 0.5 – 2.5 litres/second. Groundwater salinity ranged from 1,500 – 3,000 mg/L total dissolved solids (TDS), indicating fresh to mildly brackish water.

TDS data were available for 20 wells within the 2 km radius from the site and ranged between 440 mg/L and 4,537 mg/L. Of these groundwater wells, only one had recorded TDS values below 1,200 mg/L. This well reported the lowest TDS value (440 mg/L), recorded in 1999 (well number: 6628-19941). This well is registered as a managed aquifer recharge well and has a status of not in use. It is located approximately 1.7 km south-west of the site.

2.4.5 Local Groundwater Users (WaterConnect Database)

A search of registered groundwater wells within a 2 km radius of the site was conducted using the SA WaterConnect Database in February 2023. The results of the search identified a total of 154 registered wells. Of these, 56 were listed as either backfilled, dry, abandoned or not in use. From the remaining well data, one well was identified as having a potential domestic purpose (recreation), two wells were listed for irrigation purposes and 71 wells were listed for investigation/monitoring/environmental purposes. The groundwater well potentially used for a recreational purpose is located within the sports grounds of an educational institution, approximately 510 m south of the site. The "irrigation" purpose wells are located within sports grounds of an educational institution and within a parkland/reserve, approximately 1.2 km east and 850 m south-east of the site, respectively.

2.5 Proposed use for the surrounding area

Vacant land adjacent to the MFS Oakden Fire Station (east, south and west) is currently owned by Urban Renewal Authority (Renewal SA) and comprises multiple parcels of land (measuring approximately 45.8 hectares) which are proposed to be subdivided and developed for residential and open space land uses.

At the time of reporting, earthmoving activities associated with the proposed development were progressing within the far-western portion of the land parcel identified as Stage 1 (adjacent to Fosters Road) (Senversa 2022), with residential housing plots demarcated for sale closer to the fire station. Vegetation clearance activities were also evident along the southern and eastern boundaries of the fire station. Based on the available lot sizes it is assumed that residential lots to the south of the site will likely be representative of Health Investigation Level (HIL) B land use (minimal opportunities to access soil) (NEPC 1999) and other lots to the east and west representative of HIL A (garden and accessible soil). Other areas include roads and open/space (HIL C). See Figure 2 for delineations of HIL A and HIL B representative parcels. Public open spaces representative of HIL C are the reserve lots depicted in Figure 2.

3. Summary of historical investigations

Previous PFAS investigations at the fire station and adjacent development site have been carried out by GHD and other environmental consultants between 2018 and 2023. These investigations are documented in the following reports:

– GHD (2018) *MFS Environmental Investigation*, Oakden Fire Station, Report prepared for the South Australian Metropolitan Fire Service by GHD Pty Ltd, October 2018.
– Environmental Projects (2022) *Preliminary Site Investigation, Oakden Stage 1 Development*, Report prepared for Villawood Properties Pty Ltd by Environmental Projects, February 2022.
– Senversa (2022) *Detailed Site Investigation, Oakden Redevelopment, Stage 1, Corner of Grand Junction and Fosters Roads, Oakden, South Australia*, Report prepared for Villawood Properties Pty Ltd by Senversa Pty Ltd, June 2022.
– GHD (2022) *MFS 17 Fire Stations PFAS Risk Profiling*, Report for South Australian Metropolitan Fire Service, October 2022.
– GHD (2023a) *MFS Oakden Preliminary Site Investigation,* Report for South Australian Metropolitan Fire Service, July 2023.
– GHD (2023b) *MFS Oakden Sampling Analysis & Quality Plan (SAQP),* Report for South Australian Metropolitan Fire Service, May 2023.

Locations sampled at the site as part of the above-mentioned investigations are presented in Figure 3 at the end of this report. A summary of the investigations undertaken at the site to date are detailed below.

3.1.1 GHD (2018) MFS Environmental Investigation Oakden Fire Station

The purpose of the environmental investigation undertaken at the site by GHD in 2018 was to determine if there was PFAS present within surface soils and stored water within fire-fighting appliances at the site.

During the GHD (2018) investigation, the following samples were collected and tested for PFAS:

– Two stored water samples (SW1 and SW2) were collected from the Fire Water Pump Tank at the surface (SW1) and at the deepest point of the tank at 1.5 m (SW2). It is noted that the Tank has been decommissioned and backfilled since the 2018 investigation.
– Three soil samples were collected (S1, S2 and S3) from the following locations: in the vicinity of the two on-site sheds (S1); adjacent to the former Fire Water Pump Tank (S3); and the former raised vegetable garden (S2). Samples were collected from a depth of between 0.2 and 0.3 m bgl.

The analytical results from this investigation can be summarised as follows:

– The two water samples taken from the Fire Water Pump Tank (now decommissioned) exceeded the PFAS NEMP 2.0 Health Drinking Water guideline.
– One soil sample reported a PFOS+PFHxS concentration (3.92 mg/kg) above the PFAS NEMP (HEPA 2020) HIL B value but below HIL D and the derived SS HILs.
– All soil samples reported a PFOS+PFHxS concentration above the PFAS NEMP (HEPA 2020) Interim Ecological Indirect Exposure guideline and one sample reported a PFOS+PFHxS concentration above Ecological Direct Exposure guideline.

Based on exceedances of the adopted guidelines in on-site soil samples and water samples from the Fire Water Pump Tank, this investigation concluded that potentially complete exposure pathways may exist at the site.

3.1.2 Environmental Projects (2022) Villawood Properties Preliminary Site Investigation

Environmental Projects was commissioned by Villawood Properties to undertake a Preliminary Site Investigation (PSI) for Stage 1 of the residential development of land on the corner of Grand Junction and Fosters Roads, Oakden (west of the MFS Oakden Fire Station). The objectives of the assessment were to:

– Research current and historical activities undertaken at or adjacent to the site, to identify whether potentially contaminating activities (PCAs) have occurred at or near the site (Stage 1).
– Determine whether residual chemicals from previous site use are present within surficial soils.
– Provide a desktop assessment of risk with respect to the likelihood that PCAs could have caused site contamination with respect to the proposed land use.

Based on the results of the PSI, Environmental Projects made the following conclusions regarding the area earmarked for development:

– The portion of land identified as Stage 1 of the residential development has been in use for possible grazing or broad acre cropping and has never been developed.
– Ownership has vested with various Ministers, generally associated with health.
– Soil sampling in 2010 did not identify any concentrations above the guidance levels for residential use.
– Stage 1 on-site PCAs identified as having occurred and assessed as having a negligible risk to the proposed development include agricultural use (Class 3 activity).
– Stage 1 offsite (adjacent) PCAs identified as having occurred and assessed as having a negligible risk to the proposed development include: Wetlands or detention basin (potentially) (Class 2 activity); and agricultural activities (Class 3 activity).
– Stage 1 offsite (not adjacent) PCAs identified as having occurred and assessed as having a negligible risk to the proposed development include Electrical substation (Class 2 activity).
– Other activities of environmental significance that may have occurred on Stage 1 include: general spraying of pesticides/herbicides for maintenance; and fill or soil importation (though more likely to have been rework of existing soils).

3.1.3 Senversa (2022) Villawood Properties Detailed Site Investigation

Senversa was commissioned by Villawood Properties Pty Ltd to undertake a detailed site investigation (DSI) for Stage 1 of the proposed Oakden development on the corner of Grand Junction and Fosters Roads, Oakden (west of the MFS Oakden Fire Station). The objectives of the DSI were to obtain a dataset of sufficient quantity and quality to:

– Adequately assess the presence and extent of soil contamination on and under the site and associated potential risks to human health and the environment in the context of the proposed residential and open space land uses.
– Confirm whether (or not) the soil conditions are of a quality consistent with residential and open space land uses.

The assessment indicated that a contaminated perched aquifer (reported to be discontinuous and of limited extent) was identified on the Northfield Substation site within 60 m west of the site. However, Senversa concluded the potential for the contaminated groundwater at the Northfield Substation to have migrated under the site to be unlikely – verified through the excavation of a series of test pits along the western extent of the site where no perched water was identified to a maximum depth of 3 m bgl.

The soil investigation indicated that the soil profile comprised predominantly natural soil material with some minor surficial fill material (containing anthropogenic inclusions) noted at only one location and some reworked natural material noted within the former alignment of a drainage channel – indicating that it was likely to have been in-filled with surrounding natural soil. Staining or odours were not observed during the soil investigation – with photoionisation detector (PID) concentrations detected less than 0.2 parts per million (ppm), indicating that volatile organic compounds (VOCs) are unlikely to be present in the sampled soils. The chemicals of interest (COI) in the

soil samples collected from the site during this and the previous investigations were reported at concentrations less the adopted human health and ecological investigation and screening levels.

Based on the results of this and previous investigations, Senversa concluded that Stage 1 of the proposed Oakden development is uncontaminated and suitable for its proposed future residential and open space land uses. This determination is made based on the following:

– The historical use of the site for agricultural purposes, with limited evidence of contamination sources.
– The absence of soil contamination in any of the samples collected by Senversa and others.
– The low potential for groundwater contamination under the site, based on:
    - The absence of perched groundwater.
    - The likely absence of Quaternary aquifers.
    - The thick (greater than 50m) sequence of clay between the ground surface underlying Tertiary fracture rock aquifers – which is likely to mitigate contamination from any surrounding sources (e.g. the adjacent substation).
– The low potential for soil vapour contamination, based on:
    - The absence of indicators of VOC contamination in soil.
    - The low potential for VOC (and other) contamination in groundwater.

To supplement the DSI, Senversa also conducted a soil investigation within the ephemeral creek and detention basin located within the proposed development site. Previous investigation reports indicate that the drainage channel/ephemeral creek has been in existence since approximately 1960. The concentrations of the COIs in the soil samples collected from the site were reported less the adopted human health and ecological investigation and screening levels. The results of the investigation indicated that:

– Soil contamination is not present under the site (ephemeral creek and detention basin).
– The site is suitable for its proposed future residential and open space land uses.

Note that additional soil investigation was completed by Senversa outside of the Stage 1 delineation closer to the MFS Fire Station that has not yet been published. This DSI report includes a discussion of the analytical results of soil samples collected by Senversa immediately adjacent to the fire station (east, south and west) (see Section 5.4.2).

3.1.4 GHD (2022) MFS 17 Fire Stations PFAS Risk Profiling

The MFS Oakden Fire Station was part of a 2022 desktop risk assessment and multi-criteria analysis (MCA) carried out at 17 MFS fire stations across South Australia to support appropriate risk management approaches associated with potential or identified PFAS contamination. The 17 sites requiring prioritisation, including MFS Oakden, were identified by the SA EPA in the letter GENI 62485, dated 21 October 2021.

The risk-profiling report presented the methodology and findings of the investigations for the 17 MFS fire stations with identified PFAS impacts in soil. The desktop review focused on identifying historical activities that may have represented a source of PFAS contamination, as well as potential sensitive human or ecological receptors in the vicinity of the sites. In so doing, clarity regarding the source-pathway-receptor linkages that may be present at each of the sites was acquired.

The report also provided a summary of the sites' prioritisation for further assessment based on their potential to cause harm to the environment and/or human health. The MFS Oakden Fire Station was categorised as a high priority for further investigation of PFAS contamination based on the following criteria:

– Estimated historical on-site use of AFFF concentrate.
– Depth to groundwater and risk of AFFF infiltration to groundwater.
– Distance to closest surface water body.
– Residential land use adjacent to the site (in development).

3.1.5 GHD (2023) MFS Oakden Preliminary Site Investigation

A PSI was undertaken to review historical site activities which may have contributed to PFAS contamination at the site and potential migration to offsite locations. The PSI included the following scope of works:

– Desktop assessment of site history and historical activities which may have contributed to PFAS contamination of the site and surrounds.
– Review of available information regarding local geology, hydrogeology and soil.
– A site inspection and interviews with site personnel to confirm features and historical PFAS-use areas documented in the desktop review.
– Development of a Preliminary Conceptual Site Model (PCSM) comprising an appraisal of PFAS-source areas, pathways and receptors.

The PCSM identified the following potential pathways via which people or ecological receptors could be exposed to PFAS on-site and in the surrounding offsite areas:

– Exposure of 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.
– Exposure of site users, visitors, maintenance and construction workers to PFAS via direct dermal contact with PFAS-impacted concrete paver surfaces or inhalation of contaminated dust generated from mechanical degradation of such surfaces.
– Exposure of future occupants in the proposed residential development on the land surrounding the site via direct dermal contact with contaminated soil, incidental ingestion of contaminated soil or inhalation of contaminated soil/dust from disturbed soils.
– Exposure of terrestrial fauna and flora to PFAS via direct contact with contaminated soil, ingestion of contaminated soil or bioaccumulation through indirect contact.
– Leaching of PFAS from contaminated soils or concrete paver surfaces, followed by migration through porous media into groundwater.
– Consumption of contaminated groundwater extracted offsite for domestic/drinking purposes.
– Consumption of fruit and vegetables grown offsite, where plants come into contact with contaminated soil or are irrigated with contaminated groundwater or where plant roots have access to shallow contaminated groundwater.
– Incidental ingestion of contaminated groundwater extracted offsite for recreational purposes such as filling of swimming pools.
– Exposure of freshwater aquatic life found in surface water receptors, such as Dry Creek.

The outcomes of these works are incorporated in the applicable sections of this report.

3.1.6 GHD (2023) MFS Oakden, Sampling Analysis and Quality Plan (SAQP)

Following finalisation of the PSI, a Sampling Analysis and Quality Plan (SAQP) was prepared to undertake intrusive investigations for the delineation of the lateral and vertical extent of PFAS contamination on- and offsite.

– 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 PCSM provided in the PSI, the following data gaps were identified:
    - The lateral and vertical extent of PFAS contamination in groundwater has not been determined.
    - The lateral and vertical extent of PFAS contamination in soil has not been delineated.
    - The degree of PFAS contamination in on-site concrete paver surfaces and the associated PFAS flux from these materials has not been assessed.
    - The extent of groundwater use for domestic (i.e. potable), irrigation or recreational purposes downgradient of the site remains unknown.
    - The potential for PFAS to leach from contaminated soil into groundwater has not been tested yet.

GHD recommended the following sampling and analytical program (refined to accommodate data gaps) based on the quality objectives identified in the SAQP:

- Preliminary offsite surface soil sampling program consisting of 15 surface soil samples collected from properties to the east, south and west, with the purpose of determining if surface-level soils contain PFAS at concentrations which could present a risk to human health and/or the environment.
- Soil bore investigations from 65 locations across the study area (10 on-site and 55 offsite) to enable delineation of the nature and extent of PFAS contamination in soils.
- Two samples from each location will be submitted for laboratory analysis of PFAS (Short Suite), with an anticipated total of 40 primary soil samples, plus eight QA/QC samples being analysed.
- Installation of three permanent on-site groundwater monitoring wells and one temporary offsite groundwater monitoring well (three down-hydraulic gradient and one up-hydraulic gradient).
- Following installation, a groundwater monitoring event of the three on-site wells will be conducted including:
  - Gauging of standing water levels and total well depth at all groundwater wells.
  - Sampling of on-site groundwater monitoring wells, including the collection of the required QA/QC samples.
  - Laboratory analysis of primary and QA/QC groundwater samples for PFAS with a standard limit of reporting.
- Collection of 3 offsite sediment samples from the drainage swale, approximately 200 m west of the site, for PFAS analysis.
- Collection of surface-dust swab samples within the fire station to assess the potential PFAS exposure risk attributable to the settlement of ambient dust containing residual PFAS constituents.

4. Basis for assessment

4.1 Overview of PFAS

PFAS are a large family of manufactured chemicals that have been used in Australia and around the world in a variety of commercial processes, household products and specialty applications. The physical and chemical properties of PFAS impart oil and water repellence, temperature resistance and friction reduction, making them useful to consumers and industry.

Firefighting foams containing perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) as active ingredients were once used extensively worldwide and within Australia, including at fire training facilities. Perfluorohexane sulfonate (PFHxS) was also commonly found in firefighting foam as an impurity of its manufacturing process.

Scientists have identified many individual PFAS compounds, but the individual PFAS that generally account for the majority of the PFAS mass in environmental samples include the following:

- Perfluoroalkyl sulfonates (PFSA), of which PFOS and PFHxS are the most well-studied.
- Perfluoroalkyl carboxylates (PFCA), of which PFOA is the most well-studied.
- Fluorotelomer sulfonic acids (FtS), including 8:2 FtS and 6:2 FtS.
- Perfluoroalkyl sulfonamides.

The guidelines produced by Australian environmental regulators, as detailed in Section 4.3, have focused on PFOS, PFHxS, and PFOA, which are therefore the primary focus of this DSI.

An evaluation was performed of individual PFAS compounds without available guideline values in relation to those compounds that are the focus of this DSI (PFOS, PFHxS, and PFOA). The results of this evaluation are discussed further in Section 5 (Soils) and Section 9 (Groundwater).

4.2 Preliminary conceptual site model

The following discussion is focused on the PFAS sources, pathways and receptors that are relevant to the on-site and offsite areas assessed in this DSI.

4.2.1 Potential Contamination Sources

The source of PFAS contamination at the site is associated with the historical use of AFFF which contained PFAS, prior to being phased out, including the following activities:

– Historical storage and use of PFAS-containing AFFF in training exercises.
– Washdown of equipment, trucks and appliances with drainage to stormwater and percolation through pavers.
– Historical storage/leaks of PFAS-impacted water at the former storage tank/sump.

Residual PFAS chemicals, attributable to such use, are currently evident in the soils, pavers and localised perched groundwater on site. Given PFAS are no longer used at the site all sources are considered secondary in nature.

4.2.2 Potential Exposure Pathways and Receptors

For an exposure to occur, a complete pathway must exist between a source of contamination and a receptor. Where the exposure pathway is incomplete, there is no exposure, and hence no risk. The following exposure pathways are relevant to the site:

– Consumption of contaminated groundwater.
– Consumption of edible vegetation.
– Direct dermal contact or incidental ingestion of contaminated soil, groundwater or surface runoff from impacted surfaces (pavers and concrete).
– Inhalation or ingestion of contaminated soil or dust.
– Surface runoff and groundwater transporting the contaminants offsite to the downstream and down-gradient neighbouring area.

The potential human and ecological receptors PFAS exposure emanating from the site include:

– Current and future on-site staff and visitors.
– Subsurface construction workers and maintenance workers (on-site and offsite) who come into contact with contaminated soil and/or groundwater.
– People using groundwater for domestic and drinking purposes down-gradient of the site.
– People using groundwater for irrigation of edible vegetation with which they grow produce for consumption.
– People growing edible vegetation in open soil which may interact with offsite groundwater or pore water.
– People using offsite groundwater for recreational purposes such as filling of swimming pools.
– Offsite surface water bodies, with aquatic ecosystems, where stormwater systems and/or groundwater discharge.
– On- and off- site flora and fauna.

4.3 Assessment criteria

Since PFAS is the contaminant of concern being addressed by this environmental investigation, the pertinent assessment criteria 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 (2008) *Guidelines for Managing Risks in Recreational Waters*, National Health and Medical Research Council, February 2008.
– 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.

– GHD (2023) *Derivation of Site-specific Health Investigation Levels for Urban and Regional Fire Stations – South Australian Metropolitan Fire Service (MFS)*, June 2023.

4.3.1 Soil guideline values

In accordance with the PFAS NEMP 2020 and ASC NEPM (as amended 2013), the PFAS assessment criteria listed in Table 4.1 have been adopted for the assessment of soil samples obtained from both on-site and offsite locations.

Table 4.1 Adopted PFAS Assessment Criteria – Soil

Exposure Scenario	PFHxS[1] mg/kg	PFOS[2] mg/kg	Sum of PFHxS and PFOS mg/kg	PFOA[3] mg/kg	Location	Reference Document
Metropolitan (staffed) Station	14	14	14	50	On-site	Derivation of site-specific health investigation levels for urban and regional fire stations (GHD, 2023)
Human health investigation level A (HIL A) – residential with garden/accessible soil	0.01	0.01	0.01	0.1	Offsite	PFAS NEMP (HEPA 2020)
Human health investigation level B (HIL B) – residential with limited soil contact	2	2	2	20	On-site[5]/Offsite	PFAS NEMP (HEPA 2020)
Public open space (HIL C) – parks, playgrounds, footpaths etc.	1	1	1	10	Offsite	PFAS NEMP (HEPA 2020)
Ecological indirect exposure	-	0.01	-	-	Offsite (current)	PFAS NEMP (HEPA 2020)
Ecological indirect exposure	-	0.14[4]	-	-	On-site/Offsite (future)	PFAS NEMP (HEPA 2020)
Ecological direct exposure	-	1	-	10	On-site/Offsite	PFAS NEMP (HEPA 2020)

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

Human health criteria - Offsite areas

It is understood that the offsite development will primarily incorporate a combination of the following land uses:

– Residential A (HIL A): Residential with garden/accessible soil.
– Residential B (HIL B): Residential with minimal opportunities for soil access.
– Public open space (HIL C).

The subdivided parcels immediately adjacent to the western and eastern property boundaries of the MFS Oakden Station range from 256 to 422m^2 and resemble residential dwellings incorporating gardens in the development plans provided. As such, the HIL A assessment criteria are applicable to these plots. The subdivided parcels to the south/southwest/southeast of the MFS Oakden Station are <200m^2 in size. According to the developer, these parcels will be primarily under roof or paved with a townhome built on the southern portion of the parcel and a paved driveway north of the townhome. Based on the proposed development plans and parcel sizes, HIL B assessment criteria are applicable to these areas. See Figure 2 for delineations of HIL A and HIL B representative parcels. Public open spaces representative of HIL C are the reserve lots depicted in Figure 2 and on Figure 7.

Human health criteria - On-site areas

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).

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

– The preliminary site investigations 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 the 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.

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 urban/metropolitan and regional, also referred to as “staffed” and “retained”, respectively. This letter is included in Appendix E for reference. The methodology and associated exposure assessment processes are outlined in the ASC NEPM (as amended 2013). The SSHILs have been adopted as a more representative alternative to 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.

4.3.2 Ecological criteria

The PFAS NEMP provides the following guidance in regard to potential ecological risks associated with 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 2018) *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 offsite 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. While this migration pathway is relevant to the site, it is noted that this is being assessed in the DSI via the collection of site specific groundwater data. The closest aquatic receptor is Dry Creek, which is located approximately 425 m from the site.

The soil quality guideline for offsite migration under commercial/industrial land uses considers the potential that 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. 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. Considering the current and proposed extensive development surrounding the site, and distance to the closest aquatic receptor, it is unlikely than any soil migrating from the site via erosion would be deposited in an area of significant ecological value.

4.3.3 Groundwater guideline values

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 to aquatic systems. Table 4.2 outlines the EVs for various waters as described in Schedule 1 of the EPP.

Table 4.2 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 areas[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 4.3.

Table 4.3 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 Water Connect database listed 151 registered bores located within a 2 km radius of the site. A total of 20 registered bores within the survey area had documented TDS data, ranging from 440 mg/L to 4,537 mg/L, indicating fresh to brackish water. The borehole at which 440 mg/L was recorded is designated a Managed Aquifer Recharge well.
Step 2: Assess and identify surface water bodies within a 2 km buffer of the site	The nearest natural surface water body from the site is Dry Creek, located approximately 425 m north of the site. Dry Creek flows in a north-westerly direction

Process	Assessment
	and discharges to the Barker Inlet of the Gulf St Vincent, approximately 9.5 km north-west of the site. There is what appears to be a man-made water body approximately 220 m to the west of the site. This is connected to the stormwater system along Grand Junction Road (Gov SA 2022).
Step 3: Review registered groundwater users in the Water Connect database	A review of the Water Connect database completed as part of the PSI report (GHD 2023) identified a total of 151 registered bores within a 2 km radius of the site. The identified uses of the bores with operational or unknown status were observation (2), irrigation / observation, investigation (46), monitoring (9), environmental (2), irrigation (1), environmental / recreational (1) and environmental / recharge (1).
Step 4: Application of the SA EPA recognised criteria for the most sensitive environmental value	Although unlikely, in the absence of information regarding the purpose of all groundwater wells within the study area, the use of groundwater for potable/domestic uses (incl. recreational, such as for the filling of swimming pools) cannot be discounted. The most sensitive environmental value to be applied to the site is thus PFAS NEMP 2020 Drinking Water.

Based on the assessment outlined in Table 4.3, groundwater criteria have been selected to protect the most sensitive environmental value identified for groundwater underlying the area of investigation, i.e. drinking water.

For the purpose of this investigation, 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).
– Assess the potential risk to users of groundwater for irrigation of edible vegetation. The Human Health – Drinking Water criteria have conservatively been applied to this scenario.
– Assess the potential risk to aquatic ecosystems.

The adopted groundwater screening/investigation levels, which are considered to protect potentially complete source receptor linkages, are summarised in Table 4.4.

Table 4.4 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)[4]
Human Health – Drinking Water	0.07 µg/L	0.07 µg/L	0.07 µg/L	0.56 µg/L	PFAS NEMP (HEPA 2020) ADWG (2022) [5]
Freshwater 95% Species Protection – Slightly to moderately modified ecosystems	0.13 µg/L	-	-	220 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

4.3.4 Dust assessment criteria

Due to the current and future construction activities in adjacent offsite areas, the following dust assessment criteria have been included to address the potential increase in exposure via direct dermal contact and ingestion of dust deposited on indoor surfaces that on-site workers/fire fighters may come into contact with. These guidelines apply to dust samples collected using surface wipe swabs from indoor areas.

EnRisks (2020) derived risk-based criteria to be protective of exposure by workers to PFAS in dust, in accordance with industry best practice and guidance. EnRisks (2020) stated that, when indoors, workers were expected to regularly touch some surfaces (and not others), where PFAS in the dust may transfer onto the skin and be dermally absorbed, or ingested when hands are placed in the mouth whilst eating or biting fingernails.

Assessment criteria for surface wipe sample results were derived to be protective of exposure by workers using the tolerable daily intake (TDI) of PFAS as defined by enHealth (2016).

EnRisks (2020) defined the risk-based PFAS criteria for dust surface wipe samples as follows:

– PFOS + PFHxS = 0.7 µg/100 cm^2
– PFOA = 5 µg/100 cm^2

It should be noted that while the criteria are not designed specifically for air conditioner filters, samples collected from these appliances would represent a more concentrated source of dust than the surfaces that workers would typically be exposed to within the building (e.g. eating surfaces, living room furniture). The filter samples are therefore expected to be representative of a worst-case exposure scenario.

5. Soil Investigation

5.1 Soil Sample Locations and Rationale

The soil investigation works described in this section were conducted between 14 July and 5 September 2023 under the supervision of an experienced GHD environmental professional. A total of 15 surface soil samples (SS01 – SS15) were collected from the east, south and west of the site. 65 bores (BH01 to BH65) were drilled as part of the soil investigation. The investigation locations are shown on Figure 3. A description of the soil bore locations is provided in Table 5.1 below.

Table 5.1 Soil bore locations

Proposed Soil Bore ID	Location Description
BH01*	On-site, background sample from area unlikely to be impacted by historical PFAS use.
BH02*	On-site, background sample from area unlikely to be impacted by historical PFAS use.
BH03*	On-site, adjacent to historical training area in garden bed.
BH04*	On-site, in vicinity of washdown bay, adjacent to stormwater drain.
BH05*	On-site, within western portion of the historical training area.
BH06*	On-site, south of historical training area, within footprint of former AFFF concentrate storage area.
BH07*	On-site, north of concrete washdown pad.
BH08*	On-site, within southern portion of historical training area, adjacent to southern fence line.
BH09 – BH13**	Offsite, adjacent to western fence line, within strip of land utilised as utilities/services servitude.
BH14 – BH23**	Offsite, west of site in proposed Stage 1 residential development footprint.
BH24 – BH32**	Offsite, south of site in prospective future residential development footprint.
BH33 – BH47**	Offsite, east of site in prospective future residential development footprint.
BH48 – BH56*	Offsite, west of site in proposed Stage 1 residential development footprint. Progressed to deeper depth for vertical delineation of PFAS soil impacts.
BH57 – BH58*	On-site, western boundary of site. Progressed to deeper depth for vertical delineation of PFAS soil impacts.
BH59 – BH62*	Offsite, east of site in prospective future residential development footprint. Progressed to deeper depth for vertical delineation of PFAS soil impacts.
BH63 – BH65*	Offsite, south of site in prospective future residential development footprint. Progressed to deeper depth for vertical delineation of PFAS soil impacts.

Notes: *Advanced by means of push-tube borehole technique.
**Advanced by means of hand auger.

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 a total area of approximately 24,000 m^2.

5.2 Methodology

The soil investigation conducted as part of the DSI comprised the following aspects:

– Prior to any intrusive works being undertaken, a review of Before You Dig plans was conducted and all investigation locations were cleared for underground services by an accredited service locator (Veris Australia Pty Ltd) to ensure safe drilling conditions.
– Soil bores were advanced by means of hand auger or utilising an Eziprobe drill rig (push-tube drilling technique), operated by WB Drilling Pty Ltd. Where required, concrete pavers were cored to access the underlying soil media.
– Where push-tube drilling was employed, high density polyethylene (HDPE) core liners were used to retrieve soil cores to minimise the risk of PFAS cross-contamination.
– The hand auger was decontaminated prior to use and between bore locations to prevent cross contamination. Decontamination of the hand auger involved scrubbing in a phosphate-free Liquinox solution and potable water, followed by a rinse with de-ionised water.
– Soils recovered from each soil bore were logged by an experienced GHD environmental professional to assess the underlying geology and contaminant indicators in accordance with AS 1726:2017.
– 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 samples. Soil samples were placed in laboratory-supplied sampling jars suitable for PFAS analysis.
– Soil samples were stored under chilled conditions in an esky and transported to analytical laboratories under chain of custody documentation.

5.3 Soil Analytical Program

The analytical laboratories used for the soil investigation were Eurofins (primary laboratory) and ALS Laboratory Group (ALS) (secondary laboratory). Both laboratories are registered by the National Association of Testing Authorities (NATA) and the analyses conducted were within their NATA registration.

Initially, two samples from each location were submitted for laboratory analysis of PFAS (Extended Suite). Additional samples were subsequently analysed for the vertical delineation of PFAS soil impacts. This resulted in the analysis of 128 primary soil samples (including those obtained from bores advanced for groundwater monitoring wells) and 19 duplicate pairs as part of QA/QC protocol. A further discussion of the quality assurance (QA) and quality control (QC) procedures undertaken is presented in Section 10.

5.4 Soil Sampling Results

5.4.1 Subsurface Conditions

Subsurface conditions encountered during the soil investigation were as follows:

– Reworked natural material was predominantly encountered at the surface (0 – 0.2 m bgl) and near-surface (0.3 – 0.5 m bgl) of locations assessed. This material generally comprised sandy silt or clayey sand.
– Fill material (primarily gravelly sand or sand) was noted beneath the on-site paver surface to depths ranging from (0.08 – 0.55 m bgl).
– No evidence of staining or the presence of any distinguishable olfactory odours were noted during sampling.
– Natural soil (predominantly clay) was encountered at all soil bore locations at greater depths.

Additional details of the lithological layers observed during the soil sampling program can be found in Appendix D.

5.4.2 Analytical Results

The laboratory certificates of analysis are contained in Appendix F. Results of the soil sample analyses are summarised in the analytical results tables contained in Appendix G. Analytical results exceeding the adopted

PFAS assessment criteria protective of human health and the environment are presented in Table 5.2. Soil analytical results are displayed on Figure 6 and as concentration “heat maps” for specified depth intervals on Figures 9 through 13.

In order to provide a comprehensive review of soil characterisation at the site, the table below includes analytical results from soil samples collected by GHD from 2018 through 2023 and by Senversa in 2022 and 2023. Samples collected by Senversa include test pit samples TP121 through TP241.

Table 5.2 Summary of soil exceedances against adopted criteria

Location	Approximate Distance from Site Boundary (metres)	Depth (metres)	PFHxS (mg/kg)	PFOS (mg/kg)	Sum of PFHxS and PFOS (mg/kg)
On-site					
S1	-	0.0-0.2	0.135	3.79	3.92
S2	-	0.0-0.3	0.002	0.0575	0.0593
S3	-	0.0-0.2	0.0045	0.0657	0.07
BH04	-	0.5-0.65	0.13	1.2	1.33
Offsite (East)					
BH36	15	0.01-0.1	<0.005	0.011	0.011
SS08	15	0.0-0.1	<0.005	0.014	0.014
Offsite (South)					
TP206	4	0.0-0.2	0.0010	0.112	0.113
		0.5-0.7	0.0070	0.126	0.133
		0.8-1.0	0.0196	0.0406	0.0602
TP207	4	0.0-0.2	0.0014	0.102	0.103
		0.3-0.5	0.0011	0.122	0.123
		0.8-1	0.0040	0.0356	0.0396
BH27	15	0.01-0.11	<0.005	0.014	0.014
SS06/BH25	10	0.0-0.1	<0.005	0.029	0.029
SS07/BH26/BH63	10	0.0-0.1	<0.005	0.041	0.041
		0.4-0.5	<0.005	0.22	0.22
		0.9-1.0	0.016	<0.005	0.016
BH64	5	0.01 -0.1	<0.005	0.17	0.17
		1.4-1.5	0.038	0.083	0.121
		1.9-2.0	0.18	<0.005	0.18
BH65	5	0.01 -0.1	<0.005	0.063	0.063
Offsite (West)					
TP122	15	0.0-0.2	<0.0002	0.0366	0.0366
		0.5-0.7	0.0007	0.013	0.0137
TP204	3	0.0-0.2	0.0002	0.0193	0.0195
SS03/BH11	5	0.0-0.1	<0.005	0.016	0.016
SS04/ BH12	5	0.0-0.1	<0.005	0.066	0.066
		0.6-0.7	0.048	0.014	0.06
BH50	15	0.01-0.1	<0.005	0.012	0.012

Notes:

Yellow depicts exceedances of: 1) PFAS NEMP 2.0 Residential with garden/accessible soil (HIL A); and/or 2) PFAS NEMP 2.0 Ecological indirect exposure criteria (On-Site/Future Offsite: 0.14 mg/kg PFOS; Current Offsite: 0.01 mg/kg PFOS).

Light Blue depicts exceedances of: 1) PFAS NEMP 2.0 Ecological direct exposure criteria and 2) PFAS NEMP 2.0 Ecological indirect exposure criteria (0.14 mg/kg PFOS for developed sites).

The concentrations of all remaining PFAS chemicals in analysed samples reported either below the LOR or below the adopted ecological and health assessment criteria. A discussion of individual PFAS compounds without criteria is included in the following section. There were no exceedances of the PFAS NEMP 2.0 Industrial/commercial criteria (HIL D) or the SSHILs for metropolitan fire station workers in any soil samples collected from the site. The locations of soil exceedances are summarised in Figure 6.

Based on the above results, the following observations are made with respect to both on-site and offsite areas:

On-site

There were no identified exceedances of the applicable human health assessment criteria (HIL D/ MFS Site Specific Criteria – Metropolitan) in on-site soil samples.

Isolated exceedances of the ecological criteria (indirect and direct exposure) were identified at locations S1 and BH04. A complete linkage between source, pathway and receptor is however highly unlikely for BH04 since the soil is beneath a sealed (paved) area. There is the potential for direct ecological exposure to S1, which is located in an unpaved area on the southern portion of the site.

Offsite – East

Since these locations are positioned in larger plots of land earmarked for residential housing, potentially with gardens and/or accessible soil, the HIL A criteria was applied to the soil samples collected east of the site. To the east of the site, concentrations of PFOS above the HIL A assessment criteria were identified near-surface at locations SS08 and BH36. The PFAS impacts appear to be delineated laterally in all directions, with the data showing concentrations in surrounding boreholes (BH34, BH37 to BH41, and BH59 to BH61) below the laboratory's LOR. Impacts have also been delineated vertically with underlying samples below the LOR.

Offsite – South

Based on the relatively small sizes of the plots of land to the immediate south of the site designated for high density residential dwellings, it is assumed that there will be minimal opportunity for soil access within these plots subsequent to development. Thus, HIL B assessment criteria were applied to the soil samples collected south of the site. To the south of the site, there were no exceedances of HIL B criteria.

The extent of PFAS impacts in soils to the south of the site is considered to be delineated laterally, with impacts extending as far south as BH27. All locations further south of BH27 (BH30 – BH32) had results below the LOR. Exceedances of the HIL A and Ecological Indirect Exposure criteria have been delineated vertically at all locations, apart from BH64. Although exceedances of these criteria up to a depth of 1.9 – 2.0 m bgl are evident, PFAS impacts are localised in extent. Considering the regional medium to high plasticity clay units at these depths, the relatively low PFAS concentrations observed at this location are unlikely to pose a significant risk to the Q1 aquifer through downward migration.

Offsite – West

Similar to plots of land to the east of the site, parcels to the west of the site are larger with a higher probability of gardens and/or accessible soils. Consequently, HIL A assessment criteria was applied to soil samples collected west of the site. To the west of the site, PFOS (and, in some instances, PFHxS) concentrations above the HIL A assessment criteria were identified at locations SS03/BH11/TP204, SS04/BH12, TP122 and BH50. Exceedances of the criteria were predominately identified within approximately 5 m of the site's western boundary. The extent of PFAS impacts in soils to the west of the site is considered to be delineated laterally, with all other locations (except for SS12 and BH51) below the LOR. Exceedances of the HIL A and Ecological Indirect Exposure criteria have been delineated vertically at all locations, with the exception of SS04/BH12. Soil samples were unable to be collected beyond 0.7 m depth at this location due to access constraints for equipment and refusal using a hand auger. It is noted however, that adjacent on-site locations BH03 and BH57 (approximately 10 m south-east) are below these criteria.

5.4.3 Distribution of PFAS Compounds in Soil

A review of the site soil data indicates that the fluorotelemer sulfonic acids and perfluoroalkyl sulfonamides were not detected in the majority of samples. In samples where these compounds were detected (e.g., on-site soil samples S1, S2, and S3), these compounds comprised less than 13% of the total reported PFAS concentration.

A breakdown of the PFSA compound distribution indicates that PFOS/PFHxS comprise the majority (>80%) of the PFSA, with the exception of samples BH-57 (1.4-1.5 m) and BH64 (2.4-2.5 m). In these samples, PFOS/PFHxS make up 72 and 79% of the total PFSA, respectively.

By comparison, total PFCA are comprised of a greater number of individual PFAS compounds. In some samples, PFOA was not detected while other PFCA were detected (at concentrations close to the laboratory reporting limit [LOR]). In the majority of samples, when PFOA was detected, one or more other PFCA were detected. In samples where PFOA was detected, PFOA comprises on average 39.7% of the total PFCA concentration.

6. Sediment Investigation

On August 24, 2023, three surface (0 – 0.1 m bgl) sediment samples (SED01 – SED 03) were collected from the base of the ephemeral creek and retention pond (dry at the time of sampling) located approximately 220 m to the west of the site. All analysed PFAS concentrations within these samples were below the LOR. The laboratory certificates of analysis are contained in Appendix F. The analytical results for sediment samples are contained in Appendix G. Soil human health and ecological guideline values are presented for qualitative purposes in the absence of sediment-specific guideline values.

7. Paver Investigation

Paver investigation works were conducted in conjunction with the soil investigation works conducted between 14 July and 5 September 2023. The aim of the works was to determine the potential for residual PFAS source into underlying soils. A total of five paver cores were drilled as part of the soil investigation from which samples were obtained (at locations BH04, BH05, BH07, MW02 and MW03).

7.1 Methodology

The following works were undertaken as part of the paver investigation:

– Concrete core and paver samples were collected from extracted cores by hand with a pair of clean nitrile gloves.
– Samples were placed into laboratory-supplied sampling jars suitable for PFAS analysis and placed in an esky and subsequently transported to analytical laboratories under chain of custody documentation protocols and chilled conditions.
– Collection of QA/QC samples including one intra-laboratory (blind) duplicate sample and one inter-laboratory (split) duplicate samples for analysis.

7.2 Analytical Results

Analytical results of the paver testing are summarised in the analytical results table in Appendix G. The NATA laboratory certificates of analysis are contained in Appendix F. With the exception of the sample obtained from BH05, PFAS analytes were detected in all the paver samples analysed.

Paver analytical results were compared to the soil human health and ecological guideline values as a conservative assessment in the absence of paver-specific guideline values. No results exceeded the adopted on-site PFAS assessment criteria protective of human health and the environment.

7.3 Discussion

It is noted that the results obtained from the paver sample are indicative of worst-case flux conditions since samples are ground prior to analysis, with constituents no longer bound within a consolidated matrix. Under routine conditions, it is unlikely that pavers would deteriorate/erode to this fine-grained state which is conducive of enhanced PFAS leaching potential and exposure. Considering results are below the adopted criteria under such circumstances, it can safely be concluded that pavers on-site do not constitute a significant risk as a PFAS source.

8. Dust Sampling

8.1 Scope of Work and Rationale

On the 25th July 2023, dust swab samples were obtained from six indoor, frequently-used locations at the site using the 100 cm^2 template provided by the laboratory and following the methodology described below (refer to Appendix B for dust swab sample locations). A total of three dust swab samples were submitted to a NATA-accredited laboratory for PFAS analysis (extended suite), obtained from: 1) The gym's split air conditioning internal unit filter/screen; 2) The TV room's HVAC air outlet vent; and 3) The kitchen's HVAC air outlet vent surface.

The objective of this sampling is to evaluate the risk of fire station personnel exposure to dust containing PFAS from contact with surfaces on which dust deposits.

8.2 Methodology

Dust swab samples were obtained using the following methodology, in accordance with the Australian Standard ASTM E1728-20 (2020) Standard Practice for Collection of Settled Dust Samples Using Wipe Sampling Methods for Subsequent Lead Determination:

– Swab sample collection using a laboratory supplied swab sampling kit consisting of sealed swabs (containing 70% isopropyl alcohol) and sterile sample containers.
– Placing a template with a surface area of 100 cm^2 over the sample location.
– Wiping of the surface of the sample location with firm pressure using 'S' strokes as indicated in ASTM E1728-20.
– Changing nitrile gloves between sample locations to prevent cross contamination.
– Storing the swab samples in individual sealed containers prior to transportation to the laboratory under chain of custody protocols.

8.3 Analytical Results

A summary of the dust swab sample results is presented in ***Table 8.1***. The laboratory certificates of analysis can be found in Appendix F.

Table 8.1 Summary of dust swab sample results

Sample ID	Location Description	PFOA (µg/100cm²)	PFOS + PFHxS (µg/100cm²)
DS01	Gym split air conditioner - screen	<0.001	<0.001
DS04	TV Room HVAC air outlet vent	<0.001	0.03
DS06	Kitchen HVAC air outlet vent surface	<0.001	0.0023

Notes:
PFAS Guidelines developed by EnRisks (2020) –
PFOA: 5 µg/100cm^2
PFOS+PFHxS: 0.7 µg/100cm^2

8.4 Discussion

Laboratory analysis of the dust collected from the swab samples all yielded results below the adopted criteria considered to be protective of exposure by personnel to PFAS in dust (developed by EnRisks [2020]), inferring negligible health risks associated with dust-entrained PFAS under current conditions. Higher PFAS results were anticipated in the gym's split air conditioning system based on proximity of the air intake unit to the former training/washdown areas and associated PFAS-impacted soils adjacent to these facilities.

It should however be noted that the sampling was conducted in the wet season when ambient dust levels are relatively low. An increase in adjacent development activities/earthmoving activities, particularly in the dry season, may be conducive to elevated ambient dust levels and consequent deposition of PFAS-containing dust particles.

9. Groundwater Investigation

The aim of the groundwater investigation was to assess the PFAS contamination status of groundwater beneath the site. The rationale and results are discussed in the sections below.

9.1 Scope of Work and Rationale

Four groundwater wells (MW01 – MW03, TW01) were installed at the site in July and August 2023 under the supervision of an experienced GHD environmental professional:

– One permanent up-hydraulic gradient well (MW02) located on-site in the southern portion of the site to enable the calculation of the local groundwater flow direction and to assess the degree of PFAS impacts to groundwater in the vicinity of former training/washdown area.
– Two permanent down-hydraulic gradient wells located on-site to the west (MW03) and north-west (MW01) of the site, respectively. These wells were installed to enable the calculation of the local groundwater flow direction and to assess whether PFAS in groundwater is migrating offsite.
– One temporary down-hydraulic gradient well (TW01) located offsite to the west of the station to assess the extent of potential PFAS groundwater impacts in the proposed development area and facilitate calculation of the groundwater flow direction.
– Survey of the four groundwater monitoring wells relative to Australian Height Datum (AHD).
– All permanent wells were installed in accordance with the Minimum Construction Requirements for Water Bores in Australia (4th Edition, NUDLC 2020).

The location of the monitoring wells is shown on Figure 8.

During the first groundwater well installation works commissioned in July 2023, attempts were made to intercept the Q1 aquifer on site. After drilling to 15 m bgl in the south-eastern portion of the site (original MW03 location) without encountering the groundwater strike, further drilling at this location was abandoned. Similarly, the original borehole designated for monitoring well MW02, was also abandoned at 5 m bgl after no groundwater was encountered up until this depth. Nevertheless, soil samples obtained from these locations were utilised in the soil investigation outlined above.

9.2 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 approximately 4 m bgl. The water strike was determined through various observations including appearance of water and changes in soil moisture content.
– 3 m PVC slotted PVC screens were installed from the base of the boreholes with solid PVC casing to the surface. This length was considered adequate to account for seasonal groundwater level variations.
– A gravel pack was installed around the screen, extending from the base to 0.5 m bgl.
– A bentonite plug was installed above the sand pack to protect the aquifer from any direct infiltration of surface water into the well screens.
– 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 decontaminated steel bailer. The bailer was decontaminated between well locations using a phosphate-free detergent and subsequently rinsed with tap water, followed by de-ionised water.

– Groundwater wells were surveyed by a licensed surveyor (Linkup Construction Surveys Pty Ltd). The survey results are included in Appendix I.

Table 9.1 below presents a summary of the construction details along with survey details (elevation) of the wells. Groundwater well construction logs are presented in Appendix D.

9.3 Groundwater Sampling Methodology

Groundwater samples were collected in accordance with GHD's standard operating procedures 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 seven days following well development to allow for the stabilisation of aquifer conditions. Groundwater sampling was conducted on the 3rd August and 14th 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.

All monitoring wells were purged and sampled using a low flow sampling technique (peristaltic 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 an esky 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.

9.4 Groundwater Analytical Program

The laboratories used for the groundwater investigation were Eurofins (primary laboratory) and ALS Laboratory Group (ALS) (secondary laboratory). Both laboratories are registered by the National Association of Testing Authorities (NATA) and the analyses conducted were within their NATA registration.

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

9.5 Groundwater Investigation Results

9.5.1 Subsurface Conditions

Subsurface conditions encountered whilst drilling the groundwater monitoring wells were as follows:

– Reworked natural or fill material was encountered at the surface (~0 – 0.2 m bgl) and near-surface (~0.3 – 0.5 m bgl) of monitoring wells located in the garden beds (MW01 and MW03/BH58). This material generally comprised sandy silt or clayey sand.

– Fill material (sand) was noted beneath the on-site paver surface in location MW02/BH04 (0.08 – 0.4 m bgl).
– No evidence of staining or the presence of any distinguishable olfactory odours were noted during sampling.
– Natural soil (predominantly medium to high plasticity clay) was encountered at all monitoring well locations at greater depths.

Groundwater well drilling logs are presented in Appendix D.

9.5.2 Groundwater Levels and Inferred Groundwater Flow

Groundwater levels in the wells were gauged from the marked point on the well casing on the 3rd August and 14th September 2023 using an electronic interface water level meter during the groundwater monitoring events. The groundwater gauging sheets are attached in Appendix J. Groundwater levels are presented in Table 9.1.

Table 9.1 Relative Groundwater Levels (to AHD)

Well ID	Surveyed top of casing (m AHD)	Surveyed Ground Level (m AHD)	Depth to Groundwater (m bTOC)	Relative groundwater level (m AHD)
MW01	81.343	81.401	1.735	79.608
MW02 (BH04)	81.471	81.558	1.033	80.438
MW03 (BH58)	81.588	81.752	1.170	80.418
TW01 (BH49)	80.945	80.547	1.439	79.506

Groundwater was inferred to flow in a north-westerly direction, which is consistent with the expected regional groundwater flow.

9.5.3 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 9.2.

Table 9.2 Field measured groundwater quality parameters

Well ID	Date Sampled	Temp (°C)	pH	Dissolved oxygen (mg/L)	Oxidation-reduction potential (mV)	Electrical conductivity (µS/cm)
MW01	03/08/2023	18.5	7.54	1.64	-14.4	3,216
	14/09/2023	19.8	6.92	0.65	-102.3	13,921
MW02 (BH04)	03/08/2023	18.3	6.81	2.88	419.2	2,514
	14/09/2023	18.9	7.08	1.12	37.9	7,612
MW03 (BH58)	14/09/2023	16.8	7.71	0.51	51.6	1,989
TW01 (BH49)	14/09/2023	19.9	7.79	1.39	102.6	6,994

The above field parameters are indicative of the following:

– The shallow groundwater encountered at the site is neutral with pH ranging between 6.81 and 7.79.
– The groundwater is mildly brackish to brackish with electrical conductivity values ranging between 1,989 and 13,921 µS/cm.

9.5.4 Analytical Results

A summary of exceedances of the adopted groundwater criteria is tabulated below. A summary of the groundwater exceedances are depicted in Figure 8. For detailed analytical groundwater results, please refer to Appendix G. The laboratory certificates of analysis are contained in Appendix F.

Table 9.3 Summary of groundwater exceedances against adopted criteria

Location	Approximate Distance from Western Site Boundary (metres)	Date	PFHxS (µg/L)	PFOS (µg/L)	PFOA (µg/L)	Sum of PFHxS and PFOS (µg/L)
On-site						
MW01	2	03/08/2023	0.08	0.19	0.12	0.27
		14/09/2023	0.02	0.03	0.02	0.05
MW02	17	03/08/2023	170	35	11	200
		14/09/2023	96	32	6.5	128
MW03	3.5	14/09/2023	0.04	0.04	<0.01	0.08
Offsite						
TW01	19	14/09/2023	0.95	1.0	0.07	1.95

Notes:
Blue depicts exceedances of the PFAS NEMP 2.0 Drinking Water guidelines (ADWG 2011 [v3.8 updated 2022]).
Green depicts exceedances of the PFAS NEMP 2.0 Freshwater – 95% Species Protection – Slightly to Moderately Disturbed Systems criteria.
Orange depicts exceedances of the NHMRC 2008 Recreational Use guidelines (i.e. 10x drinking water value).

In addition to the above PFAS analyses, major cation and anion analytes were also included in the testing programme. The salient parameters are presented in Table 9.4.

Table 9.4 Summary of major cations and anions

Location	Approximate Distance from Western Site Boundary (metres)	Date	Chloride (mg/L)	Fluoride (mg/L)	Sulphate (mg/L)	TDS (mg/L)	Sodium (mg/L)
On-site							
MW01	2	03/08/2023	870	<0.5	140	2,300	890
		14/09/2023	3,200	<0.5	390	5,400	2,400
MW02	17	03/08/2023	2,200	<0.5	560	3,800	1,900
		14/09/2023	1,800	<0.5	650	4,100	1,800
MW03	3.5	14/09/2023	420	<0.5	120	930	310
Offsite							
TW01	19	14/09/2023	720	1.0	190	2,200	1,100

9.6 Discussion

The borehole drilling program identified localised perched groundwater in the western portion of the investigation area, approximately 1,000 m^2 in extent. Groundwater, or saturated soil conditions within this area were encountered at depths of between 0.8 and 1.84 m bgl. As previously noted, no groundwater was encountered within deeper boreholes, advanced to depths of 5.0 – 15.0 m bgl, in the eastern and southern portions of the site. Furthermore, no groundwater was detected in the boreholes (2.5 m bgl) beyond 20 m from the site's western fence line in the prospective development area. A site investigation in 2022 by Senversa did not identify any perched water at the time of investigation.

It is noted that a stormwater drainage channel and irrigation system transect the area in which the shallow groundwater was observed. The perched water may be a result of water seeping from this infrastructure or from municipal water servicing the site. A site inspection by a plumber identified a leaking tap connected to the irrigation system at the site. The presence of fluoride in TW01 and relatively fresh (low salinity) water encountered at MW03 suggest the presence of municipal water inputs. The leaking tap was addressed on October 30, 2023. Groundwater will continue to be monitored to determine the significance of the leaking tap to the observed localized perched groundwater at the site.

Although exceedances of the adopted groundwater criteria are present, the projected yields from this constrained water source will not be supportive of sustainable utilisation for any domestic purpose, including irrigation or swimming pool filling, in the proposed residential development west of the site. Under normal circumstances, the risk of groundwater contact/ingestion by personnel on site is low to none.

As alluded to above, the regional underlying medium- to high- plasticity clay units and depth to the regional (Quaternary 1) aquifer (in excess of 15 m bgl based on current observations), likely presents an aquitard between lower hydrological units. The considerable distance of the localised, PFAS-impacted perched water to Dry Creek (approximately 425 m north of the site) also presents negligible risk to aquatic ecosystems in this moderately-disturbed water course.

9.6.1 Distribution of PFAS Compounds in Groundwater

In groundwater, the fluorotelemer sulfonic acids and perfluoroalkyl sunfonamides were not detected in the majority of samples, with the exception of 6:2 fluorotelomer sulfonate, which was detected in several wells with a maximum concentration of 0.94 µg/L in well MW02.

Multiple PFSA and PFCA compounds were detected in all groundwater samples collected from the site, in addition to those compounds that are the focus of this DSI. The primary PFSA compounds (by concentration) include perfluorobutane sulfonic acid, perfluoropentane sulfonic acid, PFHxs, and PFOS. The primary PFCA compounds (by concentration) include perfluoropentanoic acid, perfluorohexanoic acid, and PFOA.

10. Quality Assurance and Quality Control

Quality Assurance and Quality Control (QA/QC) measures for this investigation included:

– Appropriate sample labelling, preservation, storage, and transport under chain of custody procedures.
– Collection and analyses of field QA/QC samples including inter laboratory duplicate samples.
– Laboratory analyses conducted within appropriate holding times.
– Use of laboratories that hold NATA accreditation for the analyses undertaken.
– Analysis of laboratory QA/QC samples including matrix spikes, matrix spike duplicates, and surrogates.

The following sections detail the QA/QC protocol subscribed to in the investigation and considers the data quality objectives (DQOs) and data quality indicators (DQIs) (Table 10.1) developed for the field and analytical programs. The DQO process, as described in the ASC NEPM 1999 (as amended in 2013), was applied to the investigation through the implementation of an SAQP developed for the site (GHD 2023b).

Table 10.1 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, Borehole Logs and 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 internal Quality Control criteria summarised in Certificates of Analysis.
Analysis of inter- and intra-laboratory duplicate samples	Analysis of duplicate samples in 10% of primary samples	Achieved	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 10.2 & Table 10.3	PFAS NEMP 2.0.
External Laboratory Procedures			
Analysis of laboratory method blanks	No contamination of blanks	Achieved	Eurofins/ALS internal Quality Control criteria summarised in Certificates of Analysis.
Analysis of laboratory spike recoveries	Recoveries within the laboratory specified recovery limits	Achieved, with some minor deviations	Eurofins/ALS internal Quality Control criteria summarised in Certificates of Analysis.
Analysis of laboratory internal duplicates	Frequencies and RPDs within guideline and internal laboratory limits	Achieved	Eurofins/ALS internal Quality Control criteria summarised in Certificates of Analysis.

10.1 Internal Laboratory QA/QC

The results of the internal quality assurance programs of the laboratories are incorporated in the certificates of analysis in Appendix F. Internal QA/QC were reported by both laboratories as follows:

– Accuracy (laboratory spike and surrogate recovery samples) generally within 50%-150% recovery.
– Precision (measured by duplicate analysis) generally within 30% relative percentage difference.
– Minimum 95% completeness (measured by total number of analyses within acceptable limits).

The results of the internal quality assurance programs of the laboratory showed appropriate internal laboratory QA/QC was reported by both laboratories with the exception of the secondary lab (ALS) reporting some isolated matrix spike recoveries outside of the recommended acceptance criteria. Given the majority of internal laboratory QA/QC results were within acceptance limits, these minor variations are not considered to impact the overall data quality and as such are not significant in terms of this investigation.

10.2 Field QA/QC Program

Field and laboratory QC protocols were implemented as part of the sampling programs. A summary of the program is outlined below. The overall QA/QC program undertaken met the requirement of the frequency of field duplicate analyses for the main chemical of interest (PFAS), i.e. 1 per 10 analyses as recommended in the PFAS NEMP.

Field duplicate QA/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 programme included the collection and analysis of duplicate samples, as described below:

– **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.
– **Split duplicate samples:** These are duplicate samples split in the field, with one sample being sent to a secondary laboratory for analysis. The same set of parameters are analysed utilising similar analytical techniques.

A relative percentage difference (RPD) analysis of primary and blind duplicate/split duplicate samples is used to measure the representativeness and/or precision of duplicate samples. The RPD values were calculated using the following equation.

$$\text{RPD}(\%) = \frac{\langle Co - Cs \rangle}{\left\langle \frac{Co + Cs}{2} \right\rangle} \times 100$$

Where Co = concentration obtained from the original sample

Cs = concentration obtained from the duplicate sample

All primary soil samples and intra-laboratory soil duplicate samples were submitted to the primary laboratory (Eurofins). 19 intra-laboratory duplicate (blind) soil samples, 2 intra-laboratory duplicate groundwater samples and 1 intra-laboratory duplicate paver sample were analysed as part of the assessment.

In addition, the PFAS NEMP supports the use of the inter-laboratory duplicate analysis to provide information on the accuracy of the analytical data. This was achieved by dispatching the same quantity of inter-laboratory duplicate (split) soil samples to the secondary laboratory (ALS).

Validation and interpretation of the field QA/QC data was undertaken by calculating the relative percentage difference for duplicate sample pairs. Duplicate samples with an RPD below 30% are considered to have acceptable correlation. However, consideration also needs to be given to the concentrations detected. In general, should the reported concentrations be less than 10x the LOR, no RPD limit is asserted.

Results from the RPD analysis of field duplicates taken during the soil, groundwater and paver investigations are presented in the analytical results tables included in Appendix K.

10.3 RPD Results

10.3.1 Soil and Paver

The majority of the RPD results for the intra/inter laboratory field duplicates collected during the soil sampling were within the absolute 30% acceptance range, with the exception of the following RPD exceedances of analytes of concern summarised below:

Table 10.2 Blind duplicate and split duplicate RPD exceedance summary – soil and pavers

Primary Sample ID	QA/QC Sample ID	Analyte	Results			RPD %	
			Primary Result (mg/Kg)	Blind (B) Result (mg/Kg)	Split (S) Result (mg/Kg)	Blind RPD (%)	Split RPD (%)
BH02_ 0-0.1	FD04 (B) FS04 (S)	PFOS	0.11	0.082	0.0755	29	**37**
		Sum of PFHxS and PFOS	0.11	0.082	0.0798	29	**32**
MW02_ 0.08-0.2	FD06 (B) FS06 (S)	PFOS	0.0094	<0.005	0.0053	-	**56**
		Sum of PFHxS and PFOS	0.0094	<0.005	0.0057	-	**49**
MW03_ PAVER	FD05 (B) FS05 (S)	PFOS	0.083	0.059	0.124	**34**	**40**
		Sum of PFHxS and PFOS	0.129	0.094	0.171	**31**	28
BH12_ 0.6-0.7	FD02 (B) FS02 (S)	PFHxS	0.037	0.048	0.0212	26	**54**
		PFOS	0.014	0.012	0.0074	15	**62**
		Sum of PFHxS and PFOS	0.051	0.06	0.0286	16	**56**
Notes: Bold text denotes an exceedance of the RPD acceptance criteria (30%).							

The above RPD exceedances are likely due to the heterogeneity of soil and concrete matrices. Additionally, given the relatively low-level concentrations detected for PFAS compounds, the likelihood of elevated RPD values is increased. Given that all other RPD values are within the acceptable range, GHD considers the data set to be of acceptable quality for which to base this assessment.

10.3.2 Groundwater

The majority of RPD results for the intra- (blind) and inter- (split) laboratory duplicate samples collected during the groundwater sampling program were within the 30% acceptance range, with the exception of the following RPD exceedances of analytes of concern outlined below:

Table 10.3 Blind duplicate and split duplicate RPD exceedance summary – groundwater

Primary Sample ID	QA/QC Sample ID	Analyte	Results			RPD %	
			Primary Result (mg/L)	Blind (B) Result (mg/L)	Split (S) Result (mg/L)	Blind RPD (%)	Split RPD (%)
MW02	QC01B	PFOS	30	35	22	15	**31**
Notes: Bold text denotes an exceedance of the RPD acceptance criteria (30%).							

Considering the single marginal exceedance of the RPD acceptance criteria, the data set is considered of appropriate quality on which to base the assessment.

10.4 Blanks

Equipment blank (rinsate) samples were collected during the soil and groundwater investigations to indicate whether possible cross contamination may have occurred during sampling. The rinsate blank samples obtained during the soil sampling program were collected off clean push-tube liners and hand auger cutting heads prior to submission to the laboratory for PFAS full-suite analysis. The rinsate blank samples obtained during the groundwater investigation were collected from decontaminated interface probes.

Field blanks were also collected during the sampling of groundwater to assess whether contamination may have occurred in the field during sampling.

All rinsate and field blanks collected during the investigation reported PFAS concentrations below laboratory reporting limits, indicating that decontamination procedures were acceptable and cross-contamination between samples and sampling equipment did not occur.

The results of the rinsate and field blank analyses are presented in the analytical results tables included as Appendix K.

10.5 Data Quality Conclusions

Based on the results of the field QA/QC indicators above and internal laboratory quality control parameters, the data obtained during the assessment is considered to be robust and defensible on which to base interpretations and draw conclusions regarding the status of the site.

11. Screening level human health and ecological risk assessment

11.1 Potential Source-Pathway-Receptor Linkages

The potential source-pathway-receptor linkages identified for the site and surrounding offsite areas are presented in the preliminary CSM (Section 4.2). Section 5 to Section 99 present the Tier 1 screening assessment of the dataset collected by GHD from within the site and surrounding offsite areas. The tier 1 screening assessment process involves the comparison of the measured PFAS concentrations with the conservative assessment criteria.

The tier 1 screening levels are designed to be well below the concentrations at which adverse health or environmental effects could occur and therefore PFAS concentrations lower than these values are unlikely to present a risk. When exceedances of the Tier 1 screening levels are identified, the ASC NEPM also allows for an assessment of the nature and significance of the exposure pathway. Hence, the aim of the tier 1 screening process was to identify the PFAS exposure scenarios requiring more detailed (Tier 2) assessment.

The preliminary CSM developed for the site has been refined based on the outcomes of the Tier 1 screening process and is summarised in Table 11.1. Source-pathway-receptor linkages were assessed under the following categories:

– **Uncertain** – Not enough data available to indicate if a linkage is present or absent.
– **Incomplete exposure pathway** – no exposure pathway exists to the receptors.
– **Low risk** – an exposure pathway potentially exists however the exposure is considered unlikely to present an unacceptable risk to the receptor, based on the outcomes of the tier 1 screening process.
– **Potentially complete exposure pathway** – an exposure pathway may exist from the source to the potential receptor and further assessment is required. This categorisation is application to scenarios where either:
    - 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.
    - Receptors are present and PFAS impact greater than the adopted assessment criteria are shown to present at the receptor.

Table 11.1 CSM for PFAS exposure – SPR linkage assessment

Scenario	Media	Potential Receptors	Exposure Pathways	Tier 1 outcome	Comments
1a	On-site PFAS impacted soils	Site users, visitors, maintenance, and construction workers	Direct contact Incidental ingestion Inhalation of dust	**Low risk**	SSHILs have been derived using exposure assumptions that reflect the typical usage pattern of the MFS fire stations. PFAS concentrations in on-site soils were below these criteria. The PFAS impacts identified in on-site soil therefore represent a low risk to human users of the site. In addition, the dust swab samples collected from indoor surfaces, yielded results below the adopted exposure guidelines for on-site personnel. The health risk associated with dust exposure is therefore considered negligible. Under normal circumstances, the risk of contact with PFAS in soil by workers undertaking maintenance work on-site is low to none. Risk can be further mitigated by adopting appropriate occupational health and safety protocols when undertaking works in PFAS impacted areas.
1b		Ecosystems at the site	Direct exposure and uptake Food chain exposure	**Low risk**	The majority of the site is covered by buildings and pavers, areas of unsealed surfaces (i.e., garden beds with trees and shrubs) are limited to small areas on the site boundaries. There were exceedances of the PFAS NEMP direct soil ecological exposure criteria (1 mg/kg) in BH04 (MW02) and S1. BH04 (MW02) is positioned in the rear paved yard of the station, rendering the underlying soil effectively inaccessible to fauna and flora. S1 is located in the small unpaved strip along the southern side of the on-site property but this exceedance is considered to be of limited relevance, given the proposed ongoing use of the site as a fire station.
1c		Offsite receptors	Leaching and runoff to offsite areas	**Potentially complete exposure pathway**	The PFAS concentrations measured in BH04 and S1 were above the PFAS NEMP indirect soil ecological criteria (0.14 mg/kg), which is designed to trigger an assessment of the potential for migration. These impacts represent a potential ongoing source of impact to offsite soil (see Scenario 4a to 4d) and groundwater (see Scenario 5).
2	On-site PFAS impacted concrete pavers	Site users, visitors, maintenance, and construction workers	Direct contact Inhalation of dust	**Incomplete exposure pathway**	Exposure to PFAS in pavers by site users will be minimal given the nature of the material (solid matrix) and limited potential for ingestion/inhalation. The PFAS concentrations measured within the pavers were also below the SSHILs.
3	PFAS in shallow perched groundwater beneath the site	Maintenance, and construction workers	Contact and/or incidental ingestion during intrusive works	**Low risk**	Investigations identified the presence of localised shallow/perched (approximately 1-2 m bgl) groundwater in the western portion of the site. PFAS concentrations in samples obtained from the monitoring wells in this area exceeded the screening levels for recreational water use. Under normal circumstances, the risk of inadvertent groundwater contact/consumption by personnel/maintenance workers on site is low. Risk can be further mitigated via de-watering before performing works within a trench and adopting appropriate occupational health and safety protocols.

4a	Offsite PFAS impacted soils	Maintenance, and construction workers	Direct contact Incidental ingestion Inhalation of dust	**Potentially complete exposure pathway**	The proposed residential development on the adjacent parcels where PFAS was identified in surficial and subsurface soils will include removal of top soils, cut and fill activities as well as the installation of footers and services/utilities resulting in the displacement of soils. The PFAS NEMP does not provide assessment criteria specific to intrusive workers. Additional assessment and/or management (e.g., via occupational health and safety protocols) of the potential exposures that may occur during these kinds of activities isis therefore warranted.
4b		Offsite future residential occupants	Direct contact Incidental ingestion Uptake through edible vegetation or biota Inhalation of dust	**Potentially complete exposure pathway**	The soil investigation revealed the presence of PFAS concentrations in offsite locations which exceeded the low-density residential assessment criteria (i.e., HIL A) but not the high-density residential criteria (i.e., HIL B). These locations were in close proximity to the site; within approximately 30 m of the southern boundary, 25 m from the eastern boundary, and 25 m from the western boundary. GHD understands that some of the impacted soil will be removed during the site development process. Additional consideration of the potential exposures that may occur within the future residential properties following development is warranted. This assessment should consider: – The development plans and whether the impacted lots will be low or high density residential – The potential risk posed by any residual soil impacts present after soil is removed during development – The potential requirement for remediation or management of any residual impacts
4c		Offsite future users of public open space	Direct contact Incidental ingestion Dust inhalation	**Low risk**	The PFAS concentrations measured in the soil samples collected from the offsite areas were below the assessment criteria for public open space (i.e., HIL C). The PFAS impacts identified in offsite soil would therefore represent a low risk to human users of future open space areas.
4d		Ecosystem surrounding the site	Direct contact Ingestion Food chain exposure	**Low risk**	The PFAS concentrations measured in offsite soils were below the PFAS NEMP direct soil ecological criteria (1 mg/kg) and only a small number of samples reported PFAS concentrations above the PFAS NEMP indirect soil ecological criteria for developed sites. Given the nature of the proposed future residential development, indirect (i.e., food chain exposures to PFAS by ecological receptors) are expected to be minimal, however a review of any residual contamination with respect to the final development will be required.
5a	PFAS in shallow perched groundwater offsite	Maintenance, and construction workers	Contact and/or incidental ingestion of during intrusive works	**Potentially complete exposure pathway**	Investigations revealed the presence of localised shallow/perched observed (approximately 1-2 m bgl) groundwater to the west. PFAS concentrations in samples obtained from the monitoring wells in this area exceeded the screening levels for recreational water use. Under normal circumstances, the risk of inadvertent groundwater contact/consumption by intrusive personnel/maintenance workers on site is low. Given the nature of the

					development activities, additional consideration of the risks associated with encountering perched shallow groundwater during cut and fill activities is warranted.
5b		Future residents	Consumption of deep-rooted produce interacting with perched groundwater	**Potentially complete exposure pathway**	PFAS has been identified in groundwater samples obtained from temporary monitoring well TW01 located west of the site. Due to the shallow nature of the PFAS-impacted groundwater (approximately 1.5 m), root uptake of this water by future plants with deeper root systems on the proposed residential properties cannot be discounted.
6a	PFAS in deeper regional groundwater aquifer	Extraction and beneficial use of groundwater	Potable use	**Uncertain (*but unlikely to be a complete exposure pathway*)**	Given the localised extent of the perched water, this water source will not be supportive of sustainable utilisation for any beneficial purpose. The migration of the isolated perched groundwater to the regional aquifer is yet to be determined and remains a data gap to be investigated. It is noted however that the site is underlain by high plasticity clays, which reduces the likelihood of impact the regional aquifer. The residential development will also be supplied with reticulated water, making the extraction and beneficial use of groundwater unnecessary.
			Consumption of irrigated produce		
			Incidental ingestion of water during recreational use		
6b		Freshwater ecosystem of Dry Creek	Discharge of impacted groundwater and surface water into the aquatic environment	**Uncertain (but unlikely to be a complete exposure pathway)**	Dry Creek is located approximately 425 m north of the site. The potential linkage between the perched water and Dry Creek is therefore highly improbable. The available dataset suggests that widespread substantial impacts to the regional aquifer underlying the site are unlikely. Results (< LOR) of sediment samples collected from the ephemeral creek and retention pond, approximately 220 m to the west of the site, are indicative of no associated impact.
6c		Recreational users of Dry Creek River Trail		**Incomplete exposure pathway**	Discharge of surface water runoff from the site to Dry Creek remains a data gap.

11.2 Potentially Complete Source-Pathway-Receptor Linkages

The following lists potential human and ecological receptors of concern for the identified contamination sources described in Table 11.1 above. Several SPR linkages were determined to be unlikely or incomplete on the basis of analytical results less than the applicable screening level, or the absence of a complete migration route within or between media. Unlikely and incomplete linkages are described in Table 11.1.

Human Health

– On-site and offsite construction workers performing intrusive activities in direct contact with PFAS-impacted soils. In order to provide a more accurate assessment of the potential health risks that may be associated with construction workers engaging in intrusive activities (e.g., earth moving, installation of building footers, and installation of subsurface utilities), a site-specific risk assessment is recommended.
– Future offsite residents in direct contact with PFAS-impacted soils, and consumption of home-grown produce/fruit trees grown in PFAS-impacted soils and groundwater. A site-specific risk assessment or remediation is recommended to further evaluate exposure by future residents surrounding the site.
– Extraction of (and subsequent contact or ingestion of) groundwater for potable or non-potable use (151 registered bores located within a 2 km radius of the site). Additional investigation is recommended (installation of a deep well) to confirm the presence or absence of PFAS impacts in the regional aquifer.

Ecological

– Potential exposure of flora and fauna to accessible PFAS impacted soils or potential migration of impacted perched water or surface water to an ecological receptor is considered likely an incomplete pathway or low risk. Sampling of biota (for disposal) and surface water sampling is recommended to further investigate this data gap.

12. Existence of Site Contamination

Section 5B from the *Environment Protection (Site Contamination) Amendment Act 2007* (EP Act) states that:

(1) For the purposes of the Act, site contamination exists at a site if:

(a) chemical substances are present on or below the surface of the site in concentrations above the background concentrations (if any); and

(b) the chemical substances have, at least in part, come to be present there as a result of an activity at the site or elsewhere; and

(c) the presence of the chemical substances in those concentrations has resulted in:

(i) actual or potential harm to the health or safety of human beings that is not trivial, taking into account current or proposed land uses; or

(ii) actual or potential harm to water that is not trivial; or

(iii) other actual or potential environmental harm that is not trivial, taking into account current or proposed land uses.

It is understood that the SA EPA were notified of groundwater impacts, namely PFAS, under Section 83A of the Environment Protection Act 1993 on 10 August 2023.

Based on the information presented in this DSI report, PFAS-impacted soil contamination hotspots exist on-site and in adjacent properties in close proximity to the site. Site contamination also exists in relation to the isolated perched groundwater beneath the site.

13. Conclusions and Recommendations

The primary objectives of the DSI are to:

– Assess the nature and extent of identified site contamination, both on- and offsite, associated with historical use of PFAS containing AFFF.
– Assess the potential risks to human health and the environment associated with identified PFAS contamination on-site, in the context of continued industrial use.
– Assess the potential risks to human health and the environment associated with PFAS contamination migrating offsite, in the context of the relevant land uses and environments.
– Undertake appropriate 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 associated with the prospective offsite residential development.

In fulfilment of these objectives, GHD undertook, amongst others, the following tasks:

– Collection of 15 surface soil samples from the surrounding offsite properties to the west, south and east of the site.
– Advancement of 65 soil bores (10 on-site and 55 offsite), with associated soil logging, target-depth sampling and PFAS analysis.
– Installation and development of three permanent on-site groundwater monitoring wells and one temporary offsite groundwater monitoring well.

- Sampling and analysis of groundwater samples for PFAS analytes.
- Collection of 3 offsite sediment samples from the drainage swale (ephemeral creek), approximately 200 m west of the site, for PFAS analysis.
- Collection of surface-dust swab samples within the fire station to assess the potential PFAS exposure risk attributable to the settlement of ambient dust containing residual PFAS constituents.
- Refinement of the Conceptual Site Model (CSM) developed for the site, comprising an assessment of PFAS source areas, pathways, and receptors.

Conclusions

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

- PFAS impacts are noted on-site and for a limited extent offsite which can be attributed to the historical use of AFFF containing PFAS at the station.
- PFAS analytes were detected in surface soils, lower depth soils, pavers, groundwater and indoor dust deposits.
- PFAS were not detected in sediment samples collected from the nearby ephemeral creek and retention pond.
- Adequate data were obtained to delineate exceedances of adopted soil criteria both laterally and vertically.
- PFAS concentrations in on-site soils were below the adopted Site-specific Health Investigation Levels (SSHILs).
- Dust swab samples collected from indoor surfaces yielded results below the adopted exposure guidelines for on-site personnel.
- PFAS results obtained from paver samples were below the adopted on-site soil PFAS assessment criteria protective of human health and the environment.
- The only locations at which exceedances of the adopted on-site soil ecological exposure criteria were reported at BH04 (MW02) and S1. BH04 is positioned in the rear paved yard of the station, rendering the underlying soil effectively inaccessible to fauna and flora. S1 is located with an unpaved strip of land on the southern portion of the site.
- The soil investigation revealed the presence of PFAS concentrations in offsite locations which exceeded the HIL A criteria (protective of residents with gardens or accessible soil). These locations were in close proximity to the site's boundary (between 25 and 30 m).
- There were no exceedances of HIL B criteria (protective of residents with minimal opportunities for soil access) on the smaller proposed residential parcels south of the site.
- Investigations revealed the presence of localised shallow/perched groundwater extending beyond the western boundary of the site, to a distance of approximately 18 m (roughly 1,000 m^2 in total extent).
- PFAS concentrations in samples obtained from the on-site monitoring wells in this area and a temporary offsite monitoring well west of the site exceeded the adopted groundwater criteria.
- The perched water may be due to the presence of subsurface infrastructure, including irrigation and storm water systems. A site inspection by a plumber identified a leaking tap connected to the irrigation system at the site. The presence of fluoride in one sample and the relatively low salinity indicates a likely fresh water input. The significance of this leaky tap to the presence of the localized perched groundwater is unknown at this time.
- Due to the shallow nature of the PFAS-impacted groundwater – although localised in extent – root uptake of this water by trees/plants cannot be discounted. This presents a potential complete linkage from an ecological perspective.
- Although certain trees, shrubs and grasses within the prospective development area have been identified for clearance/removal to accommodate future infrastructure, it is understood that individual trees of significance will remain. At this stage, it is not known which trees and groundcover will remain, however this presents a possible complete linkage in the source-pathway-receptor ecosystem continuum. Vegetation requiring removal will require testing which will provide insight into potential ecological risks.

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:

– Additional monitoring of the isolated perched groundwater observed at the site to provide information on the significance of the leaking tap to the presence of perched groundwater. Obtaining additional information on perched groundwater will facilitate a more detailed assessment of potential ecological and human health risks (e.g. root uptake by edible plants and subsequent consumption by future residents to the west of the site).
– Investigation of the migration route (if present) between the isolated perched groundwater and a potential deeper regional aquifer through the installation of a deep well (>15 m bgl).
– Perform a site-specific risk assessment to assess potential risks for a construction worker involved in the development of the proposed residences adjacent to the site. This risk assessment may include the derivation of SSHILs protective of a construction worker.
– Development of an institutional control for the on-site property to eliminate risks for a construction worker performing intrusive activities on-site (e.g., health and safety plan).
– Perform a site-specific risk assessment to further assess potential risks of future residents to PFAS-containing soil on proposed subdivided parcels to the east and west of the site. If it is determined that excessive risk exists, a remediation options assessment will be performed.

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Tables

Table 1 Soil Analytical Results
Table 2 Sediment Analytical Results
Table 3 Paver Analytical Results
Table 4 Swab Analytical Results
Table 5 Groundwater Analytical Results

Figures

Figure 1	Oakden Site Location Plan
Figure 2	Oakden Site Layout Plan
Figure 3	Oakden Groundwater Well, Soil Bore Locations, and Surface Soil Sample Locations
Figure 4	Oakden On-site Sample Locations
Figure 5	Oakden Offsite Sample Locations
Figure 6	Oakden Soil Exceedances of Adopted Criteria
Figure 7	Sample Locations in Relation to Proposed Offsite Development
Figure 8	Oakden Groundwater Exceedances of Adopted Criteria
Figure 9	PFAS Concentration Heatmap (0.0 – 0.5 mbgl)
Figure 10	PFAS Concentration Heatmap (0.5 – 1.0 mbgl)
Figure 11	PFAS Concentration Heatmap (1.0 – 1.5 mbgl)
Figure 12	PFAS Concentration Heatmap (1.5 – 2.0 mbgl)
Figure 13	PFAS Concentration Heatmap (> 2.0 mbgl)



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0 5 10 15 20

Meters

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

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South Australian Metropolitan Fire Service
Oakden DSI

Project No. **12611126**
Revision No. **A**
Date **10/10/2023**

Oakden Site Location Plan

FIGURE 1

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Project No. **12611126**
Revision No. **B**
Date **15/11/2023**

Oakden Site Layout Plan

FIGURE 2

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Paper Size ISO A3

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Meters

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

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Oakden DSI

Oakden Groundwater Well, Soil Bore Locations, and Surface Soil Sample Locations

Project No. **12611126**
Revision No. **A**
Date **10/10/2023**

FIGURE 3

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Meters

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

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Oakden DSI

Project No. **12611126**
Revision No. **A**
Date **10/10/2023**

Oakden On-site Sample Locations

FIGURE 4

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South Australian Metropolitan Fire Service
Oakden DSI

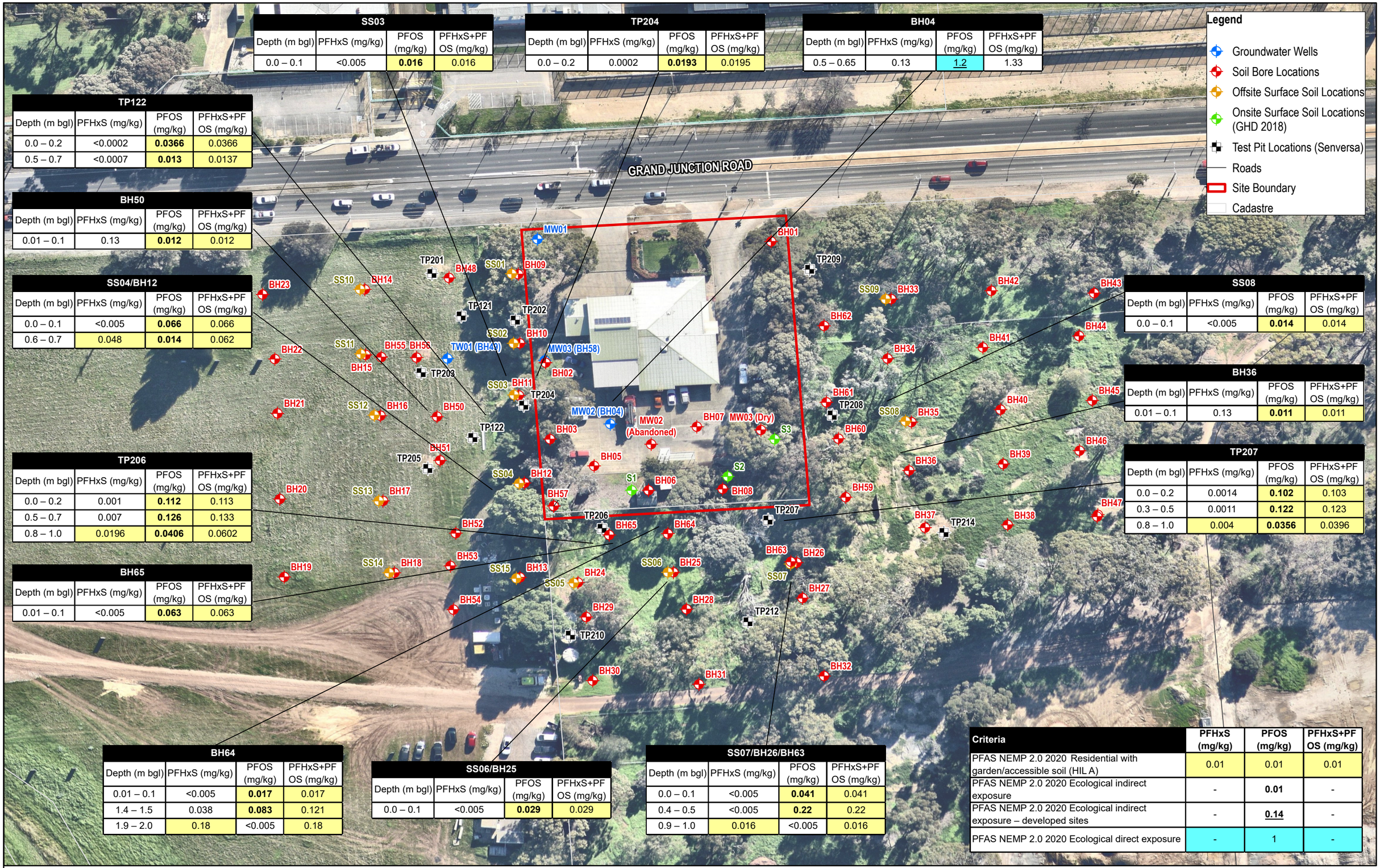
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Revision No. **B**
Date **15/11/2023**

Oakden Off-site Sample Locations

FIGURE 5

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Data source: GHD: Site Boundary (2022); DPTI: Cadastre, Roads (2015). Nearmap WMS: Imagery (Date Extracted: 09/10/2023). Created by: ejuan



SS03			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.016**	0.016

TP204			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.0002	**0.0193**	0.0195

BH04			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.5 – 0.65	0.13	1.2	1.33

Legend

- Groundwater Wells
- Soil Bore Locations
- Offsite Surface Soil Locations
- Onsite Surface Soil Locations (GHD 2018)
- Test Pit Locations (Senversa)
- Roads
- Site Boundary
- Cadastre

TP122			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	<0.0002	**0.0366**	0.0366
0.5 – 0.7	<0.0007	**0.013**	0.0137

BH50			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	0.13	**0.012**	0.012

SS04/BH12			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.066**	0.066
0.6 – 0.7	0.048	**0.014**	0.062

SS08			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.014**	0.014

BH36			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	0.13	**0.011**	0.011

TP206			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.001	**0.112**	0.113
0.5 – 0.7	0.007	**0.126**	0.133
0.8 – 1.0	0.0196	**0.0406**	0.0602

TP207			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.0014	**0.102**	0.103
0.3 – 0.5	0.0011	**0.122**	0.123
0.8 – 1.0	0.004	**0.0356**	0.0396

BH65			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	<0.005	**0.063**	0.063

BH64			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	<0.005	**0.017**	0.017
1.4 – 1.5	0.038	**0.083**	0.121
1.9 – 2.0	0.18	<0.005	0.18

SS06/BH25			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.029**	0.029

SS07/BH26/BH63			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.041**	0.041
0.4 – 0.5	<0.005	**0.22**	0.22
0.9 – 1.0	0.016	<0.005	0.016

Criteria	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)	0.01	0.01	0.01
PFAS NEMP 2.0 2020 Ecological indirect exposure	-	**0.01**	-
PFAS NEMP 2.0 2020 Ecological indirect exposure – developed sites	-	**0.14**	-
PFAS NEMP 2.0 2020 Ecological direct exposure	-	1	-

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Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 54

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South Australian Metropolitan Fire Service
Oakden DSI

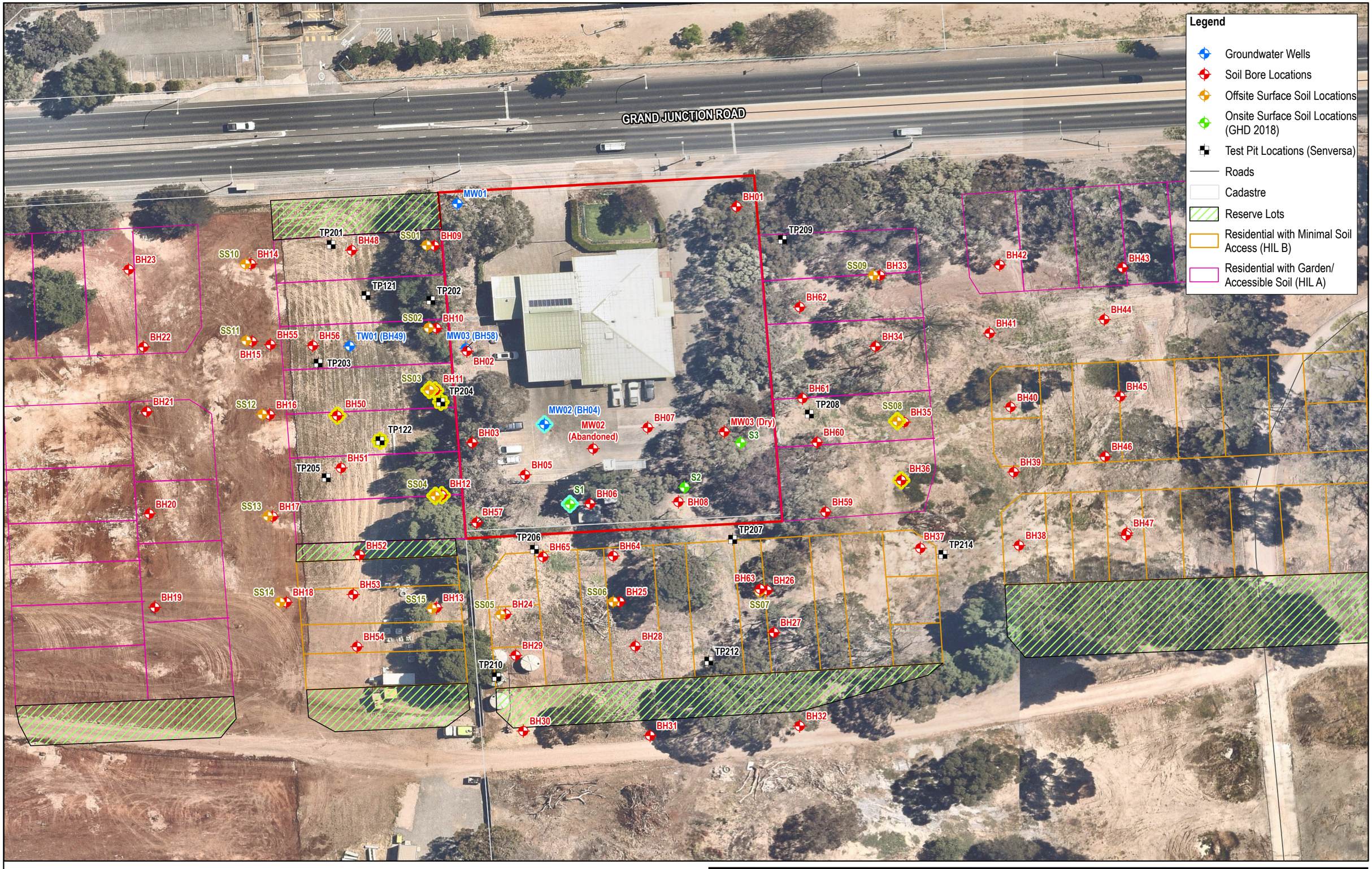
Oakden Soil Exceedances of Adopted Criteria

Project No. **12611126**
Revision No. **A**
Date **10/10/2023**

FIGURE 6

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Oakden DSI

Sample Locations in Relation to Proposed Off-site Development

Project No. **12611126**
Revision No. **D**
Date **15/11/2023**

FIGURE 7

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Print date: 15 Nov 2023 - 17:30

Data source: GHD: Site Boundary (2022); DPTI: Cadastre, Roads (2015). Nearmap WMS: Imagery (Date Extracted: 09/10/2023). Created by: ejuan

TW01				
Date	PFHxS (µg/L)	PFOS (µg/L)	PFOA (µg/L)	PFHxS+PFOS (µg/L)
14/09/2023	0.95	1	0.07	1.95

MW01				
Date	PFHxS (µg/L)	PFOS (µg/L)	PFOA (µg/L)	PFHxS+PFOS (µg/L)
3/08/2023	0.08	0.19	0.12	0.27
14/09/2023	0.02	0.03	0.02	0.05

MW03				
Date	PFHxS (µg/L)	PFOS (µg/L)	PFOA (µg/L)	PFHxS+PFOS (µg/L)
14/09/2023	0.04	0.04	<0.01	0.08

MW02				
Date	PFHxS (µg/L)	PFOS (µg/L)	PFOA (µg/L)	PFHxS+PFOS (µg/L)
3/08/2023	170	35	11	200
14/09/2023	96	32	6.5	128

Criteria	PFHxS (µg/L)	PFOS (µg/L)	PFOA (µg/L)	PFHxS+PFOS (µg/L)
PFAS NEMP 2.0 2020 Health Drinking Water	0.07	0.07	0.56	0.07
PFAS NEMP 2.0 2020 Freshwater – 95% – slightly to moderately disturbed systems	-	0.13	220	-
ADWG 2011 Recreational (v3.7 updated 2022)	0.7	0.7	5.6	0.7

Legend
- Groundwater Wells
- Soil Bore Locations
- Offsite Surface Soil Location
- Onsite Surface Soil Locations (GHD 2018)
- Test Pit Locations (Senversa)
- Roads
- Site Boundary
- Cadastre

GRAND JUNCTION ROAD

MW01, BH01, TP209, TP201, SS01, BH09, BH48, SS10, BH14, BH23, TP121, TP202, SS02, BH10, BH62, SS09, BH33, BH42, BH43, BH44, BH41, BH34, TW01 (BH49), MW03 (BH58), BH56, TP203, BH15, SS11, BH55, BH22, BH02, SS03, BH11, TP204, BH61, TP208, BH40, BH45, BH21, SS12, BH16, BH50, MW02 (BH04), BH07, MW03 (Dry), S3, SS08, BH35, BH60, TP122, BH03, MW02 (Abandoned), BH51, TP205, BH05, S2, SS04, BH12, S1, BH06, BH08, BH59, BH36, BH39, BH46, BH20, SS13, BH17, BH57, TP207, BH37, TP214, BH38, BH47, BH52, TP206, BH64, BH65, BH63, BH26, BH53, SS14, BH18, BH19, SS15, BH13, SS05, BH24, SS06, BH25, SS07, BH27, BH54, BH28, BH29, TP212, TP210, BH30, BH31, BH32

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

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South Australian Metropolitan Fire Service
Oakden DSI

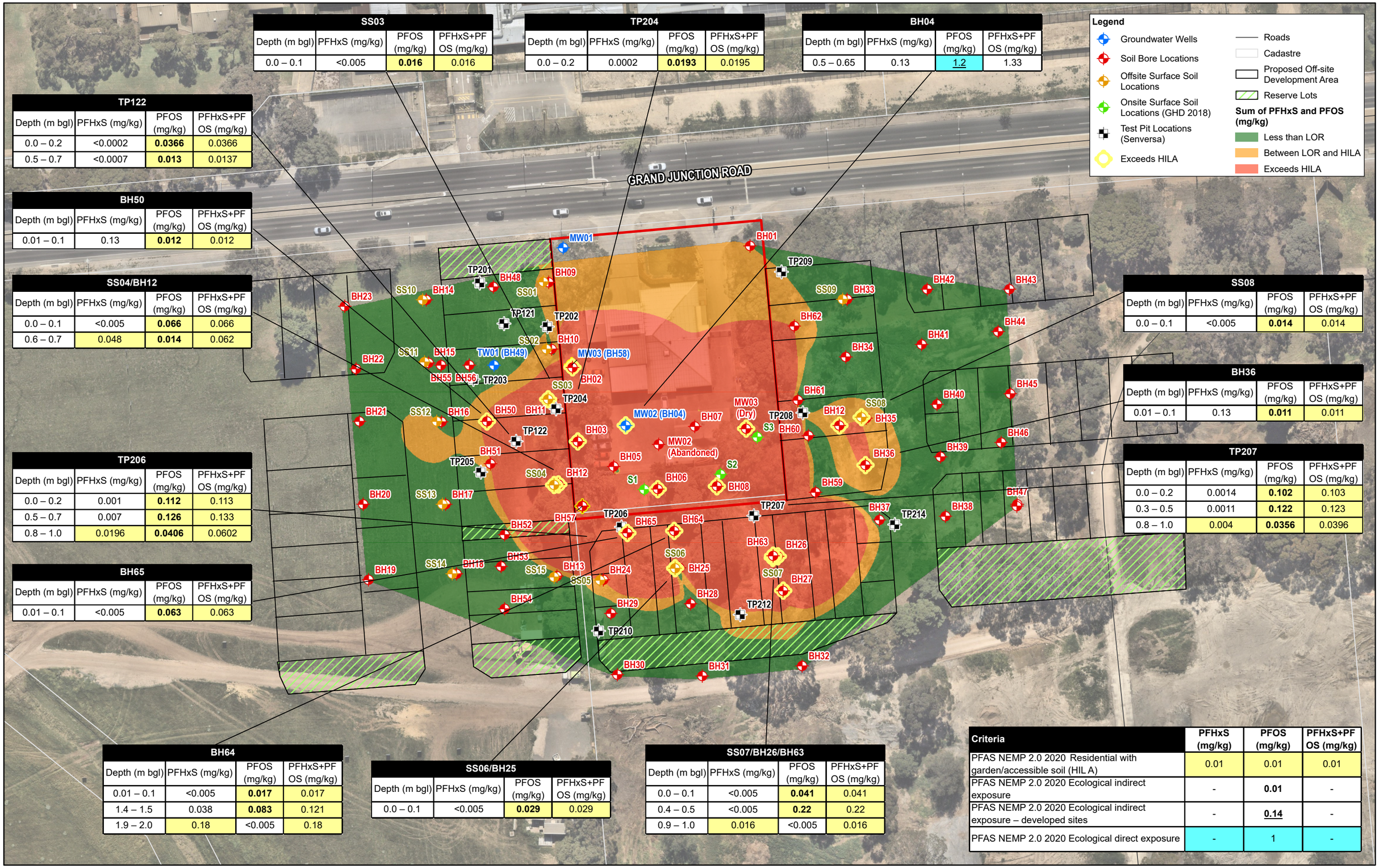
Oakden Groundwater Exceedances of Adopted Criteria

Project No. 12611126
Revision No. A
Date 11/10/2023

FIGURE 8

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SS03

Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.016**	0.016

TP204

Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.0002	**0.0193**	0.0195

BH04

Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.5 – 0.65	0.13	1.2	1.33

TP122

Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	<0.0002	**0.0366**	0.0366
0.5 – 0.7	<0.0007	**0.013**	0.0137

BH50

Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	0.13	**0.012**	0.012

SS04/BH12

Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.066**	0.066
0.6 – 0.7	0.048	**0.014**	0.062

SS08

Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.014**	0.014

BH36

Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	0.13	**0.011**	0.011

TP207

Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.0014	**0.102**	0.103
0.3 – 0.5	0.0011	**0.122**	0.123
0.8 – 1.0	0.004	**0.0356**	0.0396

TP206

Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.001	**0.112**	0.113
0.5 – 0.7	0.007	**0.126**	0.133
0.8 – 1.0	0.0196	**0.0406**	0.0602

BH65

Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	<0.005	**0.063**	0.063

BH64

Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	<0.005	**0.017**	0.017
1.4 – 1.5	0.038	**0.083**	0.121
1.9 – 2.0	0.18	<0.005	0.18

SS06/BH25

Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.029**	0.029

SS07/BH26/BH63

Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.041**	0.041
0.4 – 0.5	<0.005	**0.22**	0.22
0.9 – 1.0	0.016	<0.005	0.016

Criteria	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)	0.01	0.01	0.01
PFAS NEMP 2.0 2020 Ecological indirect exposure	-	**0.01**	-
PFAS NEMP 2.0 2020 Ecological indirect exposure – developed sites	-	**0.14**	-
PFAS NEMP 2.0 2020 Ecological direct exposure	-	1	-

Data Disclaimer

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Paper Size ISO A3

0 10 20 30 40

Meters

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

N

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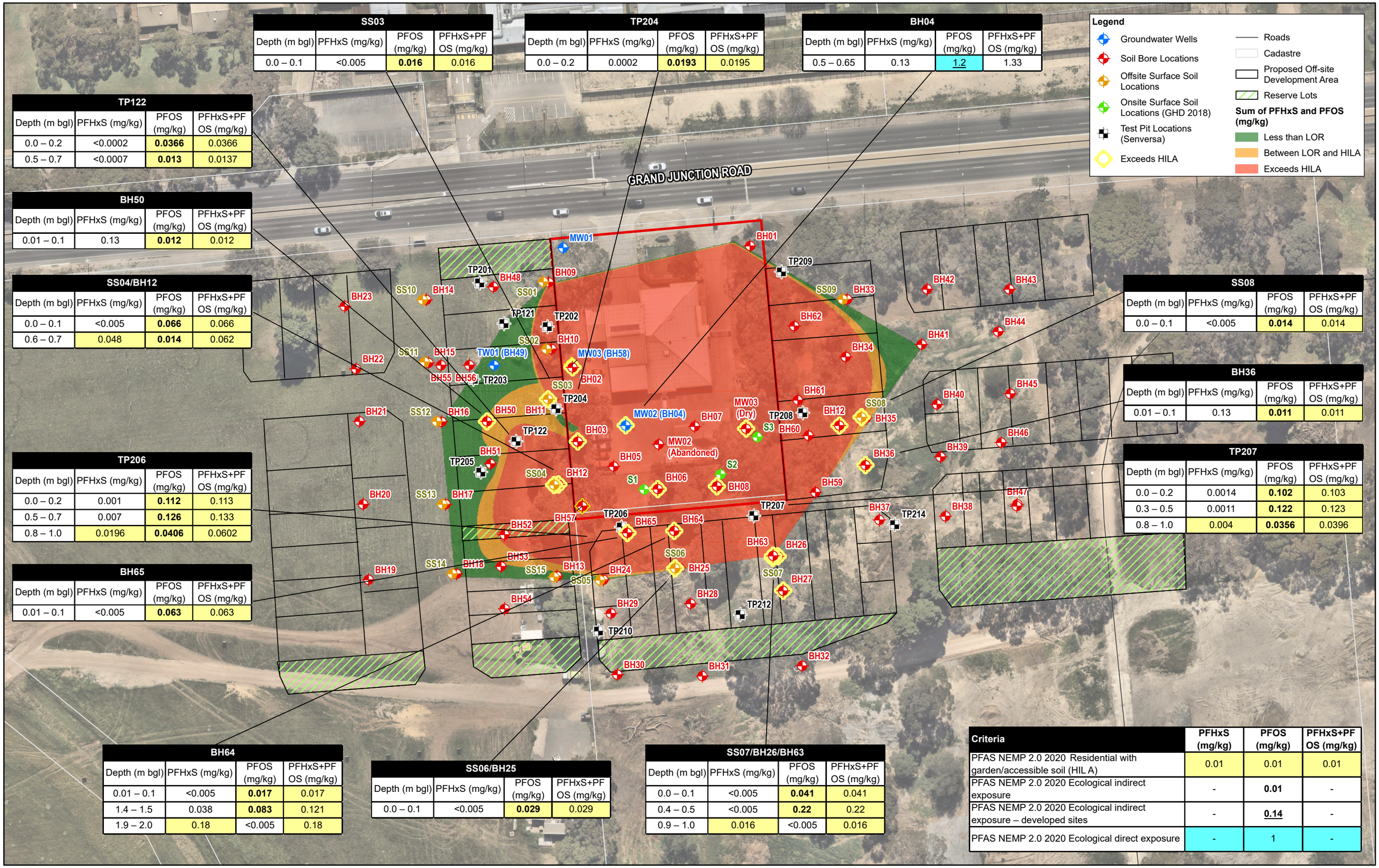
PFAS Concentration Heatmap (0.0 - 0.5 mbgl)

Project No. **12611126**
Revision No. **A**
Date **30/10/2023**

FIGURE 9

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Print date: 30 Oct 2023 - 15:53

Data source: GHD: Site Boundary (2022); DPTI: Cadastre, Roads (2015). Nearmap WMS: Imagery (Date Extracted: 09/10/2023). Created by: jhiggins



SS03			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.016**	0.016

TP204			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.0002	**0.0193**	0.0195

BH04			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.5 – 0.65	0.13	1.2	1.33

TP122			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	<0.0002	**0.0366**	0.0366
0.5 – 0.7	<0.0007	**0.013**	0.0137

BH50			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	0.13	**0.012**	0.012

SS04/BH12			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.066**	0.066
0.6 – 0.7	0.048	**0.014**	0.062

SS08			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.014**	0.014

BH36			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	0.13	**0.011**	0.011

TP207			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.0014	**0.102**	0.103
0.3 – 0.5	0.0011	**0.122**	0.123
0.8 – 1.0	0.004	**0.0356**	0.0396

TP206			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.001	**0.112**	0.113
0.5 – 0.7	0.007	**0.126**	0.133
0.8 – 1.0	0.0196	**0.0406**	0.0602

BH65			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	<0.005	**0.063**	0.063

BH64			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	<0.005	**0.017**	0.017
1.4 – 1.5	0.038	**0.083**	0.121
1.9 – 2.0	0.18	<0.005	0.18

SS06/BH25			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.029**	0.029

SS07/BH26/BH63			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.041**	0.041
0.4 – 0.5	<0.005	**0.22**	0.22
0.9 – 1.0	0.016	<0.005	0.016

Criteria	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)	0.01	0.01	0.01
PFAS NEMP 2.0 2020 Ecological indirect exposure	-	**0.01**	-
PFAS NEMP 2.0 2020 Ecological indirect exposure – developed sites	-	**0.14**	-
PFAS NEMP 2.0 2020 Ecological direct exposure	-	1	-

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Paper Size ISO A3

0 10 20 30 40

Meters

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

N

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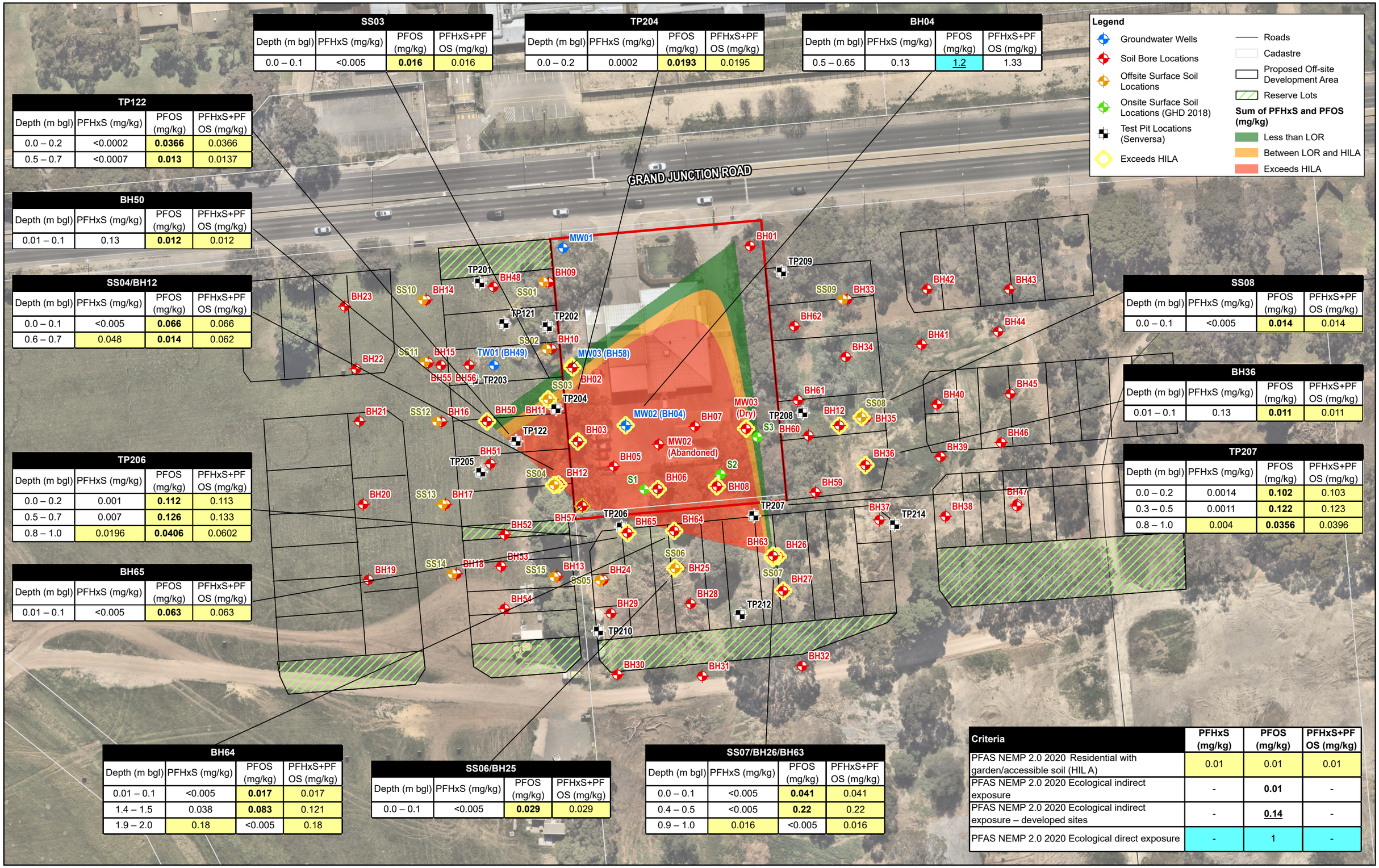
PFAS Concentration Heatmap (0.5 - 1.0 mbgl)

Project No. **12611126**
Revision No. **A**
Date **30/10/2023**

FIGURE 10

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Print date: 30 Oct 2023 - 15:57

Data source: GHD: Site Boundary (2022); DPTI: Cadastre, Roads (2015). Nearmap WMS: Imagery (Date Extracted: 09/10/2023). Created by: jhiggins



SS03			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.016**	0.016

TP204			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.0002	**0.0193**	0.0195

BH04			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.5 – 0.65	0.13	1.2	1.33

TP122			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	<0.0002	**0.0366**	0.0366
0.5 – 0.7	<0.0007	**0.013**	0.0137

BH50			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	0.13	**0.012**	0.012

SS04/BH12			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.066**	0.066
0.6 – 0.7	0.048	**0.014**	0.062

SS08			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.014**	0.014

BH36			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	0.13	**0.011**	0.011

TP207			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.0014	**0.102**	0.103
0.3 – 0.5	0.0011	**0.122**	0.123
0.8 – 1.0	0.004	**0.0356**	0.0396

TP206			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.001	**0.112**	0.113
0.5 – 0.7	0.007	**0.126**	0.133
0.8 – 1.0	0.0196	**0.0406**	0.0602

BH65			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	<0.005	**0.063**	0.063

BH64			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	<0.005	**0.017**	0.017
1.4 – 1.5	0.038	**0.083**	0.121
1.9 – 2.0	0.18	<0.005	0.18

SS06/BH25			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.029**	0.029

SS07/BH26/BH63			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.041**	0.041
0.4 – 0.5	<0.005	**0.22**	0.22
0.9 – 1.0	0.016	<0.005	0.016

Criteria	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)	0.01	0.01	0.01
PFAS NEMP 2.0 2020 Ecological indirect exposure	-	**0.01**	-
PFAS NEMP 2.0 2020 Ecological indirect exposure – developed sites	-	**0.14**	-
PFAS NEMP 2.0 2020 Ecological direct exposure	-	1	-

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Paper Size ISO A3

0 10 20 30 40

Meters

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

N

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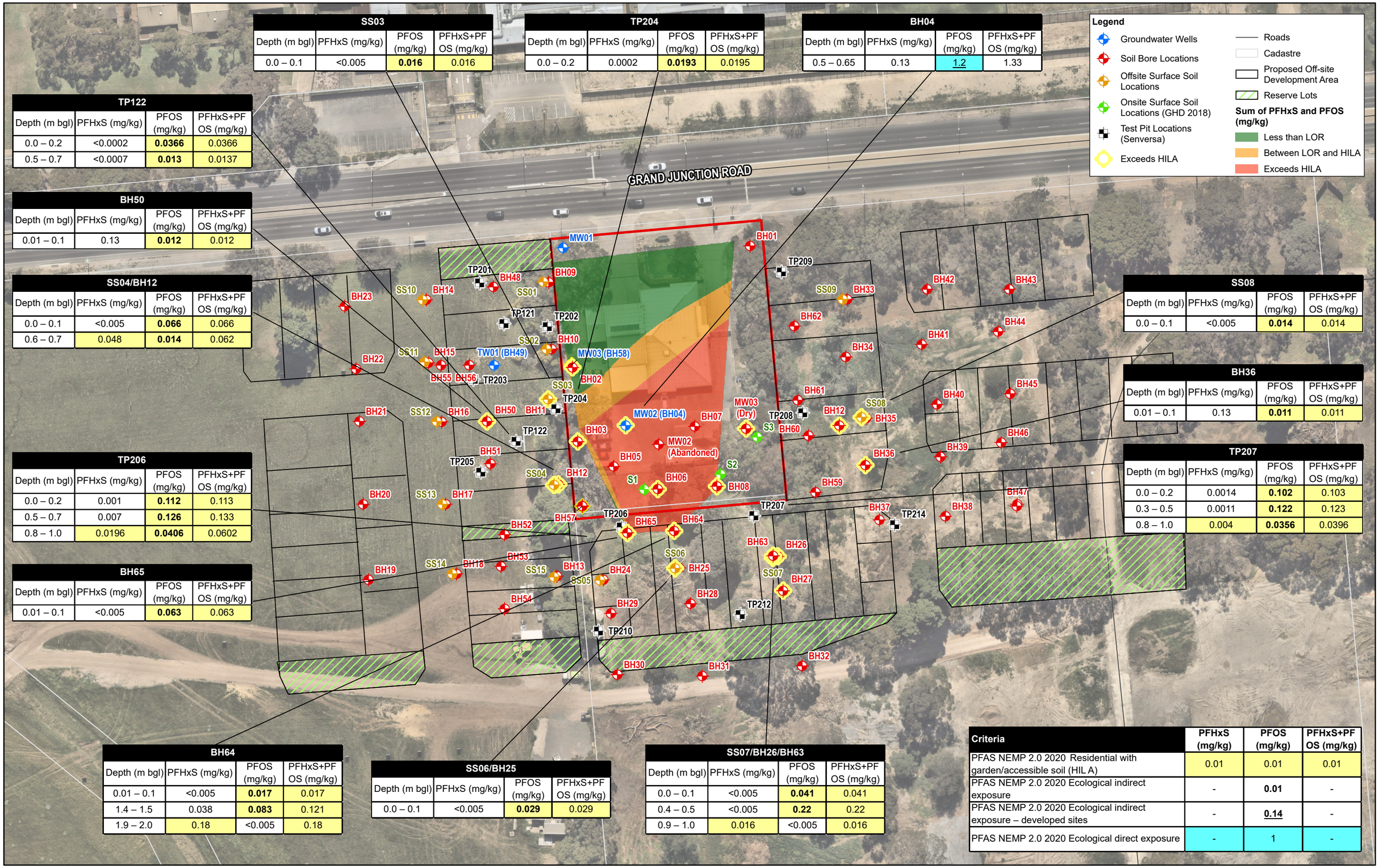
PFAS Concentration Heatmap (1.0 - 1.5 mbgl)

Project No. **12611126**
Revision No. **A**
Date **30/10/2023**

FIGURE 11

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Print date: 30 Oct 2023 - 15:58

Data source: GHD: Site Boundary (2022); DPTI: Cadastre, Roads (2015). Nearmap WMS: Imagery (Date Extracted: 09/10/2023). Created by: jhiggins



SS03			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.016**	0.016

TP204			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.0002	**0.0193**	0.0195

BH04			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.5 – 0.65	0.13	1.2	1.33

TP122			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	<0.0002	**0.0366**	0.0366
0.5 – 0.7	<0.0007	**0.013**	0.0137

BH50			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	0.13	**0.012**	0.012

SS04/BH12			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.066**	0.066
0.6 – 0.7	0.048	**0.014**	0.062

SS08			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.014**	0.014

BH36			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	0.13	**0.011**	0.011

TP207			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.0014	**0.102**	0.103
0.3 – 0.5	0.0011	**0.122**	0.123
0.8 – 1.0	0.004	**0.0356**	0.0396

TP206			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.001	**0.112**	0.113
0.5 – 0.7	0.007	**0.126**	0.133
0.8 – 1.0	0.0196	**0.0406**	0.0602

BH65			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	<0.005	**0.063**	0.063

BH64			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	<0.005	**0.017**	0.017
1.4 – 1.5	0.038	**0.083**	0.121
1.9 – 2.0	0.18	<0.005	0.18

SS06/BH25			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.029**	0.029

SS07/BH26/BH63			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.041**	0.041
0.4 – 0.5	<0.005	**0.22**	0.22
0.9 – 1.0	0.016	<0.005	0.016

Criteria	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)	0.01	0.01	0.01
PFAS NEMP 2.0 2020 Ecological indirect exposure	-	**0.01**	-
PFAS NEMP 2.0 2020 Ecological indirect exposure – developed sites	-	**0.14**	-
PFAS NEMP 2.0 2020 Ecological direct exposure	-	1	-

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Paper Size ISO A3

0 10 20 30 40

Meters

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

N

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South Australian Metropolitan Fire Service
Oakden DSI

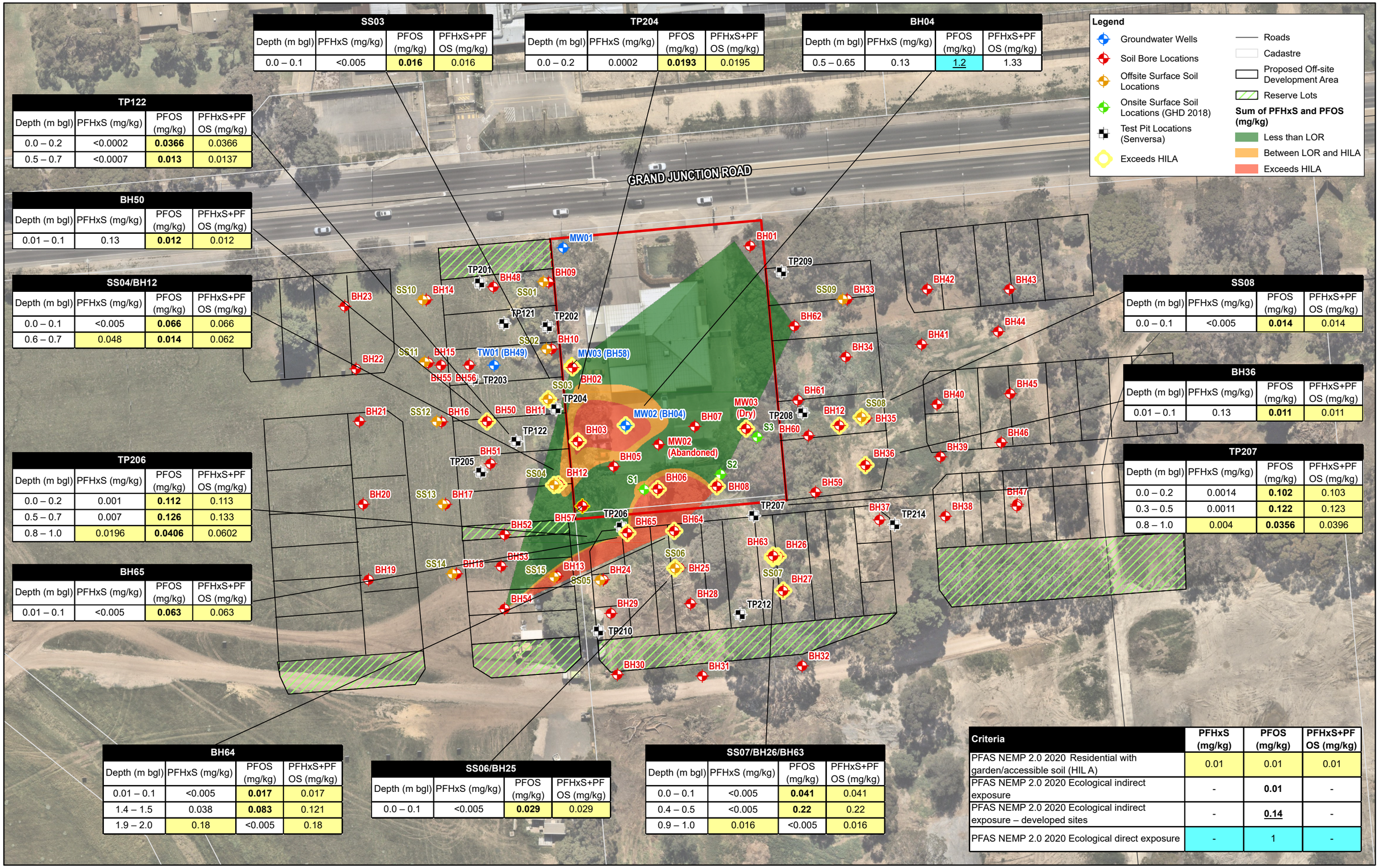
PFAS Concentration Heatmap (1.5 - 2.0 mbgl)

Project No. **12611126**
Revision No. **A**
Date **30/10/2023**

FIGURE 12

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Print date: 30 Oct 2023 - 15:58

Data source: GHD: Site Boundary (2022); DPTI: Cadastre, Roads (2015). Nearmap WMS: Imagery (Date Extracted: 09/10/2023). Created by: jhiggins



SS03			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.016**	0.016

TP204			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.0002	**0.0193**	0.0195

BH04			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.5 – 0.65	0.13	1.2	1.33

TP122			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	<0.0002	**0.0366**	0.0366
0.5 – 0.7	<0.0007	**0.013**	0.0137

BH50			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	0.13	**0.012**	0.012

SS04/BH12			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.066**	0.066
0.6 – 0.7	0.048	**0.014**	0.062

SS08			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.014**	0.014

BH36			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	0.13	**0.011**	0.011

TP207			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.0014	**0.102**	0.103
0.3 – 0.5	0.0011	**0.122**	0.123
0.8 – 1.0	0.004	**0.0356**	0.0396

TP206			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.2	0.001	**0.112**	0.113
0.5 – 0.7	0.007	**0.126**	0.133
0.8 – 1.0	0.0196	**0.0406**	0.0602

BH65			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	<0.005	**0.063**	0.063

BH64			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.01 – 0.1	<0.005	**0.017**	0.017
1.4 – 1.5	0.038	**0.083**	0.121
1.9 – 2.0	0.18	<0.005	0.18

SS06/BH25			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.029**	0.029

SS07/BH26/BH63			
Depth (m bgl)	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
0.0 – 0.1	<0.005	**0.041**	0.041
0.4 – 0.5	<0.005	**0.22**	0.22
0.9 – 1.0	0.016	<0.005	0.016

Criteria	PFHxS (mg/kg)	PFOS (mg/kg)	PFHxS+PFOS (mg/kg)
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)	0.01	0.01	0.01
PFAS NEMP 2.0 2020 Ecological indirect exposure	-	**0.01**	-
PFAS NEMP 2.0 2020 Ecological indirect exposure – developed sites	-	**0.14**	-
PFAS NEMP 2.0 2020 Ecological direct exposure	-	1	-

Data Disclaimer

© 2023. Whilst every care has been taken to prepare this map, GHD, DPTI and Nearmap make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.

Paper Size ISO A3

0 10 20 30 40

Meters

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

N

GHD

South Australian Metropolitan Fire Service
Oakden DSI

PFAS Concentration Heatmap (> 2.0 mbgl)

Project No. 12611126
Revision No. A
Date 30/10/2023

FIGURE 13

\\ghdnet\ghd\AU\Melbourne\Projects\33\12611126\GIS\Maps\Deliverables\12611126_Figures.aprx
Print date: 30 Oct 2023 - 15:59

Data source: GHD: Site Boundary (2022); DPTI: Cadastre, Roads (2015). Nearmap WMS: Imagery (Date Extracted: 09/10/2023). Created by: jhiggins

Appendices

Appendix A

SA EPA Letter

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

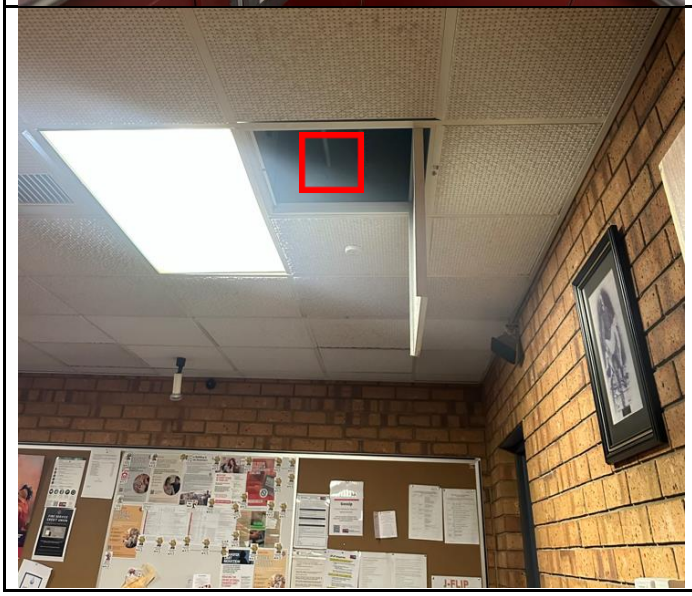
Date: 1 February 2023

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

	DS01: Gym split air conditioning internal unit filter/screen
	DS02: Counter surface in equipment decontamination room
	DS03: TV Room HVAC air intake filter medium

	DS04: TV Room HVAC air outlet vent
	DS05: Kitchen table below HVAC air outlet vent

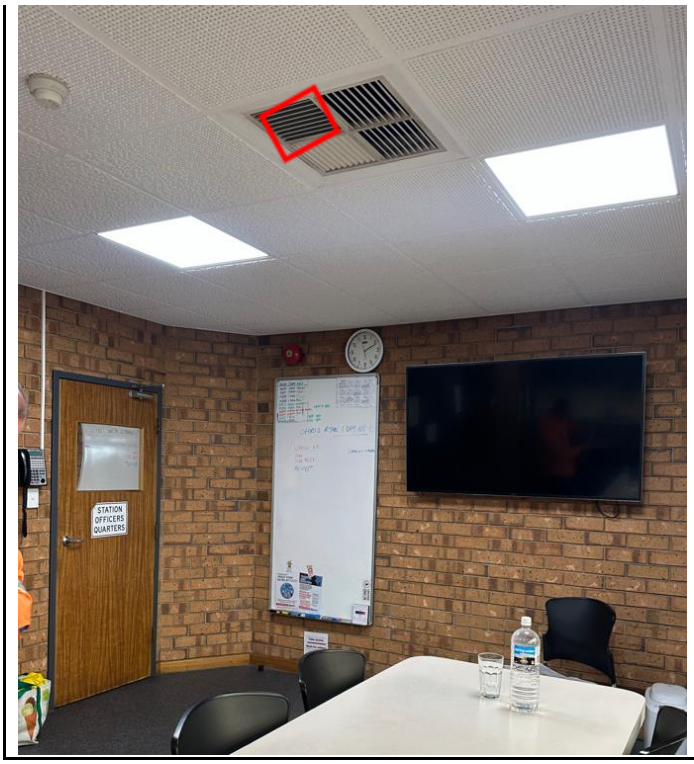
	DS06: Kitchen HVAC air outlet vent



Photo 1 ***North-west corner of MFS Oakden Fire Station with soil-moisture control system in foreground.***



Photo 2 ***Western border of site with development progressing in background (25 July 2023).***



Photo 3 ***Eastern border of site with clearance activities evident in background (25 July 2023).***



Photo 4 ***Soil bore BH01 (direct push).***



Photo 5 *Soil bore BH02 (direct push).*



Photo 6 *Soil bore BH03 (direct push).*



Photo 7 *Soil bore BH04 (direct push, progressed to monitoring well MW02).*



Photo 8 *Soil bore BH05 (direct push).*



Photo 9 *Soil bore BH06 (direct push).*



Photo 10 *Soil bore BH07 (direct push).*



Photo 11 *Soil bore BH08 (direct push).*



Photo 12 *Soil core from groundwater monitoring well MW01 (direct push).*



Photo 13 *Soil core from originally planned groundwater monitoring well MW02 (direct push, abandoned – dry).*



Photo 14 *Soil core from originally planned groundwater monitoring well MW03 (direct push, abandoned – dry).*



Photo 15 ***Soil bore BH09 (hand auger).***



Photo 16 ***Soil bore BH10 (hand auger).***



Photo 17 ***Soil bore BH11 (hand auger).***



Photo 18 ***Soil bore BH12 (hand auger).***



Photo 19 Soil bore BH13 (hand auger).



Photo 20 Soil bore BH14 (hand auger).



Photo 21 *Soil bore BH15 (hand auger).*



Photo 22 *Soil bore BH16 (hand auger).*



Photo 23 *Soil bore BH17 (hand auger).*



Photo 24 *Soil bore BH18 (hand auger).*



Photo 25 *Soil bore BH19 (hand auger).*



Photo 26 *Soil bore BH20 (hand auger).*



Photo 27 *Soil bore BH21 (hand auger).*



Photo 28 *Soil bore BH22 (hand auger).*



Photo 29 *Soil bore BH23 (hand auger).*



Photo 30 *Soil borehole BH24 (hand auger).*



Photo 31 *Soil borehole BH25 (hand auger).*



Photo 32 *Soil borehole BH26 (hand auger).*



Photo 33 *Soil borehole BH27 (hand auger).*



Photo 34 *Soil borehole BH28 (hand auger).*



Photo 35 *Soil borehole BH29 (hand auger).*



Photo 36 *Soil borehole BH30 (hand auger).*



Photo 37 *Soil borehole BH31 (hand auger).*



Photo 38 *Soil borehole BH32 (hand auger).*



Photo 39 *Soil borehole BH33 (hand auger).*



Photo 40 *Soil borehole BH34 (hand auger).*



Photo 41 *Soil borehole BH35 (hand auger).*



Photo 42 *Soil borehole BH36 (hand auger).*



Photo 43 *Soil borehole BH37 (hand auger).*



Photo 44 *Soil borehole BH38 (hand auger).*



Photo 45 *Soil borehole BH39 (hand auger).*



Photo 46 *Soil borehole BH40 (hand auger).*



Photo 47 *Soil borehole BH41 (hand auger).*



Photo 48 *Soil borehole BH42 (hand auger).*



Photo 49 *Soil borehole BH43 (hand auger).*



Photo 50 *Soil borehole BH44 (hand auger).*



Photo 51 *Soil borehole BH45 (hand auger).*



Photo 52 *Soil borehole BH46 (hand auger).*



Photo 53 *Soil borehole BH47 (hand auger).*



Photo 54 *Soil borehole BH48 (direct push).*



Photo 55 *Soil borehole BH49 (direct push, progressed to temporary groundwater monitoring well TW01).*



Photo 56 *Soil borehole BH50 (direct push).*



Photo 57 *Soil borehole BH51 (direct push).*



Photo 58 *Soil borehole BH52 (direct push).*



Photo 59 *Soil borehole BH53 (direct push).*



Photo 60 *Soil borehole BH54 (direct push).*



Photo 61 *Soil borehole BH55 (direct push).*



Photo 62 *Soil borehole BH56 (direct push).*



Photo 63 *Soil borehole BH57 (direct push).*



Photo 64 *Soil borehole BH58 (direct push, progressed to groundwater monitoring well MW03).*



Photo 65 *Soil borehole BH59 (direct push).*



Photo 66 *Soil borehole BH60 (direct push).*



Photo 67 *Soil borehole BH61 (direct push).*



Photo 68 *Soil borehole BH62 (direct push).*



Photo 69 *Soil borehole BH63 (direct push).*



Photo 70 *Soil borehole BH64 (direct push).*



Photo 71 *Soil borehole BH65 (direct push).*



Photo 72 *Retention basin, approximately 220 m west of the fire station, from which SED01 was collected (facing north-west).*



Photo 73 *Ephemeral creek/swale, downgradient (west), approximately central to the fire station, from which SED02 was collected (facing south-east).*



Photo 74 *Ephemeral creek/swale, south-west of fire station, from which SED03 was collected (facing north-west).*

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: Oakden SAMFS Fire Station

Name: B Shift

Position when working at the site: B Shift

Phone number: 82043830 **Email:** samfsoakdenbshift@sa.gov.au

Date of response: 01/07/22

Item	Question	Response
1	*When did you start working at this station?*	2005
2	*How long have you worked at this station?*	13 years
3	*Can you describe where stormwater from the site is usually discharged to (e.g. stormwater pit, nearby creek / pond, street gutter)?*	sump in rear yard then to stormwater eventually to dry creek
4	*Can you describe any changes in how stormwater has been managed at the site over time?*	Nil
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?*	at time of opening circa 1989
8	*Can you provide the product names of any AFFF used on the site? (e.g. Ansulite, 3M Light Water)*	no
9	*Was AFFF used in regular training exercises?* *If so:*	yes
9.1	*How often was the training?* *(e.g. weekly, monthly, quarterly)*	quarterly at most
9.2	*Can you describe the location of the training areas and annotate them on the site plan?*	rear yard
9.3	*Can provide an estimate of how much AFFF was used in each training?*	5L?
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?*	yes - contained within rear yard or sprayed onto government land (soon to be housing) over rear of station
9.6	*When was the date of the last training event that included the use of AFFF?*	unknown
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.*	to stormwater
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.*	yes stormwater
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.*	rear shed and truck tanks
15.1	*What type and size of storage containers were used to store AFFF on site?*	20L plastic containers
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?*	1x20L. Not sure if bulk 200L drums were ever stored here
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?*	either suctioned direct from container into pump or tipped from container into truck tank
17	*How were spent drums of AFFF disposed of?*	unknown
18	*Were there any wash down areas for fire trucks, equipment or AFFF containers?* *If so:*	yes, rear apron of engine room
18.1	*How was the waste water from such areas managed? (e.g. recycling, treatment, storage pond or discharge to drains)*	sump to stormwater
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.*	rear shed. engine oil, petrol
20	*Is there an incident log / register for the site?*	no

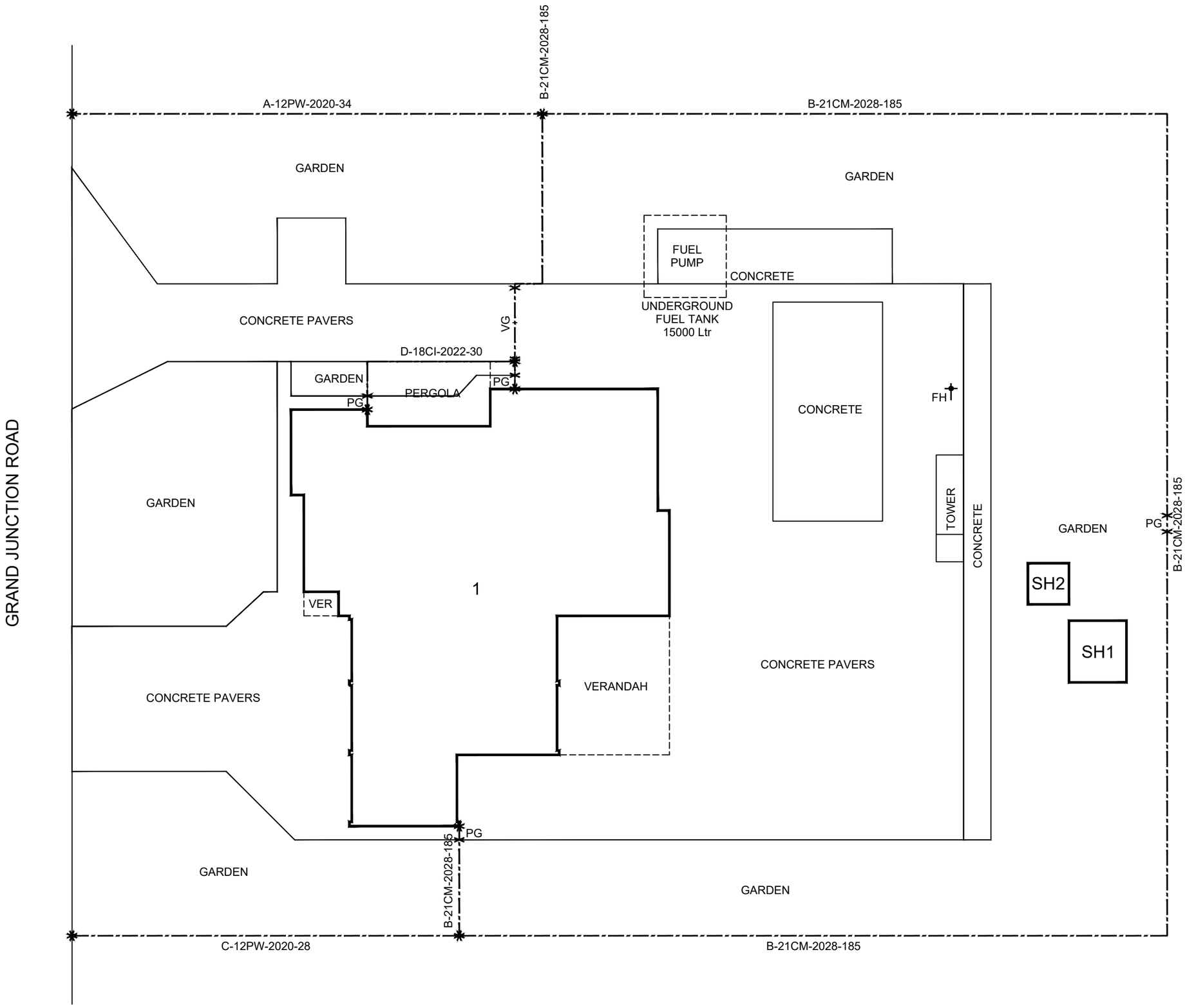
Item	Question	Response
21	*Are you aware of any AFFF (or other chemical) releases that may have occurred outside of typical application scenarios? If so:*	no
21.1	*When did such release(s) happen?*	
21.2	*What substance(s) was/were released?*	
21.3	*Where did such release(s) happen?* *Please annotate 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.*	
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?*	rear yard. vacant land over back fence which is due to be residential
23	*Have there been any significant bulk earthworks on the Station site that resulted in soil being relocated from one area to another?*	no
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 (1:300) | Plot at a scale of 1=0.3 | All dimensions to be verified on site

10 20 30 40 50 60 70 80

NORTH



BUILDINGS

1 FIRE STATION

SH1 GALV. IRON STORE SHED
SH2 GALV. IRON STORE SHED

FENCES *code-height-type-fail date-length (ms)*

CI corrugated iron	PI profiled iron
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*

OAKDEN SAMFS FIRE STATION GRAND JUNCTION ROAD GILLES PLAINS 5086

Government of South Australia
Department for Transport, Energy and Infrastructure

Asset no.	*09164*	Client.	*ODEPT*
DTEI Office.	*ADELAIDE*	Sheet.	*1 of 1*
Created by.	*Archink*	*C Kneebone*	*May 2010*
Modified by.	*aTAM*	*K Tydeman*	*May 2019*
Audited by.	*Archink*	*A Bentley*	*May 2010*
Title details.	*refer layer " site-allotment " RT 8862539*		
Site area.	*0.4800 ha*	Accuracy.	*site survey*

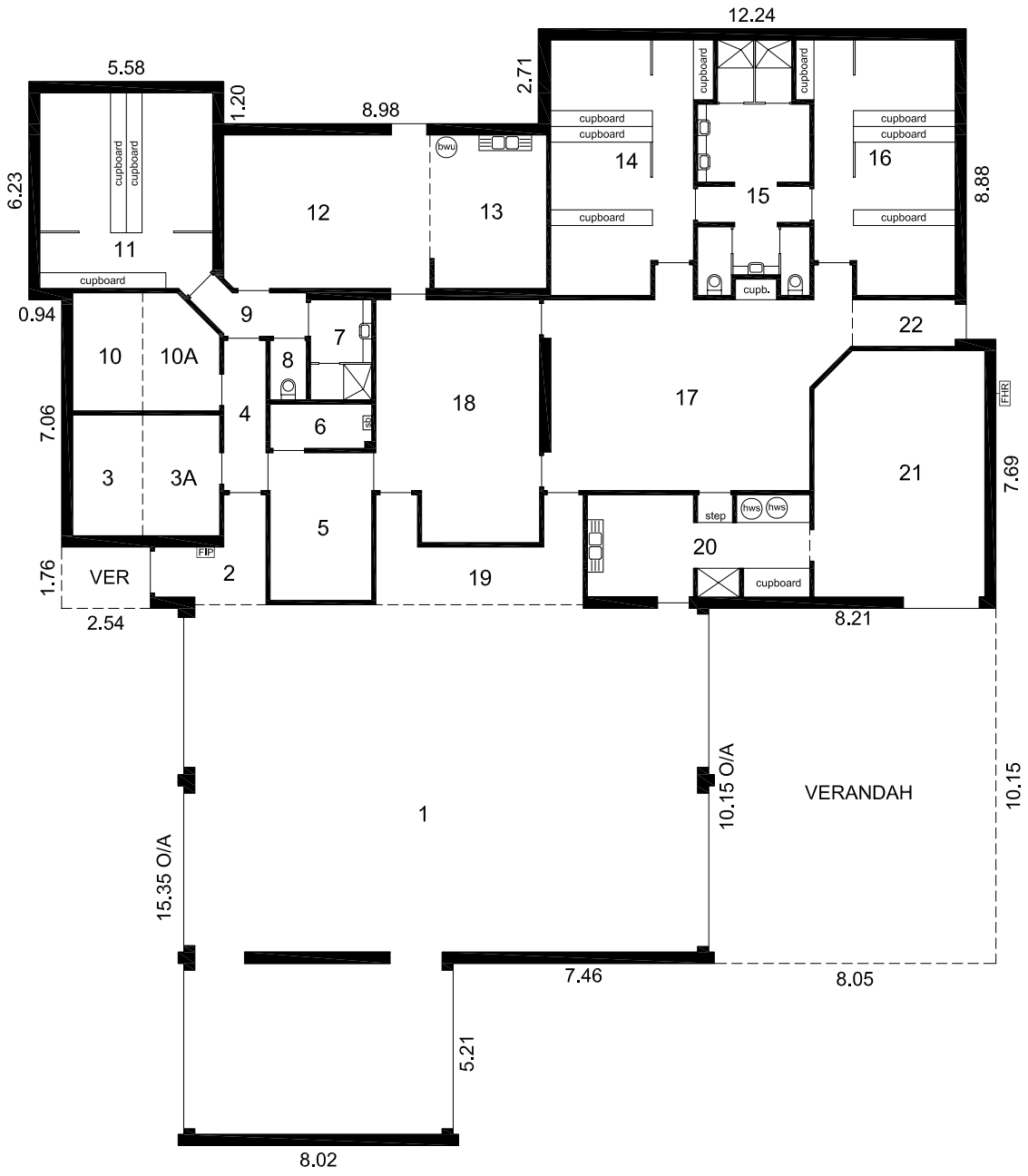
Strategic Asset Management Information System Plan

SAMIS 09164

1 10 20 30

Scale Bar Units in Metres (A4 1:200) Plot at a scale of 1=0.2 All dimensions to be verified on site

NORTH



Asset Name	**OAKDEN SAMFS**				
Building Use	**FIRE STATION**				
Created by.	*Archink*	Drawn	*C Kneebone*	Date	*May 2010*
Modified by.	*Archink*	Drawn	*A Bentley*	Date	*May 2010*
Bldg area m²	*597*	Ver area m²	*88*	Plan ref.	-

Government of South Australia
Department for Transport, Energy and Infrastructure

Strategic Asset Management Information System Plan

SAMIS 09164-01-1

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: Oakden SAMFS Fire Station

Name: B Shift

Position when working at the site: B Shift

Phone number: 82043830 **Email:** samfsoakdenbshift@sa.gov.au

Date of response: 01/07/22

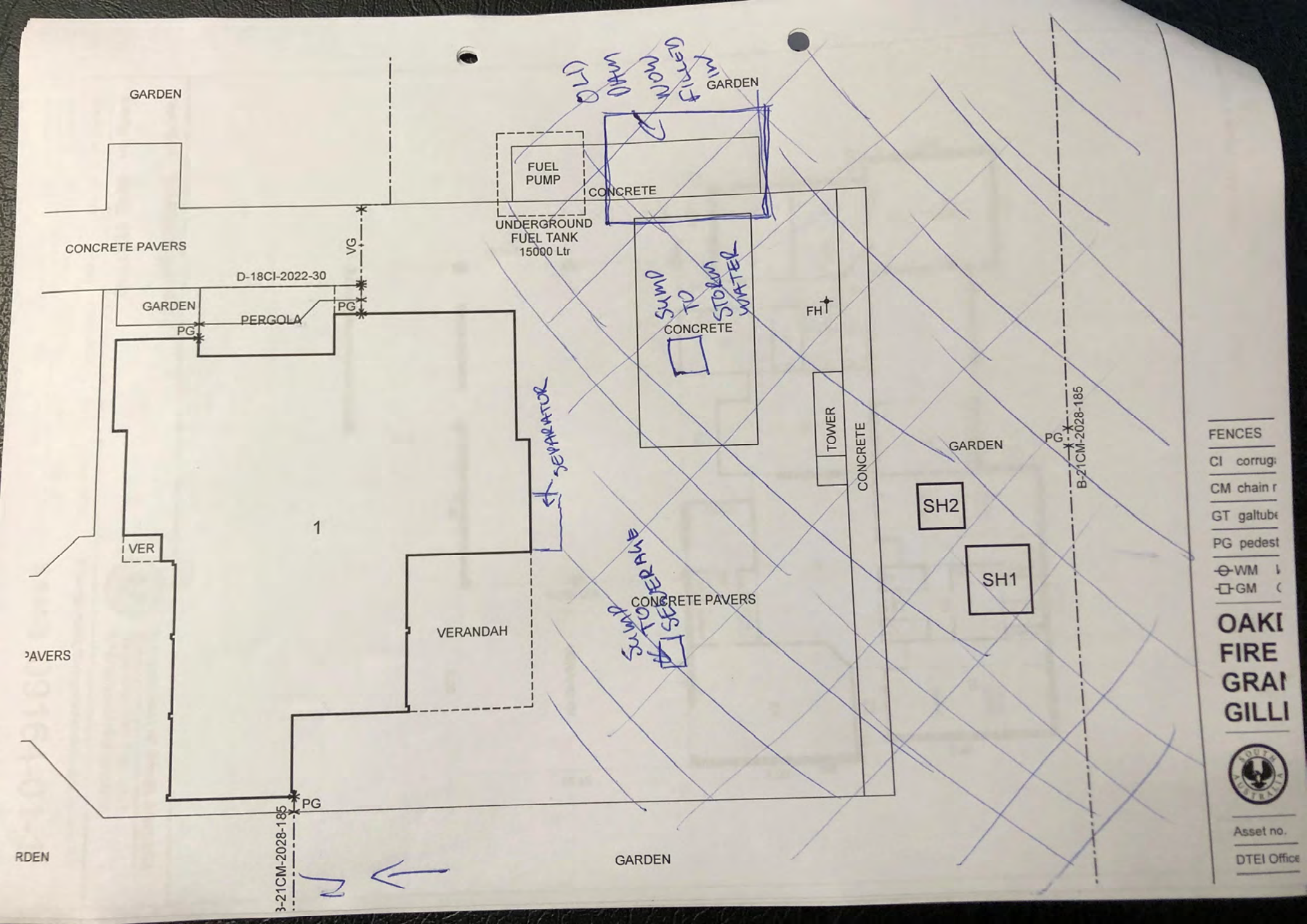
Item	Question	Response
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2	*How long have you worked at this station?*	13 years
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4	*Can you describe any changes in how stormwater has been managed at the site over time?*	Nil
5	*Is stormwater harvested within the site?*	no
5.1	*If yes, please describe where and how stormwater is harvested.*	
5.2	*For what purposes is stormwater harvested?*	
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6.1	*If yes, for what purpose is groundwater used at the site?*	

Item	Question	Response
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8	*Can you provide the product names of any AFFF used on the site? (e.g. Ansulite, 3M Light Water)*	no
9	*Was AFFF used in regular training exercises?* *If so:*	yes
9.1	*How often was the training?* *(e.g. weekly, monthly, quarterly)*	quarterly at most
9.2	*Can you describe the location of the training areas and annotate them on the site plan?*	rear yard
9.3	*Can provide an estimate of how much AFFF was used in each training?*	5L?
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?*	yes - contained within rear yard or sprayed onto government land (soon to be housing) over rear of station
9.6	*When was the date of the last training event that included the use of AFFF?*	unknown
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.*	to stormwater
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.*	yes stormwater
12	*Were there any changes how the waste water was managed over time?* *If so, please describe the changes.*	no
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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.*	rear shed. engine oil, petrol
20	*Is there an incident log / register for the site?*	no

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
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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.*	
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?*	rear yard. vacant land over back fence which is due to be residential
23	*Have there been any significant bulk earthworks on the Station site that resulted in soil being relocated from one area to another?*	no
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.


GARDEN
FUEL PUMP
CONCRETE
UNDERGROUND FUEL TANK 15000 Ltr
CONCRETE PAVERS
VG
D-18CI-2022-30
GARDEN
PERGOLA
PG
PG
SUMP TO STORM WATER
CONCRETE
FH
SEPARATOR
TOWER
CONCRETE
GARDEN
PG
B-21CM-2028-185
SH2
SH1
VER
1
SUMP TO SEPERATOR
CONCRETE PAVERS
VERANDAH
PAVERS
PG
B-21CM-2028-185
RDEN
GARDEN
FENCES
CI corrug
CM chain r
GT galtube
PG pedest
WM
GM
OAKI
FIRE
GRAI
GILLI
Asset no.
DTEI Office

Scale Bar Units in Metres (1:300) | Plot at a scale of 1=0.3 | All dimensions to be verified on site

10 20 30 40 50 60 70 80

NORTH

BUILDINGS

1 FIRE STATION

SH1 GALV. IRON STORE SHED
SH2 GALV. IRON STORE SHED

Training area approximate extent

backfilled dam (approximate location)

A-12PW-2020-34

B-21CM-2028-185

GARDEN

FUEL PUMP

CONCRETE

UNDERGROUND FUEL TANK 15000 Ltr

Stormwater drain

CONCRETE PAVERS

VG

D-18CI-2022-30

GARDEN

PG

PERGOLA

PG

Stormwater drain

CONCRETE

FH

TOWER

CONCRETE

GARDEN

PG

B-21CM-2028-185

GRAND JUNCTION ROAD

GARDEN

1

VER

SH2

SH1

CONCRETE PAVERS

VERANDAH

Drain to sewer via separator

Truck wash down bay with drain to sewer via separator

CONCRETE PAVERS

Stormwater drain

PG

B-21CM-2028-185

Stormwater drain

GARDEN

GARDEN

C-12PW-2020-28

B-21CM-2028-185

FENCES *code-height-type-fail date-length (ms)*

CI corrugated iron	PI profiled iron
CM chain mesh	WM weld mesh
GT gal tube	NF not fenced
PG pedestrian gate	VG vehicle gate

WM *Water Meter* — *Fence junction*
GM *Gas Meter* — PMT *Pad mtd trans*

OAKDEN SAMFS FIRE STATION GRAND JUNCTION ROAD GILLES PLAINS 5086

Government of South Australia
Department for Transport, Energy and Infrastructure

Asset no.	*09164*	Client.	*ODEPT*
DTEI Office.	*ADELAIDE*	Sheet.	*1 of 1*
Created by.	*Archink*	*C Kneebone*	*May 2010*
Modified by.	*aTAM*	*K Tydeman*	*May 2019*
Audited by.	*Archink*	*A Bentley*	*May 2010*
Title details.	*refer layer " site-allotment " RT 8862539*		
Site area.	*0.4800 ha*	Accuracy.	*site survey*

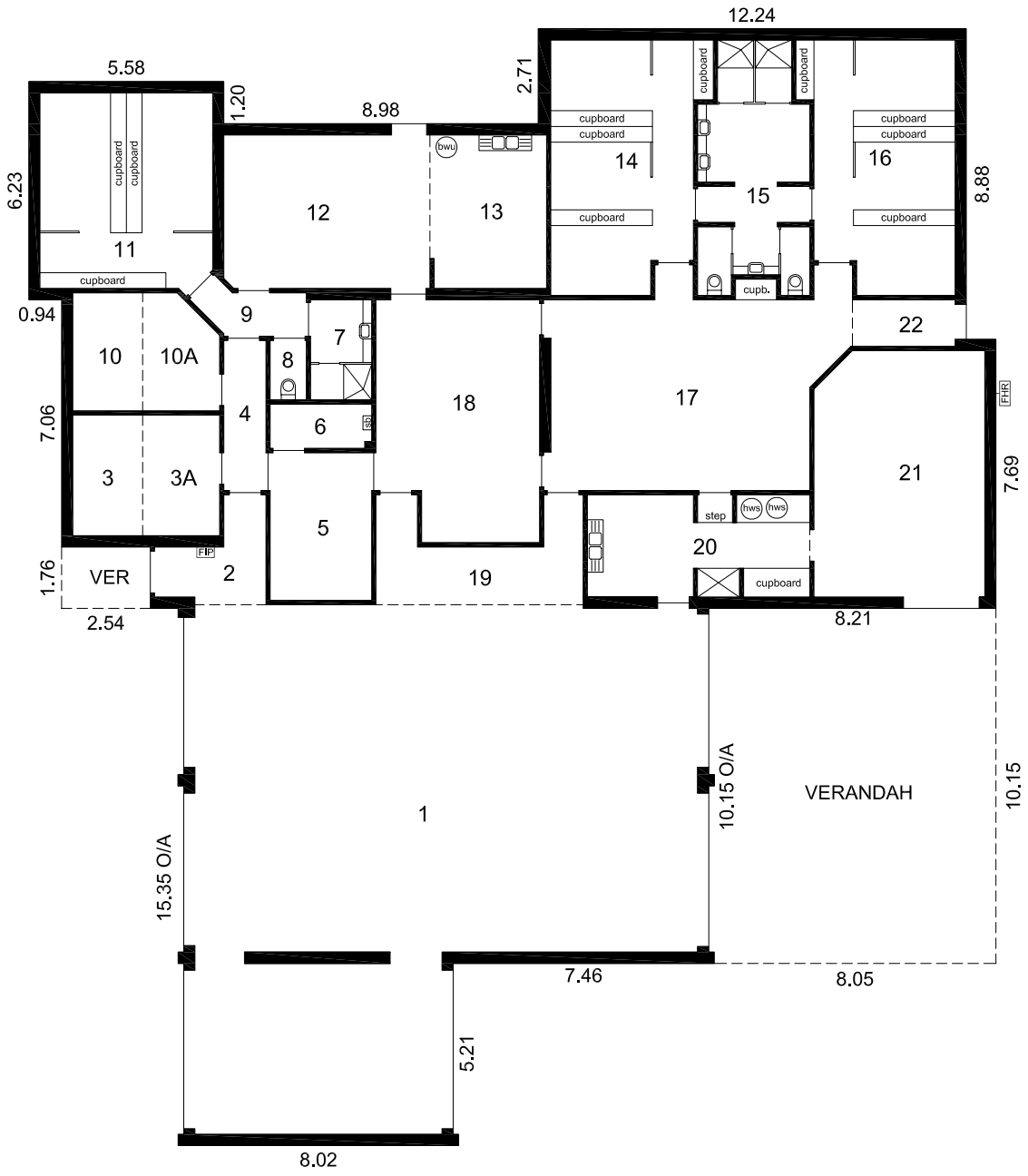
Strategic Asset Management Information System Plan

SAMIS 09164

1 10 20 30

Scale Bar Units in Metres (A4 1:200) Plot at a scale of 1=0.2 All dimensions to be verified on site

NORTH



Asset Name	**OAKDEN SAMFS**				
Building Use	**FIRE STATION**				
Created by.	*Archink*	Drawn	*C Kneebone*	Date	*May 2010*
Modified by.	*Archink*	Drawn	*A Bentley*	Date	*May 2010*
Bldg area m²	*597*	Ver area m²	*88*	Plan ref.	-

Government of South Australia
Department for Transport, Energy and Infrastructure

Strategic Asset Management Information System Plan

SAMIS 09164-01-1

intersection on Fosters Road, Grand Junction Road and traffic lights at Sudholz Road. We are also investigating a possible vehicle connection to Hilltop Drive.

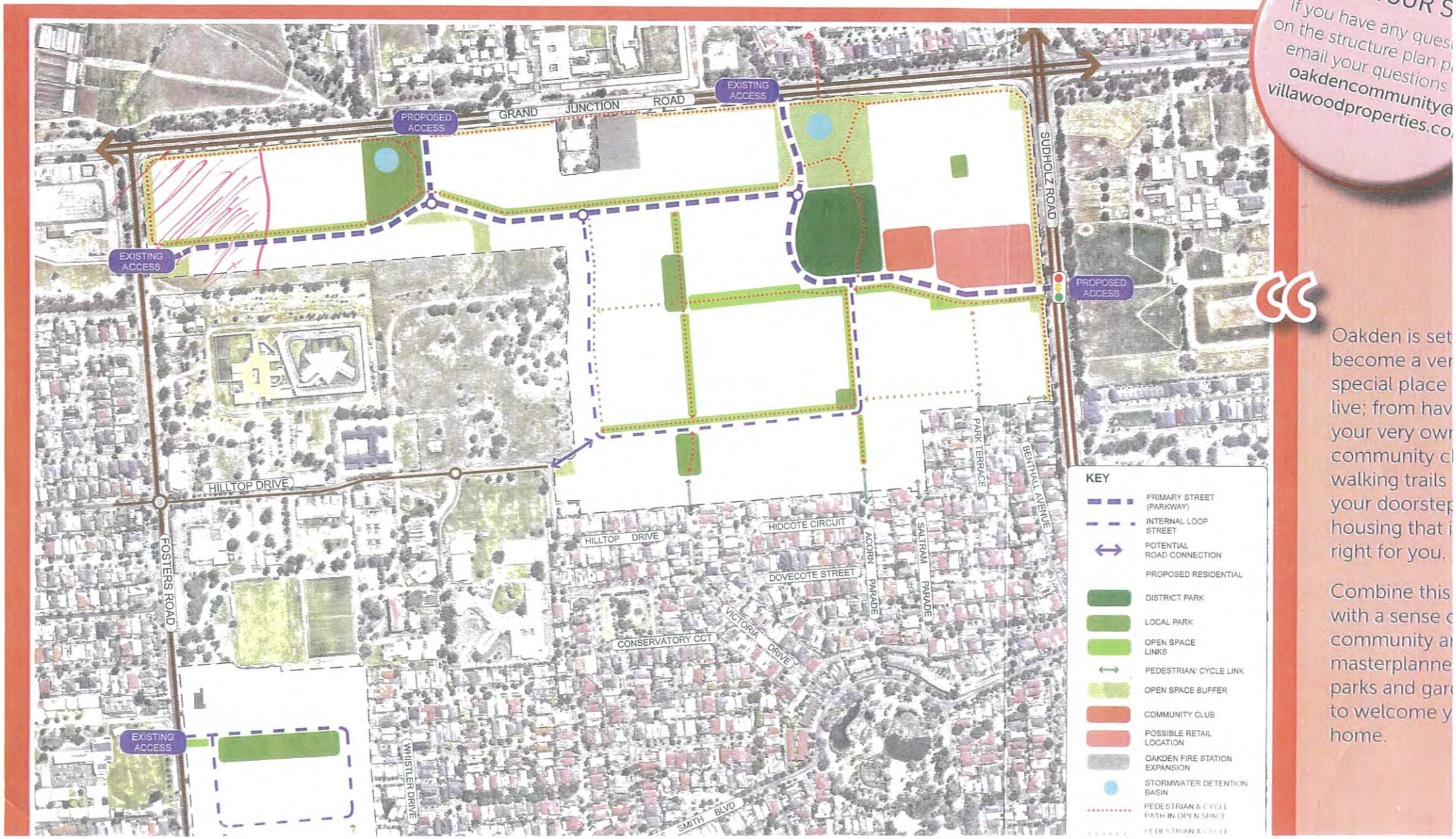
Open Space: Across the whole of the land, we expect the site to accommodate approximately 1,500 homes and over 8ha of open space.

Greening: Healthy significant and regulated trees will be retained with over 3,000 new trees expected to be planted throughout the development.

Demolition: All existing structures, other than the State Heritage listed Czechowicz House (former Superintendent's House), are to be removed.

State Government authorities.

Stage One Release: The first stage of allotme expected to be released to market in the mid 2022.



HAVE YOUR S

If you have any ques on the structure plan p email your questions **oakdencommunity@ villawoodproperties.co**

Oakden is set become a ver special place live; from hav your very own community cl walking trails your doorstep housing that i right for you.

Combine this with a sense c community ar masterplanne parks and gar to welcome y home.

Appendix D

Borelogs

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH01

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 18/07/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 5.00
Diameter (mm) 50

Easting 284449.17
Northing 6141429.04
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH01_0-0.1			SM - Silty SAND no plasticity, fine to medium, poorly graded, dark brown, some rootlets (Reworked NATURAL)	SM	L		0
0.2							SM	L		-0.2
0.4			BH01_0.3-0.4			SM - Silty SAND no plasticity, fine to medium, poorly graded, brown, trace fine gravel (Reworked NATURAL)	SM	L		-0.4
0.6						SC - Clayey SAND no plasticity, fine to medium, poorly graded, pale orange- brown (Reworked NATURAL)				-0.6
0.8										-0.8
1	PT		BH01_0.85-0.95			SC - Clayey SAND low plasticity, fine to medium, poorly graded, tan- brown (NATURAL - SOIL)	SM	L		-1
1.2										-1.2
1.4			BH01_1.4-1.5							-1.4
1.6										-1.6
1.8										-1.8
2			BH01_1.9-2.0			SC - Clayey SAND no plasticity, fine to medium, poorly graded, pale white- brown (NATURAL - SOIL)	D	L	Calcrete	-2
2.2										-2.2
2.4			BH01_2.25-2.35			SC - Sandy CLAY medium plasticity, tan with brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-2.4
2.6										-2.6
2.8										-2.8
3			BH01_2.85-3.0							-3
3.2										-3.2
3.4						CI - CLAY medium plasticity, grey- tan mottled red (NATURAL - SOIL)	SM	F		-3.4
3.6										-3.6
3.8										-3.8
4			BH01_3.9-4.0							-4
4.2										-4.2
4.4										-4.4
4.6										-4.6
4.8										-4.8
5			BH01_4.9-5.0							-5
5.2						Termination Depth at: 5.00 m. Target depth achieved.				-5.2

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 BH02

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 19/07/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 4.00
Diameter (mm) 50

Easting 284403.17
Northing 6141394.43
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH02_0-0.1 (FD04,FS04)			SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		0
0.2						SC - Clayey SAND no plasticity, fine to medium, poorly graded, brown, trace fine gravel (Reworked NATURAL)	SM	L		-0.2
0.4			BH02_0.4-0.5							-0.4
0.6			BH02_0.6-0.7							-0.6
0.8	PT		BH02_0.8-0.9			SC - Clayey SAND low plasticity, fine to medium, poorly graded, red- brown (NATURAL - SOIL)	SM	L		-0.8
1						CL - CLAY low to medium plasticity, pale brown- tan (NATURAL - SOIL)	M	S		-1
1.2										-1.2
1.4			BH02_1.4-1.5							-1.4
1.6				▽						-1.6
1.8										-1.8
2			BH02_1.9-2.0			CH - CLAY medium to high plasticity, pale grey- brown with tan (NATURAL - SOIL)	VM	S		-2
2.2										-2.2
2.4										-2.4
2.6										-2.6
2.8			BH02_2.7-2.8			CH - CLAY medium to high plasticity, pale tan- grey mottled red (NATURAL - SOIL)	VM	ST		-2.8
3										-3
3.2										-3.2
3.4										-3.4
3.6										-3.6
3.8			BH02_3.8-4.0							-3.8
4						Termination Depth at: 4.00 m. Water-logged SWL: 1.7m.				-4
4.2										-4.2
4.4										-4.4
4.6										-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 BH03

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 19/07/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 5.00
Diameter (mm) 50

Easting 284405.54
Northing 6141376.44
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH03_0-0.1			SM - Silty SAND no plasticity, fine to medium, poorly graded, brown, trace rootlets (Reworked NATURAL)	SM	L		0
0.2										-0.2
0.4			BH03_0.3-0.4							-0.4
0.6			BH03_0.5-0.6			SP - SAND fine to medium, poorly graded, pale yellow- tan, with fine to medium gravel (FILL)	SM	L		-0.6
0.8	PT					SM - Silty SAND fine to medium, poorly graded, red-brown, trace wood (NATURAL - SOIL)	SM			-0.8
1			BH03_0.9-1.0							-1
1.2						SC - Sandy CLAY low to medium plasticity, pale brown- tan, fine to medium, poorly graded sand (NATURAL - SOIL)	M	S		-1.2
1.4										-1.4
1.6			BH03_1.5-1.7							-1.6
1.8						CI - CLAY medium plasticity, tan mottled red- brown (NATURAL - SOIL)	M	F		-1.8
2										-2
2.2										-2.2
2.4										-2.4
2.6			BH03_2.6-2.7							-2.6
2.8										-2.8
3										-3
3.2			BH03_3.2-3.3							-3.2
3.4						CH - CLAY medium to high plasticity, pale tan- grey mottled orange- brown (NATURAL - SOIL)	SM	ST		-3.4
3.6										-3.6
3.8										-3.8
4										-4
4.2			BH03_4.2-4.3							-4.2
4.4										-4.4
4.6										-4.6
4.8										-4.8
5			BH03_4.9-5.0							-5
5.2						Termination Depth at: 5.00 m. Target depth achieved.				-5.2

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 BH05

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 19/07/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 5.00
Diameter (mm) 50

Easting 284416.98
Northing 6141364.16
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
0	DC		BH05_PAVER			PAVER				0
0.2	HA		BH05_0.08-0.18			SP - Gravelly SAND no plasticity, fine to coarse, poorly graded, pale brown, subangular, fine to medium, poorly graded gravel (FILL)	SM	L		-0.2
0.4			BH05_0.4-0.55							-0.4
0.6						SC - Sandy CLAY low to medium plasticity, pale brown with grey- white, some fine gravel, fine to medium, poorly graded sand (Reworked NATURAL)	SM	S		-0.6
0.8	PT		BH05_0.75-0.85							-0.8
1						CL - CLAY low to medium plasticity, pale grey- brown mottled black (NATURAL - SOIL)	SM	ST		-1
1.2										-1.2
1.4			BH05_1.25-1.35							-1.4
1.6										-1.6
1.8										-1.8
2										-2
2.2										-2.2
2.4			BH05_2.25-2.35							-2.4
2.6										-2.6
2.8										-2.8
3			BH05_3.0-3.15							-3
3.2						CI - CLAY medium plasticity, pale grey- tan mottled red (NATURAL - SOIL)	SM	VST		-3.2
3.4										-3.4
3.6										-3.6
3.8										-3.8
4			BH05_4.0-4.15							-4
4.2										-4.2
4.4										-4.4
4.6										-4.6
4.8										-4.8
5			BH05_4.9-5.0							-5
5.2						Termination Depth at: 5.00 m. Target depth achieved.				-5.2

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 BH06

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 18/07/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 5.00
Diameter (mm) 50

Easting 284423.69
Northing 6141358.54
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH06_0-0.1			SM - Sandy SILT no plasticity, dark brown, trace rootlets, fine to medium, poorly graded sand (Reworked NATURAL)	SM	L		0
0.2										-0.2
0.4			BH06_0.4-0.5			SC - Clayey SAND low plasticity, poorly graded, brown, trace fine gravel (Reworked NATURAL)	SM	L		-0.4
0.6						SC - Clayey SAND low plasticity, fine to medium, poorly graded, tan- brown (NATURAL - SOIL)	SM	L		-0.6
0.8	PT									-0.8
1			BH06_0.9-1.0							-1
1.2										-1.2
1.4										-1.4
1.6			BH06_1.5-1.6							-1.6
1.8						SC - Sandy CLAY low plasticity, tan- white, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	S	Calcrete	-1.8
2			BH06_1.9-2.0							-2
2.2						CL - CLAY low to medium plasticity, tan- brown (NATURAL - SOIL)	SM	F		-2.2
2.4			BH06_2.4-2.5							-2.4
2.6										-2.6
2.8										-2.8
3			BH06_2.9-3.0							-3
3.2										-3.2
3.4			BH06_3.3-3.4							-3.4
3.6						CI - CLAY medium plasticity, grey- tan mottled red (NATURAL - SOIL)	SM	ST		-3.6
3.8										-3.8
4										-4
4.2										-4.2
4.4			BH06_4.4-4.5							-4.4
4.6										-4.6
4.8										-4.8
5			BH06_4.9-5.0							-5
5.2						Termination Depth at: 5.00 m. Target depth achieved.				-5.2

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 BH07

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 18/07/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 5.00
Diameter (mm) 50

Easting 284439.14
Northing 6141381.6
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
0	DC		BH07_PAVER			PAVER				0
0.2	HA		BH07_0.08-0.2 (FS02, FD02)			SP - SAND no plasticity, fine to coarse, poorly graded, orange- brown, with fine to medium gravel (FILL)	M	L		-0.2
			BH07_0.25-0.35							
0.4						SC - Sandy CLAY low plasticity, tan- brown, fine to medium, poorly graded sand (Reworked NATURAL)	SM	S		-0.4
0.6										-0.6
0.8	PT		BH07_0.8-0.9							-0.8
1										-1
1.2			BH07_1.1-1.25							-1.2
1.4						SC - Sandy CLAY low to medium plasticity, tan- brown mottled orange, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-1.4
1.6										-1.6
1.8			BH07_1.65-1.75							-1.8
2										-2
2.2			BH07_2.25-2.35							-2.2
2.4										-2.4
2.6										-2.6
2.8			BH07_2.8-2.9							-2.8
3						CH - CLAY medium to high plasticity, tan mottled red (NATURAL - SOIL)	SM	F		-3
3.2										-3.2
3.4										-3.4
3.6										-3.6
3.8			BH07_3.8-3.9							-3.8
4										-4
4.2										-4.2
4.4										-4.4
4.6										-4.6
4.8										-4.8
5			BH07_4.9-5.0							-5
5.2						Termination Depth at: 5.00 m. Target depth achieved.				-5.2

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 BH08

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 18/07/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 5.00
Diameter (mm) 50

Easting 284444.23
Northing 6141359.72
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH08_0-0.1			SM - Sandy SILT low plasticity, dark brown, some rootlets, fine to medium, poorly graded sand (Reworked NATURAL)	M	S		0
0.2							M	S		-0.2
0.4			BH08_0.37-0.45			SC - Clayey SAND low plasticity, fine to medium, poorly graded, brown (Reworked NATURAL)	M	S		-0.4
0.6	PT					SC - Clayey SAND low plasticity, fine to medium, poorly graded, orange- brown, trace rootlets (Reworked NATURAL)	SM	S		-0.6
0.8			BH08_0.8-0.9			SC - Sandy CLAY low plasticity, tan- brown, trace fine gravel, fine to medium, poorly graded sand (NATURAL - SOIL)				-0.8
1							SM	S	Calcrete	-1
1.2						SC - Sandy CLAY low plasticity, white- brown, some fine gravel, fine to medium, poorly graded sand (NATURAL - SOIL)				-1.2
1.4										-1.4
1.6										-1.6
1.8										-1.8
2			BH08_1.9-2.0							-2
2.2						CH - CLAY medium to high plasticity, grey- tan mottled red (NATURAL - SOIL)	SM	ST		-2.2
2.4										-2.4
2.6										-2.6
2.8										-2.8
3			BH08_2.9-3.0							-3
3.2										-3.2
3.4										-3.4
3.6										-3.6
3.8										-3.8
4			BH08_3.9-4.0							-4
4.2										-4.2
4.4										-4.4
4.6										-4.6
4.8										-4.8
5			BH08_4.9-5.0							-5
5.2						Termination Depth at: 5.00 m. Target depth achieved.				-5.2

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-GROUNDWATER

MONITORING WELL MW01

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/07/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Drill Method
Total Depth (m) 4.00
Casing Diameter (mm) 50

Easting, Northing 284397, 6141423
Grid Ref GDA94_MGA_zone_54
Elevation
TOC mAHD -
Logged By Terrence Wilson
Checked By Tom Duncan

Permit No. 441676 **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		MW01_0-0.1		Gatic / Concrete		SM - Sandy SILT low plasticity, dark brown, some mulch, fine to medium, poorly graded sand (Reworked NATURAL)	M	S		0
0.2								M	L		-0.2
0.4			MW01_0.4-0.5		Bentonite		SC - Clayey SAND low plasticity, fine to medium, poorly graded, brown (Reworked NATURAL)				-0.4
0.6											-0.6
0.8	PT		MW01_0.65-0.75				SC - Sandy CLAY low to medium plasticity, pale brown- tan, fine to medium, poorly graded sand (NATURAL - SOIL)	VM			-0.8
1			MW01_0.9-1.0								-1
1.2											-1.2
1.4				▽							-1.4
1.6			MW01_1.5-1.7								-1.6
1.8							CH - CLAY medium to high plasticity, pale brown- tan with grey (NATURAL - SOIL)	W	F		-1.8
2											-2
2.2					Gravel						-2.2
2.4											-2.4
2.6			MW01_2.6-2.7								-2.6
2.8											-2.8
3	SFA		MW01_2.9-3.0								-3
3.2											-3.2
3.4											-3.4
3.6											-3.6
3.8											-3.8
4			MW01_3.9-4.0								-4
							Termination Depth at: 4.00 m. Target depth achieved.				

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 (BH04)

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 18/07/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Drill Method
Total Depth (m) 4.00
Casing Diameter (mm) 50

Easting, Northing 284418.5, 6141375.59
Grid Ref GDA94_MGA_zone_54
Elevation
TOC mAHD -
Logged By Terrence Wilson
Checked By Tom Duncan

Permit No. 441674 **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: MW02	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	DC		BH04_PAVER		Gatic		PAVER				0
0.2	HA		BH04_0.08-0.18		Concrete		SP - SAND no plasticity, fine to coarse, poorly graded, orange- brown, with fine to medium gravel (possible NATURAL - BEDROCK)	M	L		-0.2
0.4			BH04_0.3-0.4		Bentonite		SC - Sandy CLAY low plasticity, red-brown, fine to medium, poorly graded sand (FILL)	SM	S		-0.4
0.6			BH04_0.5-0.65								-0.6
0.8	PT						SC - Sandy CLAY red- brown, fine to medium, poorly graded sand (possible NATURAL - SOIL)				-0.8
1			BH04_1.0-1.15								-1
1.2							CH - CLAY medium to high plasticity, brown- tan with pale grey (NATURAL - SOIL)	W	F		-1.2
1.4											-1.4
1.6			BH04_1.55-1.65								-1.6
1.8				▽							-1.8
2											-2
2.2					Gravel						-2.2
2.4											-2.4
2.6			BH04_2.5-2.6								-2.6
2.8											-2.8
3			BH04_2.9-3.0								-3
3.2	SFA										-3.2
3.4											-3.4
3.6											-3.6
3.8											-3.8
4											-4
							Termination Depth at: 4.00 m. Target depth achieved.				

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-SOIL BORE

SOIL BORE MW02

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/07/2023 -

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m)
Diameter (mm) 50

Easting 284425
Northing 6141371
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
0	DC		MW02_PAVER			PAVER				0
0.2	HA		MW02_0.08-0.2 (FD06,FS06)			SP - Gravelly SAND fine to coarse, poorly graded, pale tan- brown, subangular, fine to medium, poorly graded gravel (FILL)	SM	L		-0.2
0.4			MW02_0.3-0.4							-0.4
			MW02_0.4-0.55			SC - Sandy CLAY low plasticity, red- brown, rounded, fine to medium, poorly graded sand (FILL)	SM	S		
0.6						SC - Sandy CLAY low plasticity, tan- brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	S		-0.6
0.8	PT									-0.8
1			MW02_0.9-1.0			CI - CLAY medium plasticity, pale brown- tan (NATURAL - SOIL)	M	S		-1
1.2										-1.2
1.4										-1.4
1.6										-1.6
1.8			MW02_1.8-1.9							-1.8
2						CI - CLAY medium plasticity, tan- brown (NATURAL - SOIL)	M	F		-2
2.2										-2.2
2.4										-2.4
2.6										-2.6
2.8										-2.8
3			MW02_2.9-3.0			CI - CLAY medium plasticity, tan- brown mottled dark brown (NATURAL - SOIL)	SM	F		-3
3.2										-3.2
3.4										-3.4
3.6										-3.6
3.8										-3.8
4			MW02_3.9-4.0			CI - CLAY medium plasticity, tan- brown mottled orange- brown (NATURAL - SOIL)	SM	VST		-4
4.2										-4.2
4.4										-4.4
4.6										-4.6
4.8										-4.8
5			MW02_4.9-5.0							-5
5.2										-5.2

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 MW03

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/07/2023 -

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 15.00
Diameter (mm) 50

Easting 284451
Northing 6141377
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
	DC		MW03_PAVER (FD05,FS05)			PAVER	M	L		
	HA		MW03_0.08-0.18			SP - Gravelly SAND fine to coarse, poorly graded, pale orange- brown, subangular, fine to medium, poorly graded gravel (FILL)	SM	MD		
			MW03_0.3-0.4							
1	PT		MW03_0.9-1.0							-1
			MW03_1.4-1.5			SC - Clayey SAND low plasticity, fine to medium, poorly graded, tan- brown (possible NATURAL - SOIL)				
2						CH - CLAY medium to high plasticity, pale grey- brown (NATURAL - SOIL)	M	F		-2
			MW03_2.4-2.5							
3			MW03_3.0-3.15							-3
						CH - CLAY high plasticity, pale brown- grey mottled red (NATURAL - SOIL)	M	ST		
4			MW03_3.9-4.0							-4
5			MW03_4.9-5.0							-5
6			MW03_5.9-6.0							-6
7			MW03_6.9-7.0							-7
			MW03_7.6-7.7							
8						SC - Clayey SAND no plasticity, fine to coarse, poorly graded, red- brown with pale grey (NATURAL - SOIL)	SM	MD		-8
			MW03_8.8-9.0							
9						SP - SAND fine to coarse, poorly graded, orange- brown, some fine to coarse gravel (NATURAL - SOIL)	SM	L		-9
			MW03_9.8-9.9							
10						SP - SAND fine to coarse, poorly graded, grey with orange- brown, some fine to medium gravel (NATURAL - SOIL)	SM	L		-1
			MW03_10.9-11.0							
11	SFA									-11
12										-12
13										-13
14										-14
15						Termination Depth at: 15.00 m				-15

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 BH09

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 23/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 1.00
Diameter (mm) 50

Easting 284396.47
Northing 6141417.45
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH09_0.01-0.1			GRASS				0
0.05						SC - Clayey SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	M	L		-0.05
0.1										-0.1
0.15										-0.15
0.2			BH09_0.2-0.3							-0.2
0.25										-0.25
0.3						CI - CLAY medium plasticity, brown- tan (NATURAL - SOIL)	W	F		-0.3
0.35										-0.35
0.4			BH09_0.4-0.5							-0.4
0.45										-0.45
0.5										-0.5
0.55										-0.55
0.6										-0.6
0.65										-0.65
0.7				▽						-0.7
0.75										-0.75
0.8										-0.8
0.85										-0.85
0.9			BH09_0.9-1.0							-0.9
0.95										-0.95
1						Termination Depth at: 1.00 m. Target depth achieved.				-1

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 BH10

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 23/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284397.3
Northing 6141398.54
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
0.02			BH10_0.01-0.1			SC - Sandy CLAY medium to high plasticity, dark brown, fine to medium, poorly graded sand (Reworked NATURAL)	SM	F		-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1										-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2			BH10_0.2-0.3			CH - CLAY medium to high plasticity, brown- tan (NATURAL - SOIL)	M	F		-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH10_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5										-0.5
0.52						Termination Depth at: 0.50 m. Target depth achieved.				-0.52

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 BH11

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 23/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 1.00
Diameter (mm) 50

Easting 284397.38
Northing 6141384.2
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0			BH11_0.0-0.1			SC - Sandy CLAY medium to high plasticity, fine to medium, poorly graded, dark brown, poorly graded sand (Reworked NATURAL)	SM	L		0
0.05										-0.05
0.1										-0.1
0.15						SC - Sandy CLAY medium plasticity, orange- brown, poorly graded sand (NATURAL - SOIL)	SM	F		-0.15
0.2										-0.2
0.25			BH11_0.25-0.35							-0.25
0.3										-0.3
0.35						CH - CLAY medium to high plasticity, fine to medium, poorly graded, brown- tan (NATURAL - SOIL)	W	S		-0.35
0.4										-0.4
0.45										-0.45
0.5										-0.5
0.55										-0.55
0.6										-0.6
0.65										-0.65
0.7										-0.7
0.75				▽						-0.75
0.8										-0.8
0.85										-0.85
0.9			BH11_0.9-1.0							-0.9
0.95										-0.95
1	HA					Termination Depth at: 1.00 m. Target depth achieved.				-1

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 BH12

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.70
Diameter (mm) 50

Easting 284399.22
Northing 6141360.16
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA		BH12_0.01-0.1			GRASS SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		
0.1						SC - Sandy CLAY low to medium plasticity, pale brown- tan, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	S		-0.1
0.4			BH12_0.4-0.5							-0.4
0.6			BH12_0.6-0.7 (FD02,FS02)							-0.6
0.7						Termination Depth at: 0.70 m. Target depth achieved.				-0.7

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 BH13

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284398.85
Northing 6141334.24
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
0.02			BH13_0.01-0.1			SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1			BH13_0.1-0.2							-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2						SC - Sandy CLAY low plasticity, pale brown- tan (NATURAL - SOIL)	SM	S		-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH13_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5
0.52										-0.52

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 BH14

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 23/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284361.85
Northing 6141412.46
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA					GRASS				0
0.02			BH14_0.01-0.1			SC - Clayey SAND poorly graded, dark brown, some rootlets (Reworked NATURAL)	M	L		-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1			BH14_0.1-0.15							-0.1
0.12										-0.12
0.14										-0.14
0.16						SC - Sandy CLAY medium plasticity, dark red- brown, fine to medium, poorly graded sand (possible NATURAL - SOIL)	M	F		-0.16
0.18										-0.18
0.2			BH14_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3						CL - CLAY low to medium plasticity, pale brown- tan, trace medium gravel (NATURAL - SOIL)	M	F		-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH14_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5
0.52										-0.52

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 BH15

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 23/08/2023

Drill Co. GHD
Driller Joshua Anderson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284362.47
Northing 6141394.59
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
0.02			BH15_0.01-0.1			SC - Clayey SAND low to medium plasticity, dark brown, some rootlets (Reworked NATURAL)	M			-0.02
0.04										-0.04
0.06										-0.06
0.08						SC - Clayey SAND low to medium plasticity, dark brown, some fine to medium gravel (possible NATURAL - SOIL)	M			-0.08
0.1			BH15_0.1-0.2							-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2			BH15_0.2-0.4			SC - Sandy CLAY dark red- brown (possible NATURAL - SOIL)	M			-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH15_0.4-0.5			CL - CLAY low plasticity, pale tan- brown (possible NATURAL - SOIL)	M	ST		-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5
0.52										-0.52

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 BH16

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 23/08/2023

Drill Co. GHD
Driller Joshua Anderson
Rig Type Hand Auger
Total Depth (m) 0.60
Diameter (mm) 50

Easting 284366.2
Northing 6141377.89
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA					GRASS				0
			BH16_0.01-0.1			SC - Sandy CLAY medium plasticity, dark brown, some rootlets (Reworked NATURAL)	M	L		
0.05										-0.05
0.1			BH16_0.1-0.2 (FD01,FS01)			SC - Sandy CLAY low to medium plasticity, dark red-brown (possible NATURAL - SOIL)	M	F		-0.1
0.15										-0.15
0.2										-0.2
0.25										-0.25
0.3										-0.3
0.35										-0.35
0.4			BH16_0.4-0.6			CL - CLAY low plasticity, pale tan- brown (possible NATURAL - SOIL)	M	F		-0.4
0.45										-0.45
0.5										-0.5
0.55										-0.55
0.6						Termination Depth at: 0.60 m. Target depth achieved.				-0.6

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 BH17

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 23/08/2023

Drill Co. GHD
Driller Joshua Anderson
Rig Type Hand Auger
Total Depth (m) 0.42
Diameter (mm) 50

Easting 284367.34
Northing 6141354.5
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
0.02			BH17_0.01-0.1			SC - Sandy CLAY low to medium plasticity, dark brown, some rootlets (Reworked NATURAL)	M	L		-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1			BH17_0.1-0.25			SC - Sandy CLAY low plasticity, dark red- brown, with coarse gravel	M	F		-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2										-0.2
0.22										-0.22
0.24										-0.24
0.26			BH17_0.25-0.42			CL - CLAY low plasticity, dark red- brown, with coarse gravel (Reworked NATURAL)	M	ST		-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4										-0.4
0.42						Termination Depth at: 0.42 m. Refusal on rock.				-0.42
0.44										-0.44

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 BH18

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 23/08/2023

Drill Co. GHD
Driller Joshua Anderson
Rig Type Hand Auger
Total Depth (m) 1.00
Diameter (mm) 50

Easting 284370.38
Northing 6141334.84
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH18_0.01-0.15			GRASS				0
0.05						SC - Sandy CLAY low plasticity, dark brown, some rootlets (Reworked NATURAL)	M	L		-0.05
0.1										-0.1
0.15			BH18_0.15-0.25			SC - Sandy CLAY low to medium plasticity, dark red-brown (possible NATURAL - SOIL)	M	F		-0.15
0.2										-0.2
0.25			BH18_0.25-0.35			CI - CLAY medium plasticity, brown- tan, with fine to coarse gravel (possible NATURAL - SOIL)				-0.25
0.3										-0.3
0.35			BH18_0.9-1.0			CI - CLAY medium plasticity, pale tan- brown, with medium to coarse sand (possible NATURAL - SOIL)	M	F		-0.35
0.4										-0.4
0.45										-0.45
0.5										-0.5
0.55										-0.55
0.6										-0.6
0.65										-0.65
0.7										-0.7
0.75										-0.75
0.8										-0.8
0.85										-0.85
0.9										-0.9
0.95										-0.95
1						Termination Depth at: 1.00 m. Target depth achieved.				-1

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 BH19

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284345.5
Northing 6141333.18
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
0.02			BH19_0.01-0.1			SC - Sandy CLAY medium plasticity, dark brown, trace rootlets, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1										-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2			BH19_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3						CI - CLAY medium plasticity, pale tan (NATURAL - SOIL)	SM	F		-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH19_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5
0.52										-0.52

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 BH20

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284343.96
Northing 6141354.54
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
0.02			BH20_0.01-0.1			SC - Sandy CLAY low plasticity, fine, poorly graded, dark brown, trace rootlets (NATURAL - SOIL)	SM	F	no odour no staining, trace coal refuse	-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1										-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2			BH20_0.2-0.3			CL - CLAY low to medium plasticity, pale tan (NATURAL - SOIL)	SM	F		-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH20_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5
0.52										-0.52

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 BH21

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284342.91
Northing 6141378.04
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA					GRASS				0
0.02			BH21_0.01-0.11 (FS03, FD03)			SC - Sandy CLAY low to medium plasticity, dark brown, trace rootlets (NATURAL - SOIL)	SM			-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1										-0.1
0.12										-0.12
0.14										-0.14
0.16						SC - Sandy CLAY medium plasticity, dark red- brown (NATURAL - SOIL)	SM	F		-0.16
0.18										-0.18
0.2			BH21_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3						CI - CLAY medium plasticity, pale tan (NATURAL - SOIL)	SM	F		-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH21_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5
0.52										-0.52

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 BH22

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284341.96
Northing 6141392.87
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
0.02			BH22_0.01-0.11			SC - Sandy CLAY low to medium plasticity, dark brown, trace rootlets (NATURAL - SOIL)	SM	F		-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1										-0.1
0.12										-0.12
0.14										-0.14
0.16						SC - Sandy CLAY low to medium plasticity, pale tan (possible NATURAL - SOIL)	SM	F		-0.16
0.18										-0.18
0.2			BH22_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH22_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5										-0.5
0.52						Termination Depth at: 0.50 m. Target depth achieved.				-0.52

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 BH23

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.32
Diameter (mm) 50

Easting 284338.74
Northing 6141410.59
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
			BH23_0.01-0.11			SC - Sandy CLAY low plasticity, dark brown, trace rootlets (NATURAL - SOIL)	SM	F		
0.02										-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1			BH23_0.1-0.2			SC - Sandy CLAY dark red- brown (NATURAL - SOIL)				-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2			BH23_0.2-0.32			CL - CLAY low plasticity, dark red- brown, trace silty clay (NATURAL - SOIL)	SM	F		-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3										-0.3
0.32						Termination Depth at: 0.32 m. Refusal on rock.				-0.32

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

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.60
Diameter (mm) 50

Easting 284411.97
Northing 6141333.16
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
						GRASS				
			BH24_0.01-0.11			SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		
0.05										-0.05
0.1						SM - Silty SAND medium, poorly graded, pale brown (Reworked NATURAL)	SM	L		-0.1
0.15										-0.15
0.2						SM - Silty SAND medium, poorly graded, pale tan (NATURAL - SOIL)	SM	L		-0.2
0.25			BH24_0.25-0.35							-0.25
0.3										-0.3
0.35										-0.35
0.4										-0.4
0.45										-0.45
0.5			BH24_0.5-0.6							-0.5
0.55										-0.55
0.6						Termination Depth at: 0.60 m. Target depth achieved.				-0.6

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 BH25

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284433.5
Northing 6141336.51
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
0.02			BH25_0.01-0.11			CI - Silty CLAY medium plasticity, dark brown, trace rootlets (Reworked NATURAL)	SM	S		-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1						SC - Sandy CLAY medium plasticity, dark red- brown (NATURAL - SOIL)	SM	D		-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2			BH25_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH25_0.4-0.5 (FD04, FS04)							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5										-0.5
0.52						Termination Depth at: 0.50 m. Target depth achieved.				-0.52

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 BH26

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284461.34
Northing 6141339.8
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
0.02			BH26_0.01-0.06			SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		-0.02
0.04										-0.04
0.06						SC - Clayey SAND fine to medium, poorly graded, dark brown (Reworked NATURAL)	SM	MD		-0.06
0.08										-0.08
0.1			BH26_0.1-0.2							-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2										-0.2
0.22										-0.22
0.24										-0.24
0.26						CI - Silty CLAY low to medium plasticity, dark red-brown (NATURAL - SOIL)	SM	VD		-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH26_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5										-0.5
0.52						Termination Depth at: 0.50 m. Target depth achieved.				-0.52

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 BH27

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284462.86
Northing 6141330.09
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					SM - Silty SAND fine to medium, poorly graded, dark brown- red, trace (Reworked NATURAL)	D	L		
0.02			BH27_0.01-0.11							-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1										-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2										-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3			BH27_0.3-0.4			SM - Silty SAND fine to medium, poorly graded, dark red, trace fine gravel (Reworked NATURAL)	D	L		-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH27_0.4-0.45							-0.4
0.42										-0.42
0.44										-0.44
0.46						SM - Silty SAND fine to medium, poorly graded, pale red- white (NATURAL - SOIL)	D	L		-0.46
0.48										-0.48
0.5										-0.5
0.52						Termination Depth at: 0.50 m. Target depth achieved.				-0.52

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 BH28

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.30
Diameter (mm) 50

Easting 284436.68
Northing 6141326.35
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
			BH28_0.01-0.11			SC - Clayey SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		
0.02										-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1						CI - Silty CLAY low to medium plasticity, dark red-brown (Reworked NATURAL)	SM	D		-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2			BH28_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3						Termination Depth at: 0.30 m. Refusal on rock.				-0.3

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 BH29

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.30
Diameter (mm) 50

Easting 284414.08
Northing 6141323.68
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
			BH29_0.01-0.06			SM - Silty SAND fine to medium, poorly graded, dark brown (Reworked NATURAL)		VL		
0.02										-0.02
0.04										-0.04
						SM - Silty SAND fine to medium, poorly graded, dark brown- red (NATURAL - SOIL)	D	VL		
0.06										-0.06
0.08										-0.08
0.1			BH29_0.1-0.2							-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2										-0.2
0.22										-0.22
0.24										-0.24
			BH29_0.25-0.3			SM - Silty SAND fine to medium, poorly graded, dark white- brown, with rock fragments (NATURAL - SOIL)	D	L		
0.26										-0.26
0.28										-0.28
0.3										-0.3
						Termination Depth at: 0.30 m. Refusal on bedrock.				

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 BH30

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.30
Diameter (mm) 50

Easting 284415.93
Northing 6141306.3
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
			BH30_0.01-0.11			SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		
0.02										-0.02
0.04										-0.04
			BH30_0.05-0.15			SM - Silty SAND fine to medium, poorly graded, dark red- brown red- (NATURAL - SOIL)	D	L		
0.06										-0.06
0.08										-0.08
0.1										-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2										-0.2
0.22										-0.22
0.24										-0.24
			BH30_0.25-0.3			SM - Silty SAND fine to medium, poorly graded, mottled white- brown, with rock fragments (NATURAL - SOIL)	D	L		
0.26										-0.26
0.28										-0.28
0.3						Termination Depth at: 0.30 m. Refusal on bedrock.				-0.3

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 BH31

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.55
Diameter (mm) 50

Easting 284439.99
Northing 6141305.88
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
			BH31_0.01-0.11			SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		
0.05										-0.05
0.1										-0.1
0.15										-0.15
0.2										-0.2
0.25			BH31_0.25-0.35 (FD05, FS05)							-0.25
0.3										-0.3
0.35						SC - Clayey SAND fine to medium, poorly graded, dark brown- red (NATURAL - SOIL)	SM	L		-0.35
0.4			BH31_0.4-0.5							-0.4
0.45										-0.45
0.5										-0.5
0.55						Termination Depth at: 0.55 m. Target depth achieved.				-0.55

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 BH32

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 24/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284468.23
Northing 6141308.78
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA					SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (possible FILL)	D	L		-0
0.02			BH32_0.01-0.11							-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1						SM - Sandy SILT no plasticity, pale white- brown (possible FILL)	D	VL		-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2			BH32_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH32_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5
0.52										-0.52

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 BH33

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284480.99
Northing 6141412.61
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA					GRASS				0
0.02			BH33_0.01-0.1			SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1										-0.1
0.12										-0.12
0.14										-0.14
0.16						SC - Clayey SAND fine to medium, poorly graded, dark orange- brown (possible NATURAL - SOIL)	SM	MD		-0.16
0.18										-0.18
0.2			BH33_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3						SC - Sandy CLAY low to medium plasticity, pale brown- tan, with rock fragments, poorly graded sand (possible NATURAL - SOIL)	D	F		-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH33_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5
0.52										-0.52

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 BH34

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284480.56
Northing 6141396.28
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
0.02			BH34_0.01-0.05			SM - Silty SAND fine to medium, poorly graded, dark brown, with rootlets (Reworked NATURAL)	SM	L		-0.02
0.04										-0.04
0.06						SC - Clayey SAND fine to medium, poorly graded, dark brown, trace rootlets (possible NATURAL - SOIL)	SM	D		-0.06
0.08										-0.08
0.1										-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2			BH34_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH34_0.4-0.5			SC - Sandy CLAY low plasticity, mottled brown- tan (possible NATURAL - SOIL)	SM	F		-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5										-0.5
0.52						Termination Depth at: 0.50 m. Target depth achieved.				-0.52

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 BH35

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284486.37
Northing 6141378.99
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
0.02			BH35_0.01-0.1			SC - Clayey SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1										-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2										-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3						SC - Sandy CLAY low plasticity, dark orange- brown (possible NATURAL - SOIL)	SM	S		-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH35_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5										-0.5
0.52						Termination Depth at: 0.50 m. Target depth achieved.				-0.52

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 BH36

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284486.14
Northing 6141365.64
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA					GRASS				0
0.02			BH36_0.01-0.1			SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		-0.02
0.1						SC - Clayey SAND fine to medium, poorly graded, dark orange- brown (possible NATURAL - SOIL)	SM	D		-0.1
0.2			BH36_0.2-0.3							-0.2
0.34						SC - Sandy CLAY low plasticity, mottled white- tan (possible NATURAL - SOIL)	SM	F		-0.34
0.4			BH36_0.4-0.5							-0.4
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5
0.52										-0.52

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 BH37

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284490.12
Northing 6141350.12
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
0.02			BH37_0.01-0.1 (FD06, FS06)			SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	D	L		-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1										-0.1
0.12										-0.12
0.14										-0.14
0.16						SC - Clayey SAND fine to medium, poorly graded, dark orange- brown (possible NATURAL - SOIL)	SM	D		-0.16
0.18										-0.18
0.2			BH37_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH37_0.4-0.5			SC - Sandy CLAY low plasticity, mottled white- tan, with rock fragments (possible NATURAL - SOIL)	D	F		-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5										-0.5
0.52						Termination Depth at: 0.50 m. Target depth achieved.				-0.52

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 BH38

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284508.8
Northing 6141351.22
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH38_0.0-0.1			SP - Gravelly SAND fine to medium, poorly graded, dark yellow- tan, subangular, fine to medium, poorly graded gravel (FILL)	SM	L		0
0.1						SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (possible NATURAL - SOIL)	SM	D		-0.1
0.2			BH38_0.2-0.3							-0.2
0.3						SC - Sandy CLAY low to medium plasticity, mottled white- brown (possible NATURAL - SOIL)	SM	F		-0.3
0.4			BH38_0.4-0.5							-0.4
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5

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 BH39

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284507.4
Northing 6141367.98
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH39_0.0-0.05			SP - Gravelly SAND poorly graded, pale yellow- tan, subangular, fine to medium, poorly graded gravel (FILL)	M	L		0
0.02										-0.02
0.04										-0.04
0.06			BH39_0.05-0.1			GP - Sandy GRAVEL fine to medium, poorly graded, subangular, dark blue- brown, poorly graded sand (Reworked NATURAL)	M	D		-0.06
0.08										-0.08
0.1										-0.1
0.12						SM - Silty SAND fine to medium, poorly graded, dark brown (possible NATURAL - SOIL)	M			-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2			BH39_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3						SC - Sandy CLAY low to medium plasticity, dark red-brown (possible NATURAL - SOIL)	M	F		-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH39_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5
0.52										-0.52

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 BH40

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284506.43
Northing 6141382.9
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH40_0.0-0.1			SM - Silty SAND fine to medium, poorly graded, dark brown, some rootlets, trace fine to medium gravel (Reworked NATURAL)	SM	MD		0
0.02										-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1										-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2			BH40_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3						SP - SAND medium, poorly graded, mottled white-brown, fine to coarse sand (FILL)	SM	L		-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH40_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5
0.52										-0.52

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 BH41

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 1.00
Diameter (mm) 50

Easting 284502.06
Northing 6141399.82
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0			BH41_0.01-0.1			GRASS				0
0.05						SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		-0.05
0.1						SC - Sandy CLAY low to medium plasticity, orange-brown (possible NATURAL - SOIL)	M	F		-0.1
0.15										-0.15
0.2										-0.2
0.25										-0.25
0.3										-0.3
0.35										-0.35
0.4										-0.4
0.45			BH41_0.45-0.55							-0.45
0.5										-0.5
0.55						CL - CLAY low to medium plasticity, pale tan- brown, some (possible NATURAL - SOIL)	SM	F		-0.55
0.6										-0.6
0.65										-0.65
0.7										-0.7
0.75										-0.75
0.8										-0.8
0.85										-0.85
0.9			BH41_0.9-1.0 (FD07, FS07)							-0.9
0.95										-0.95
1						Termination Depth at: 1.00 m. Target depth achieved.				-1

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 BH42

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284503.61
Northing 6141415.51
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH42_0.0-0.1			SM - Silty SAND fine to medium, poorly graded, dark brown, some rootlets (Reworked NATURAL)	SM	L		0
0.1			BH42_0.2-0.3			SC - Clayey SAND fine to medium, poorly graded, orange- brown (possible NATURAL - SOIL)	SM	D		-0.1
0.3			BH42_0.4-0.5			CL - CLAY low to medium plasticity, pale brown- tan (possible NATURAL - SOIL)	SM	F		-0.3
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5

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 BH43

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284526.87
Northing 6141415.41
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
	HA					GRASS				
0.02			BH43_0.01-0.1			SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1						SC - Sandy CLAY low to medium plasticity, pale brown- tan (possible NATURAL - SOIL)	SM	F		-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2			BH43_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH43_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5										-0.5
0.52						Termination Depth at: 0.50 m. Target depth achieved.				-0.52

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 BH44

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284523.73
Northing 6141403.5
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH44_0.0-1			SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	M	MD		0
0.14						SC - Sandy CLAY low to medium plasticity, orange-brown (possible NATURAL - SOIL)	M	F		-0.14
0.2			BH44_0.2-03							-0.2
0.4			BH44_0.4-0.5							-0.4
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5
0.52										-0.52

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 BH45

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284527.13
Northing 6141385.91
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH45_0.0-0.05			SM - Silty SAND fine to medium, poorly graded, dark brown, some rootlets (FILL)	SM	L		-0
0.02										-0.02
0.04										-0.04
0.06						SP - Gravelly SAND fine to medium, poorly graded, pale tan, subangular, poorly graded gravel (FILL)	SM	L		-0.06
0.08										-0.08
0.1			BH45_0.1-0.15							-0.1
0.12										-0.12
0.14										-0.14
0.16						GP - Sandy GRAVEL fine to medium, poorly graded, dark blue- brown (FILL)	W	L		-0.16
0.18										-0.18
0.2			BH45_0.2-0.24							-0.2
0.22										-0.22
0.24										-0.24
0.26						SC - Sandy CLAY low plasticity, dark orange- brown (possible NATURAL - SOIL)	SM	F		-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH45_0.4-0.5							-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5
0.52										-0.52

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 BH46

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284524.6
Northing 6141372.04
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH46_0.0-0.1 (FD08, FS08)			SM - Silty SAND fine to medium, poorly graded, dark brown, some fine to medium gravel (Reworked NATURAL)	SM	D		0
0.02										-0.02
0.04										-0.04
0.06										-0.06
0.08										-0.08
0.1										-0.1
0.12										-0.12
0.14										-0.14
0.16										-0.16
0.18										-0.18
0.2			BH46_0.2-0.3							-0.2
0.22										-0.22
0.24										-0.24
0.26										-0.26
0.28										-0.28
0.3										-0.3
0.32										-0.32
0.34										-0.34
0.36										-0.36
0.38										-0.38
0.4			BH46_0.4-0.5			SC - Sandy CLAY low to medium plasticity, orange-brown (possible NATURAL - SOIL)	SM	F		-0.4
0.42										-0.42
0.44										-0.44
0.46										-0.46
0.48										-0.48
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5
0.52										-0.52

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 BH47

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 25/08/2023

Drill Co. GHD
Driller Terrence Wilson
Rig Type Hand Auger
Total Depth (m) 0.50
Diameter (mm) 50

Easting 284529.12
Northing 6141354.53
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Louise Wright
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH47_0.0-0.1			GP - Sandy GRAVEL fine to medium, poorly graded, pale brown, subangular, poorly graded gravel (FILL)	SM	L		0
0.12						SM - Silty SAND fine to medium, poorly graded, dark brown (Reworked NATURAL)	SM	MD		-0.12
			BH47_0.15-0.25							
0.24						SC - Sandy CLAY low to medium plasticity, orange-brown (possible NATURAL - SOIL)	SM	F		-0.24
			BH47_0.35-0.45							
0.45			BH47_0.45-0.5			CL - CLAY low plasticity, pale brown- tan (possible NATURAL - SOIL)	SM	F		-0.45
0.5						Termination Depth at: 0.50 m. Target depth achieved.				-0.5

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 BH48

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 04/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284380.84
Northing 6141416.07
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
	PT					GRASS	SM	L		
0.1			BH48_0.1-0.2			SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)				-0.1
0.2										-0.2
0.3			BH48_0.3-0.4			SC - Clayey SAND low plasticity, fine to medium, poorly graded, red- brown (Reworked NATURAL)	SM	L		-0.3
0.4										-0.4
0.5						SC - Clayey SAND low plasticity, fine to medium, poorly graded, pale brown- tan (NATURAL - SOIL)	M	L		-0.5
0.6										-0.6
0.7										-0.7
0.8										-0.8
0.9			BH48_0.9-1.0							-0.9
1						CL - CLAY low to medium plasticity, grey- tan mottled pale orange (NATURAL - SOIL)	M	S		-1
1.1										-1.1
1.2										-1.2
1.3										-1.3
1.4			BH48_1.4-1.5							-1.4
1.5										-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9										-1.9
2										-2
2.1										-2.1
2.2										-2.2
2.3										-2.3
2.4			BH48_2.4-2.5							-2.4
2.5										-2.5
2.6						Termination Depth at: 2.50 m. Target depth achieved.				-2.6

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 BH49 (TW01)

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 04/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284381.14
Northing 6141394.75
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
	PT		BH49_0.01-0.1			GRASS	SM	L		
0.1						SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)				-0.1
0.2			BH49_0.15-0.25							-0.2
0.3						SC - Clayey SAND low plasticity, fine to medium, poorly graded, pale brown- tan (NATURAL - SOIL)	VM	L		-0.3
0.4										-0.4
0.5										-0.5
0.6										-0.6
0.7			BH49_0.65-0.75							-0.7
0.8										-0.8
0.9										-0.9
1				▽						-1
1.1										-1.1
1.2										-1.2
1.3										-1.3
1.4			BH49_1.4-1.5							-1.4
1.5										-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9			BH49_1.9-2.0							-1.9
2						CI - CLAY medium plasticity, grey- tan mottled brown (NATURAL - SOIL)	M	F		-2
2.1										-2.1
2.2										-2.2
2.3										-2.3
2.4			BH49_2.4-2.5							-2.4
2.5						Termination Depth at: 2.50 m. Target depth achieved.				-2.5
2.6										-2.6

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 BH50

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 04/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284379.25
Northing 6141378.43
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
	PT		BH50_0.01-0.1			GRASS	SM	L		
0.1						SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		-0.1
0.2						SC - Clayey SAND fine to medium, poorly graded, pale brown- tan (NATURAL - SOIL)				-0.2
0.3										-0.3
0.4										-0.4
0.5										-0.5
0.6										-0.6
0.7			BH50_0.65-0.75							-0.7
0.8						CI - CLAY medium plasticity, grey- tan mottled pale brown (NATURAL - SOIL)	SM	F		-0.8
0.9										-0.9
1										-1
1.1										-1.1
1.2										-1.2
1.3										-1.3
1.4			BH50_1.4-1.5							-1.4
1.5										-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9			BH50_1.9-2.0							-1.9
2										-2
2.1										-2.1
2.2										-2.2
2.3										-2.3
2.4			BH50_2.4-2.5 (QC01A,QC01B)							-2.4
2.5						Termination Depth at: 2.50 m. Target depth achieved.				-2.5
2.6										-2.6

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 BH51

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 04/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284380.93
Northing 6141366.29
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
	PT		BH51_0.01-0.1			GRASS	SM	L		
0.1						SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)				-0.1
0.2						SC - Clayey SAND low plasticity, fine to medium, poorly graded, pale brown- tan, with (NATURAL - SOIL)	SM	L		-0.2
0.3										-0.3
0.4										-0.4
0.5			BH51_0.5-0.6							-0.5
0.6						CI - CLAY medium plasticity, pale brown- tan mottled black (NATURAL - SOIL)	SM	F		-0.6
0.7										-0.7
0.8										-0.8
0.9			BH51_0.9-1.0							-0.9
1										-1
1.1										-1.1
1.2										-1.2
1.3										-1.3
1.4			BH51_1.4-1.5							-1.4
1.5										-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9										-1.9
2										-2
2.1										-2.1
2.2										-2.2
2.3										-2.3
2.4			BH51_2.4-2.5							-2.4
2.5										-2.5
2.6						Termination Depth at: 2.50 m. Target depth achieved.				-2.6

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 BH52

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 04/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284384.37
Northing 6141346.74
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
	PT		BH52_0.01-0.15			GRASS	SM	L		
0.1						SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)				-0.1
0.2						SC - Clayey SAND low plasticity, fine to medium, poorly graded, pale orange- brown (Reworked NATURAL)	SM	L		-0.2
0.3			BH52_0.3-0.4							-0.3
0.4						SC - Clayey SAND no plasticity, fine to medium, poorly graded, pale brown- tan (NATURAL - SOIL)	D	L		-0.4
0.5										-0.5
0.6										-0.6
0.7										-0.7
0.8										-0.8
0.9			BH52_0.9-1.0							-0.9
1						CI - CLAY low to medium plasticity, tan- brown mottled dark brown (NATURAL - SOIL)	SM	F		-1
1.1										-1.1
1.2										-1.2
1.3										-1.3
1.4			BH52_1.4-1.5							-1.4
1.5										-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9			BH52_1.9-2.0							-1.9
2										-2
2.1										-2.1
2.2										-2.2
2.3										-2.3
2.4			BH52_2.4-2.5							-2.4
2.5										-2.5
2.6						Termination Depth at: 2.50 m. Target depth achieved.				-2.6

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 BH53

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 04/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284383.9
Northing 6141337.21
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
0	PT		BH53_0.01-0.15			GRASS	SM	L		0
0.1						SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)				-0.1
0.2						SC - Clayey SAND low plasticity, fine to medium, poorly graded, orange- brown (Reworked NATURAL)	SM	L		-0.2
0.3			BH53_0.25-0.35							-0.3
0.4						SC - Clayey SAND no plasticity, fine to medium, poorly graded, tan- brown (NATURAL - SOIL)	D	L		-0.4
0.5										-0.5
0.6										-0.6
0.7										-0.7
0.8										-0.8
0.9										-0.9
1										-1
1.1			BH53_1.1-1.2							-1.1
1.2						CL - CLAY low plasticity, tan- brown mottled dark brown (NATURAL - SOIL)	SM	F		-1.2
1.3										-1.3
1.4										-1.4
1.5										-1.5
1.6			BH53_1.6-1.7							-1.6
1.7										-1.7
1.8										-1.8
1.9										-1.9
2										-2
2.1			BH53_2.1-2.2							-2.1
2.2										-2.2
2.3										-2.3
2.4			BH53_2.4-2.5							-2.4
2.5										-2.5
2.6						Termination Depth at: 2.50 m. Target depth achieved.				-2.6

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

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 04/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284384.77
Northing 6141325.32
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
0	PT		BH54_0.0-0.15			SM - Silty SAND fine to medium, poorly graded, dark brown, trace fine gravel (Reworked NATURAL)	SM	L		0
0.1										-0.1
0.2						SC - Clayey SAND low plasticity, fine to medium, poorly graded, pale orange- brown (Reworked NATURAL)	SM	L		-0.2
0.3			BH54_0.3-0.4							-0.3
0.4						SC - Clayey SAND no plasticity, fine to medium, poorly graded, pale brown- tan (NATURAL - SOIL)	D	L		-0.4
0.5										-0.5
0.6										-0.6
0.7										-0.7
0.8										-0.8
0.9			BH54_0.9-1.0							-0.9
1										-1
1.1										-1.1
1.2										-1.2
1.3										-1.3
1.4			BH54_1.4-1.5							-1.4
1.5										-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9			BH54_1.9-2.0							-1.9
2						CI - CLAY low to medium plasticity, tan- brown mottled pale orange (NATURAL - SOIL)	SM	F		-2
2.1										-2.1
2.2										-2.2
2.3										-2.3
2.4			BH54_2.4-2.5 (QC02A,QC02B)							-2.4
2.5						Termination Depth at: 2.50 m. Target depth achieved.				-2.5
2.6										-2.6

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 BH55

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 04/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284366.5
Northing 6141394.16
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
	PT		BH55_0.01-0.1			GRASS	SM	L		
0.1						SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)				-0.1
0.2			BH55_0.15-0.25							-0.2
0.3						SC - Clayey SAND low plasticity, fine to medium, poorly graded, tan- brown (possible NATURAL - SOIL)	SM	L		-0.3
0.4										-0.4
0.5										-0.5
0.6										-0.6
0.7										-0.7
0.8			BH55_0.75-0.85							-0.8
0.9						SC - Sandy CLAY low to medium plasticity, pale brown- tan, fine to medium, poorly graded sand (NATURAL - SOIL)	VM	VS		-0.9
1										-1
1.1										-1.1
1.2										-1.2
1.3										-1.3
1.4			BH55_1.4-1.5							-1.4
1.5						CI - CLAY medium plasticity, pale brown- tan (NATURAL - SOIL)	M	F		-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9			BH55_1.9-2.0							-1.9
2										-2
2.1										-2.1
2.2										-2.2
2.3										-2.3
2.4			BH55_2.4-2.5							-2.4
2.5										-2.5
2.6						Termination Depth at: 2.50 m. Target depth achieved.				-2.6

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 BH56

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 04/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284374.24
Northing 6141394.57
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
	PT		BH56_0.01-0.2			GRASS	SM	L		
0.1						SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)				-0.1
0.2			BH56_0.2-0.3			SC - Clayey SAND low plasticity, microcrystalline, poorly graded, orange- brown (Reworked NATURAL)	SM	L		-0.2
0.3						SC - Sandy CLAY low to medium plasticity, pale brown- tan, fine to medium, poorly graded sand (NATURAL - SOIL)	M	S		-0.3
0.4			BH56_0.4-0.5							-0.4
0.5										-0.5
0.6										-0.6
0.7										-0.7
0.8										-0.8
0.9			BH56_0.9-1.0							-0.9
1										-1
1.1										-1.1
1.2										-1.2
1.3										-1.3
1.4			BH56_1.4-1.5							-1.4
1.5										-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9			BH56_1.9-2.0							-1.9
2						CI - CLAY medium plasticity, grey- tan mottled black (NATURAL - SOIL)	SM	F		-2
2.1										-2.1
2.2										-2.2
2.3										-2.3
2.4			BH56_2.4-2.5							-2.4
2.5						Termination Depth at: 2.50 m. Target depth achieved.				-2.5
2.6										-2.6

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 BH57

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 05/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 5.00
Diameter (mm) 50

Easting 284406.18
Northing 6141354.75
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
0	HA		BH57_0.0-0.1			SM - Silty SAND fine to medium, poorly graded, dark brown, some rootlets (Reworked NATURAL)	SM	L		0
0.2						SC - Clayey SAND fine to medium, poorly graded, brown, trace rootlets (Reworked NATURAL)	SM	L		-0.2
0.4			BH57_0.4-0.5							-0.4
0.6						SC - Clayey SAND fine to medium, poorly graded, orange- brown, fine to medium sand (NATURAL - SOIL)	SM	L		-0.6
0.8			BH57_0.7-0.8							-0.8
1	PT					SC - Sandy CLAY low plasticity, pale brown- tan, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-1
1.2										-1.2
1.4			BH57_1.4-1.5							-1.4
1.6										-1.6
1.8										-1.8
2			BH57_1.9-2.0			CI - CLAY low to medium plasticity, grey- brown mottled black (NATURAL - SOIL)	SM	ST		-2
2.2										-2.2
2.4										-2.4
2.6										-2.6
2.8										-2.8
3			BH57_2.9-3.0			CI - CLAY medium plasticity, grey- brown mottled red (NATURAL - SOIL)	SM	ST		-3
3.2										-3.2
3.4										-3.4
3.6										-3.6
3.8										-3.8
4			BH57_3.9-4.0							-4
4.2										-4.2
4.4										-4.4
4.6										-4.6
4.8										-4.8
5			BH57_4.9-5.0							-5
5.2						Termination Depth at: 5.00 m. Target depth achieved.				-5.2

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-GROUNDWATER

MONITORING WELL MW03 (BH58)

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 05/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Drill Method
Total Depth (m) 4.00
Casing Diameter (mm) 100

Easting, Northing 284403.6, 6141394.73
Grid Ref GDA94_MGA_zone_54
Elevation
TOC mAHD -
Logged By Terrence Wilson
Checked By Tom Duncan

B.C.L No. 441675 **Casing** 50 mm PVC (Class 18) **Screen** 0.5mm Slotted PVC (Class 18) **Surface Completion** Backfill

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		BH58_0.0-0.1		MW03 Concrete		SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)	SM	L		0
0.2					Bentonite						-0.2
0.4			BH58_0.3-0.4				SC - Clayey SAND low plasticity, fine to medium, poorly graded, brown with tan (Reworked NATURAL)	SM	L		-0.4
0.6			BH58_0.5-0.6				SC - Clayey SAND low plasticity, fine to medium, poorly graded, pale red- brown (NATURAL - SOIL)	SM	L		-0.6
0.8	PT		BH58_0.75-0.85				SC - Sandy CLAY low to medium plasticity, pale brown- tan, fine to medium, poorly graded sand (NATURAL - SOIL)	W	VS		-0.8
1				▽							-1
1.2											-1.2
1.4											-1.4
1.6			BH58_1.5-1.6				CI - CLAY low to medium plasticity, pale brown- tan (NATURAL - SOIL)	VM	S		-1.6
1.8											-1.8
2											-2
2.2			BH58_2.1-2.3		Gravel						-2.2
2.4							CH - CLAY medium to high plasticity, grey-brown mottled red (NATURAL - SOIL)	M	F		-2.4
2.6											-2.6
2.8											-2.8
3			BH58_2.9-3.0								-3
3.2											-3.2
3.4											-3.4
3.6											-3.6
3.8											-3.8
4			BH58_3.9-4.0 (QC03A,QC03B)								-4
4.2							Termination Depth at: 4.00 m. Target depth achieved.				-4.2
4.4											-4.4
4.6											-4.6
4.8											-4.8

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-SOIL BORE

SOIL BORE BH59

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 05/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284472.72
Northing 6141358.66
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
	PT		BH59_0.0-0.06			GRASS	D	L		
0.1						SM - Silty SAND medium, poorly graded, dark brown, some roots (Reworked NATURAL)	D	L		-0.1
0.2						SC - Clayey SAND no plasticity, fine to medium, uniform, dark brown- red, trace rootlets (Reworked NATURAL)				-0.2
0.3			BH59_0.3-0.4							-0.3
0.4						SM - Silty SAND poorly graded, pale brown- tan (possible NATURAL - SOIL)	D	L		-0.4
0.5										-0.5
0.6			BH59_0.6-0.7							-0.6
0.7						SM - Silty SAND medium, poorly graded, pale brown-white (possible NATURAL - SOIL)	D	L		-0.7
0.8										-0.8
0.9										-0.9
1			BH59_0.95-1.05							-1
1.1						SC - Clayey SAND medium, poorly graded, pale white- (NATURAL - SOIL)	D	D	Calcrete	-1.1
1.2										-1.2
1.3			BH59_1.3-1.4							-1.3
1.4						CI - CLAY medium plasticity, pale olive- grey	D	VD	Tree roots ranging up to 5mm	-1.4
1.5										-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9			BH59_1.9-2.0							-1.9
2										-2
2.1										-2.1
2.2										-2.2
2.3										-2.3
2.4			BH59_2.4-2.5							-2.4
2.5						Termination Depth at: 2.50 m. Target depth achieved.				-2.5
2.6										-2.6

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 BH60

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 05/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284470.16
Northing 6141374.69
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
	PT		BH60_0.01-0.15			GRASS	SM	L		
0.1						SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)				-0.1
0.2						SC - Clayey SAND low plasticity, fine to medium, poorly graded, pale red- brown (Reworked NATURAL)	SM	L		-0.2
0.3										-0.3
0.4			BH60_0.4-0.5							-0.4
0.5						SC - Clayey SAND no plasticity, fine to medium, poorly graded, pale tan- brown (NATURAL - SOIL)	D	L		-0.5
0.6										-0.6
0.7										-0.7
0.8										-0.8
0.9			BH60_0.9-1.0							-0.9
1										-1
1.1										-1.1
1.2										-1.2
1.3			BH60_1.3-1.4							-1.3
1.4						SP - SAND fine to medium, poorly graded, grey- white (NATURAL - SOIL)	D	L	Calcrete	-1.4
1.5										-1.5
1.6			BH60_1.6-1.7							-1.6
1.7						Cl - CLAY low to medium plasticity, olive- brown (NATURAL - SOIL)	SM	ST		-1.7
1.8										-1.8
1.9										-1.9
2										-2
2.1										-2.1
2.2										-2.2
2.3										-2.3
2.4			BH60_2.4-2.5							-2.4
2.5										-2.5
2.6						Termination Depth at: 2.50 m. Target depth achieved.				-2.6

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 BH61

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 05/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284467.85
Northing 6141384.55
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
0	Soil Boreh		BH61_0.01-0.05			GRASS	D	VL		0
0.1			BH61_0.05-0.15			SM - Silty SAND medium to coarse, poorly graded, dark brown, with mulch (Reworked NATURAL)	D	L		-0.1
0.2						SM - Silty SAND medium to coarse, poorly graded, dark brown, some rootlets (Reworked NATURAL)	D	MD		-0.2
0.3						SM - Silty SAND low plasticity, dark brown- red (Reworked NATURAL)				-0.3
0.4										-0.4
0.5			BH61_0.5-0.6							-0.5
0.6						SM - Silty SAND low plasticity, pale tan- white (NATURAL - SOIL)	D	MD	Calcrete	-0.6
0.7										-0.7
0.8										-0.8
0.9										-0.9
1										-1
1.1										-1.1
1.2			BH61_1.15-1.25							-1.2
1.3						CI - CLAY medium plasticity, dark grey- olive (NATURAL - SOIL)	D	VD	Mottled	-1.3
1.4										-1.4
1.5										-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9			BH61_1.9-2.0							-1.9
2										-2
2.1										-2.1
2.2										-2.2
2.3										-2.3
2.4			BH61_2.4-2.5							-2.4
2.5										-2.5
2.6						Termination Depth at: 2.50 m. Soil Borehole.				-2.6

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 BH62

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 05/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284466.2
Northing 6141405.1
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
	PT		BH62_0.01-0.1			GRASS	SM	L		
0.1						SM - Silty SAND fine to medium, poorly graded, brown, trace rootlets (Reworked NATURAL)				-0.1
0.2			BH62_0.2-0.3							-0.2
0.3						SC - Clayey SAND no plasticity, fine to medium, poorly graded, tan- brown (possible NATURAL - SOIL)	D	L		-0.3
0.4										-0.4
0.5										-0.5
0.6										-0.6
0.7										-0.7
0.8			BH62_0.8-0.9							-0.8
0.9						SC - Sandy CLAY low plasticity, brown, fine to medium, poorly graded sand (NATURAL - SOIL)	SM	F		-0.9
1										-1
1.1										-1.1
1.2										-1.2
1.3										-1.3
1.4			BH62_1.4-1.5							-1.4
1.5						CI - CLAY low to medium plasticity, grey- brown mottled orange (NATURAL - SOIL)	SM	ST		-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9			BH62_1.9-2.0							-1.9
2										-2
2.1										-2.1
2.2										-2.2
2.3										-2.3
2.4			BH62_2.4-2.5 (QC04A,QC04B)							-2.4
2.5						Termination Depth at: 2.50 m. Target depth achieved.				-2.5
2.6										-2.6

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 BH63

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 05/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284460.33
Northing 6141340.07
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
0			BH63-0.01-0.11			GRASS	D	L		0
0.1			BH63_0.1_0.2			SM - Silty SAND fine to medium, poorly graded, rounded, dark brown, trace rootlets (Reworked NATURAL)				-0.1
0.2						SC - Clayey SAND fine to medium, poorly graded, rounded, dark orange- brown (Reworked NATURAL)	SM	L		-0.2
0.3										-0.3
0.4			BH63_0.4-0.53							-0.4
0.5						SC - Clayey SAND fine to medium, poorly graded, subrounded to rounded, pale tan (Reworked NATURAL)	D	VL		-0.5
0.6										-0.6
0.7										-0.7
0.8										-0.8
0.9			BH63_0.9-1.0							-0.9
1						SC - Clayey SAND fine to medium, poorly graded, rounded, tan (Reworked NATURAL)	D	L		-1
1.1										-1.1
1.2			BH63_1.15-1.25							-1.2
1.3						SC - Sandy CLAY low to medium plasticity, fine to medium, poorly graded, rounded, brown- grey, rounded, fine to medium, poorly graded sand (Reworked NATURAL)	D	MD		-1.3
1.4			BH63_1.4-1.5							-1.4
1.5										-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9										-1.9
2										-2
2.1										-2.1
2.2						CI - CLAY low to medium plasticity, fine, uniform, rounded, green- grey (Reworked NATURAL)	D	ST		-2.2
2.3										-2.3
2.4			BH63_2.4-2.5							-2.4
2.5	PT					Termination Depth at: 2.50 m. Target depth achieved.				-2.5
2.6										-2.6

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 BH64

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 05/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284432.04
Northing 6141347.08
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
	HA		BH64_0.01-0.1			GRASS	SM	L		
0.1						SM - Silty SAND fine to medium, poorly graded, dark brown, trace rootlets (Reworked NATURAL)				-0.1
0.2			BH64_0.15-0.25							-0.2
0.3						SC - Clayey SAND low plasticity, fine to medium, poorly graded, red- brown (Reworked NATURAL)	SM	MD		-0.3
0.4										-0.4
0.5										-0.5
0.6										-0.6
0.7										-0.7
0.8			BH64_0.75-0.85							-0.8
0.9						CI - CLAY low to medium plasticity, tan- brown (NATURAL - SOIL)	SM	ST		-0.9
1										-1
1.1										-1.1
1.2										-1.2
1.3										-1.3
1.4			BH64_1.4-1.5							-1.4
1.5										-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9			BH64_1.9-2.0							-1.9
2										-2
2.1										-2.1
2.2										-2.2
2.3										-2.3
2.4			BH64_2.4-2.5							-2.4
2.5						Termination Depth at: 2.50 m. Target depth achieved.				-2.5
2.6										-2.6

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 BH65

Client SA MFS
Project MFS Oakden DSI
Project No. 12611126
Site MFS Oakden
Location 700 Grand Junction Road
Date Drilled 05/09/2023

Drill Co. WB Drilling
Driller David Watt
Rig Type Eziprobe
Total Depth (m) 2.50
Diameter (mm) 50

Easting 284418.73
Northing 6141346.42
Grid Ref GDA94_MGA_zone_54
Elevation
Logged By Terrence Wilson
Checked By Tom Duncan

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.	Elevation (m)
	PT		BH65_0.01-0.1			GRASS	SM	L		
0.1						SC - Clayey SAND low plasticity, fine to medium, poorly graded, red- brown, trace rootlets (Reworked NATURAL)				-0.1
0.2										-0.2
0.3			BH65_0.3-0.4							-0.3
0.4						SC - Clayey SAND low to medium plasticity, fine to medium, poorly graded, dark brown (possible NATURAL - SOIL)	SM	MD		-0.4
0.5										-0.5
0.6										-0.6
0.7										-0.7
0.8										-0.8
0.9			BH65_0.9-1.0							-0.9
1										-1
1.1										-1.1
1.2										-1.2
1.3										-1.3
1.4			BH65_1.4-1.5							-1.4
1.5						CH - CLAY medium to high plasticity, tan- brown with grey (NATURAL - SOIL)	SM	ST		-1.5
1.6										-1.6
1.7										-1.7
1.8										-1.8
1.9			BH65_1.9-2.0							-1.9
2										-2
2.1										-2.1
2.2										-2.2
2.3										-2.3
2.4			BH65_2.4-2.5 (QC05A,QC05B)							-2.4
2.5						Termination Depth at: 2.50 m. Target depth achieved.				-2.5
2.6										-2.6

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

Appendix E

SSHILs 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

Davide Menozzi
Senior Environmental Scientist
davide.menozzi@ghd.com

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

eurofins

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

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

Melbourne
6 Monterey Road
Dandenong South
VIC 3175
Tel: +61 3 8564 5000
NATA# 1261 Site# 1254

Geelong
19/8 Lewalan Street
Grovedale
VIC 3216
Tel: +61 3 8564 5000
NATA# 1261 Site# 25403

Sydney
179 Magowar Road
Girraween
NSW 2145
Tel: +61 2 9900 8400
NATA# 1261 Site# 18217

Canberra
Unit 1,2 Dacre Street
Mitchell
ACT 2911
Tel: +61 2 6113 8091
NATA# 1261 Site# 25466

Brisbane
1/21 Smallwood Place
Murarrie
QLD 4172
Tel: +61 7 3902 4600
NATA# 1261 Site# 20794

Newcastle
1/2 Frost Drive
Mayfield West NSW 2304
Tel: +61 2 4968 8448
NATA# 1261
Site# 25079 & 25289

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
35 O'Rorke Road
Penrose,
Auckland 1061
Tel: +64 9 526 4551
IANZ# 1327

Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: +64 3 343 5201
IANZ# 1290

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

Project Name: MFS OAKDEN DSI
Project ID: 12611126

Order No.:
Report #: 1013592
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Aug 3, 2023 3:55 PM
Due: Aug 8, 2023
Priority: 3 Day
Contact Name: Terrance Wilson

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Eurofins Suite B11F: Cl/SO4/Alkalinity/Total F	Per- and Polyfluoroalkyl Substances (PFASs)	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X
External Laboratory										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	MW01	Aug 03, 2023		Water	M23-Au0008347		X	X	X	X
2	MW02	Aug 03, 2023		Water	M23-Au0008348		X	X	X	X
3	QC01A	Aug 03, 2023		Water	M23-Au0008349			X		
4	TB01	Aug 03, 2023		Water	M23-Au0008350			X		
5	FB01	Aug 03, 2023		Water	M23-Au0008351			X		
6	RB04	Aug 03, 2023		Water	M23-Au0008352			X		
7	UST_NORTH PORT	Aug 03, 2023		Water	M23-Au0008353	X				
Test Counts						1	2	6	2	2

eurofins | Environment Testing

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

Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

Melbourne
6 Monterey Road
Dandenong South
VIC 3175
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NATA# 1261 Site# 20794

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Mayfield West NSW 2304
Tel: +61 2 4968 8448
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46-48 Banksia Road
Welshpool
WA 6106
Tel: +61 8 6253 4444
NATA# 2377 Site# 2370

Eurofins Environment Testing NZ Ltd

NZBN: 9429046024954

Auckland
35 O'Rorke Road
Penrose,
Auckland 1061
Tel: +64 9 526 4551
IANZ# 1327

Christchurch
43 Detroit Drive
Rolleston,
Christchurch 7675
Tel: +64 3 343 5201
IANZ# 1290

Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Terrance Wilson
Project name:	MFS OAKDEN DSI
Project ID:	12611126
Turnaround time:	3 Day
Date/Time received	Aug 3, 2023 3:55 PM
Eurofins reference	1013592

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 Terrance Wilson - Terrence.Wilson@ghd.com.

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

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: **Terrance Wilson**

Report **1013592-W**
Project name MFS OAKDEN DSI
Project ID 12611126
Received Date Aug 03, 2023

Client Sample ID			**MW01**	**MW02**	**QC01A**	**TB01**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**M23-Au0008347**	**M23-Au0008348**	**M23-Au0008349**	**M23-Au0008350**
Date Sampled			**Aug 03, 2023**	**Aug 03, 2023**	**Aug 03, 2023**	**Aug 03, 2023**
Test/Reference	LOR	Unit				
Chloride	1	mg/L	870	2200	-	-
Fluoride	0.5	mg/L	< 0.5	< 0.5	-	-
Sulphate (as SO4)	5	mg/L	140	560	-	-
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	2300	3800	-	-
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	880	1100	-	-
Carbonate Alkalinity (as CaCO3)	10	mg/L	< 10	< 10	-	-
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	-	-
Total Alkalinity (as CaCO3)	20	mg/L	880	1100	-	-
Alkali Metals						
Calcium	0.5	mg/L	20	58	-	-
Magnesium	0.5	mg/L	48	170	-	-
Potassium	0.5	mg/L	19	23	-	-
Sodium	0.5	mg/L	890	1900	-	-
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	0.35	4.3	5.1	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	[N09]1.1	10	[N09]10	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	[N09]0.78	38	[N09]39	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	0.55	3.8	4.6	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	0.12	8.7	11	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	0.02	< 0.01	[G01]< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	[G01]< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	[G01]< 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	%	78	105	81	83
13C5-PFPeA (surr.)	1	%	63	122	119	94
13C5-PFHxA (surr.)	1	%	79	105	99	96
13C4-PFHpA (surr.)	1	%	96	123	98	74
13C8-PFOA (surr.)	1	%	100	92	57	92
13C5-PFNA (surr.)	1	%	109	99	88	103
13C6-PFDA (surr.)	1	%	91	64	97	102
13C2-PFUnDA (surr.)	1	%	83	39	75	85
13C2-PFDoDA (surr.)	1	%	78	70	70	91
13C2-PFTeDA (surr.)	1	%	14	39	22	45

Client Sample ID			MW01	MW02	QC01A	TB01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M23-Au0008347	M23-Au0008348	M23-Au0008349	M23-Au0008350
Date Sampled			Aug 03, 2023	Aug 03, 2023	Aug 03, 2023	Aug 03, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	[G01]< 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	[G01]< 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	%	90	99	139	145
D3-N-MeFOSA (surr.)	1	%	149	33	102	35
D5-N-EtFOSA (surr.)	1	%	166	28	108	28
D7-N-MeFOSE (surr.)	1	%	64	73	102	132
D9-N-EtFOSE (surr.)	1	%	86	71	90	124
D5-N-EtFOSAA (surr.)	1	%	71	86	92	136
D3-N-MeFOSAA (surr.)	1	%	70	87	89	139
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.05	26	26	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01	0.15	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	11	[G01]12	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	0.02	30	30	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	0.08	170	[N09]160	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	8.6	8.7	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	0.19	30	[N09]35	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	0.03	< 0.01
13C3-PFBS (surr.)	1	%	92	111	107	101
18O2-PFHxS (surr.)	1	%	111	75	72	93
13C8-PFOS (surr.)	1	%	94	77	98	101
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	0.10	0.82	0.88	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	[G01]< 0.01	< 0.01
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	0.01	ug/L	< 0.01	< 0.01	[G01]< 0.01	< 0.01
13C2-4:2 FTSA (surr.)	1	%	118	53	100	89
13C2-6:2 FTSA (surr.)	1	%	56	92	85	133
13C2-8:2 FTSA (surr.)	1	%	112	51	129	103
13C2-10:2 FTSA (surr.)	1	%	79	123	105	157
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.27	200	195	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.31	38.7	46	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.39	208.7	206	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	3.32	291.62	291.58	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	3.36	341.22	342.46	< 0.1

Client Sample ID			FB01	RB04
Sample Matrix			Water	Water
Eurofins Sample No.			M23-Au0008351	M23-Au0008352
Date Sampled			Aug 03, 2023	Aug 03, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	< 0.01	< 0.01
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	%	81	75
13C5-PFPeA (surr.)	1	%	101	104
13C5-PFHxA (surr.)	1	%	103	108
13C4-PFHpA (surr.)	1	%	100	107
13C8-PFOA (surr.)	1	%	88	89
13C5-PFNA (surr.)	1	%	95	101
13C6-PFDA (surr.)	1	%	90	96
13C2-PFUnDA (surr.)	1	%	73	80
13C2-PFDoDA (surr.)	1	%	59	65
13C2-PFTeDA (surr.)	1	%	52	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	%	90	88
D3-N-MeFOSA (surr.)	1	%	68	15
D5-N-EtFOSA (surr.)	1	%	62	14
D7-N-MeFOSE (surr.)	1	%	77	53
D9-N-EtFOSE (surr.)	1	%	80	53
D5-N-EtFOSAA (surr.)	1	%	77	82
D3-N-MeFOSAA (surr.)	1	%	75	92
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01

Client Sample ID			FB01	RB04
Sample Matrix			Water	Water
Eurofins Sample No.			M23-Au0008351	M23-Au0008352
Date Sampled			Aug 03, 2023	Aug 03, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl sulfonic acids (PFSAs)				
13C3-PFBS (surr.)	1	%	90	94
18O2-PFHxS (surr.)	1	%	89	92
13C8-PFOS (surr.)	1	%	83	91
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	%	111	129
13C2-6:2 FTSA (surr.)	1	%	98	125
13C2-8:2 FTSA (surr.)	1	%	78	103
13C2-10:2 FTSA (surr.)	1	%	65	86
PFASs Summations				
Sum (PFHxS + PFOS)*	0.01	ug/L	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	< 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
Eurofins Suite B11F: Cl/SO4/Alkalinity/Total F			
Chloride	Melbourne	Aug 07, 2023	28 Days
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Fluoride	Melbourne	Aug 08, 2023	28 Days
- Method: Ion selective electrode (ISE) by APHA 4500-F B, C and in-house method LTM-INO-4150			
Sulphate (as SO4)	Melbourne	Aug 07, 2023	28 Days
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Alkalinity (speciated)	Melbourne	Aug 07, 2023	14 Days
- Method: LTM-INO-4250 Alkalinity by Electrometric Titration			
Total Dissolved Solids Dried at 180 °C ± 2 °C	Melbourne	Aug 07, 2023	28 Days
- Method: LTM-INO-4170 Total Dissolved Solids in Water			
Eurofins Suite B11C: Na/K/Ca/Mg	Melbourne	Aug 07, 2023	180 Days
- Method: LTM-MET-3010 Alkali Metals by ICP-AES			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Aug 04, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Aug 04, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Aug 04, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Aug 04, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Aug 03, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Aug 3, 2023 3:55 PM
Due: Aug 8, 2023
Priority: 3 Day
Contact Name: Terrance Wilson

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Eurofins Suite B11F: Cl/SO4/Alkalinity/Total F	Per- and Polyfluoroalkyl Substances (PFASs)	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X	X
External Laboratory										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	MW01	Aug 03, 2023		Water	M23-Au0008347		X	X	X	X
2	MW02	Aug 03, 2023		Water	M23-Au0008348		X	X	X	X
3	QC01A	Aug 03, 2023		Water	M23-Au0008349			X		
4	TB01	Aug 03, 2023		Water	M23-Au0008350			X		
5	FB01	Aug 03, 2023		Water	M23-Au0008351			X		
6	RB04	Aug 03, 2023		Water	M23-Au0008352			X		
7	UST_NORTH PORT	Aug 03, 2023		Water	M23-Au0008353	X				
Test Counts						1	2	6	2	2

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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							
Chloride	mg/L	< 1			1	Pass	
Fluoride	mg/L	< 0.5			0.5	Pass	
Sulphate (as SO4)	mg/L	< 5			5	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	mg/L	< 10			10	Pass	
Method Blank							
Alkalinity (speciated)							
Bicarbonate Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Carbonate Alkalinity (as CaCO3)	mg/L	< 10			10	Pass	
Hydroxide Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Total Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Method Blank							
Alkali Metals							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
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)							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
Chloride	%	120			70-130	Pass	
Fluoride	%	108			70-130	Pass	
Sulphate (as SO4)	%	123			70-130	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	%	107			70-130	Pass	
LCS - % Recovery							
Alkalinity (speciated)							
Total Alkalinity (as CaCO3)	%	91			70-130	Pass	
LCS - % Recovery							
Alkali Metals							
Calcium	%	92			80-120	Pass	
Magnesium	%	105			80-120	Pass	
Potassium	%	107			80-120	Pass	
Sodium	%	109			80-120	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	86			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	75			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	80			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	71			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	72			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	75			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	73			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	86			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	82			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	52			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	110			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	73			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	85			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	77			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	72			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	84			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	73			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	83			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	83			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	81			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	93			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	73			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	75			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	84			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	78			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)	%	87			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	90			50-150	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)			%	91			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)			%	89			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
				Result 1					
Chloride	M23-Au0007697	NCP	%	101			70-130	Pass	
Spike - % Recovery									
Alkali Metals				Result 1					
Calcium	M23-Au0009606	NCP	%	97			75-125	Pass	
Magnesium	M23-Au0009606	NCP	%	101			75-125	Pass	
Potassium	M23-Au0009606	NCP	%	100			75-125	Pass	
Sodium	M23-Au0009606	NCP	%	100			75-125	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorooctanoic acid (PFOA)	M23-Au0008517	NCP	%	57			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0008517	NCP	%	59			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Au0008517	NCP	%	69			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0008517	NCP	%	78			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Total Dissolved Solids Dried at 180 °C ± 2 °C	M23-Au0007776	NCP	mg/L	3600	3800	7.0	30%	Pass	
Duplicate									
Alkali Metals				Result 1	Result 2	RPD			
Calcium	M23-Au0009606	NCP	mg/L	28	29	<1	30%	Pass	
Magnesium	M23-Au0009606	NCP	mg/L	27	27	<1	30%	Pass	
Potassium	M23-Au0009606	NCP	mg/L	25	25	<1	30%	Pass	
Sodium	M23-Au0009606	NCP	mg/L	280	290	1.3	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Au0013582	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Au0013582	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Au0013582	NCP	ug/L	0.03	0.03	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Au0013582	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Au0013582	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Au0013582	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Au0013582	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Au0013582	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Au0013582	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Au0013582	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0009162	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Au0013582	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0013582	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0013582	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Au0013582	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0013582	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Au0013582	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0013582	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Au0013582	NCP	ug/L	0.03	0.03	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Au0013582	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0009162	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Au0013582	NCP	ug/L	0.02	0.02	1.8	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0013582	NCP	ug/L	0.11	0.10	4.5	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0013582	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Au0013582	NCP	ug/L	0.04	0.04	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Au0013582	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-Au0013582	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0013582	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0013582	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0013582	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Chloride	M23-Au0008348	CP	mg/L	2200	2200	<1	30%	Pass	
Sulphate (as SO4)	M23-Au0008348	CP	mg/L	560	560	<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
G01	The LORs have been raised due to matrix interference
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).
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised by:

Catherine Wilson	Analytical Services Manager
Caitlin Breeze	Senior Analyst-Inorganic
Caitlin Breeze	Senior Analyst-Metal
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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Eurofins Environment Testing Australia Pty Ltd
ABN: 50 005 085 521

Melbourne	Geelong	Sydney	Canberra	Brisbane	Newcastle
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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
Adelaide
SA 5001

Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1026487
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 15, 2023 3:42 PM
Due: Sep 22, 2023
Priority: 5 Day
Contact Name: Terrance Wilson

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Eurofins Suite B11F: Cl/SO4/Alkalinity/Total F	Per- and Polyfluoroalkyl Substances (PFASs)	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	MW01	Sep 14, 2023		Water	M23-Se0035567	X	X	X	X
2	MW02	Sep 14, 2023		Water	M23-Se0035568	X	X	X	X
3	MW03	Sep 14, 2023		Water	M23-Se0035569	X	X	X	X
4	TW01	Sep 14, 2023		Water	M23-Se0035570	X	X	X	X
5	FD01	Sep 14, 2023		Water	M23-Se0035571		X		
6	FB01	Sep 14, 2023		Water	M23-Se0035572		X		
7	RB01	Sep 14, 2023		Water	M23-Se0035573		X		
Test Counts						4	7	4	4

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Eurofins Environment Testing Australia Pty Ltd

ABN: 50 005 085 521

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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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Penrose,	Rolleston,	Gate Pa,
Auckland 1061	Christchurch 7675	Tauranga 3112
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IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Terrance Wilson
Project name:	MFS Oakden DSI
Project ID:	12611126
Turnaround time:	5 Day
Date/Time received	Sep 15, 2023 3:42 PM
Eurofins reference	1026487

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 Terrance Wilson - Terrence.Wilson@ghd.com.

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

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: **Terrance Wilson**

Report **1026487-W**
Project name MFS Oakden DSI
Project ID 12611126
Received Date Sep 15, 2023

Client Sample ID			**MW01**	**MW02**	**MW03**	**TW01**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins Sample No.			**M23-Se0035567**	**M23-Se0035568**	**M23-Se0035569**	**M23-Se0035570**
Date Sampled			**Sep 14, 2023**	**Sep 14, 2023**	**Sep 14, 2023**	**Sep 14, 2023**
Test/Reference	LOR	Unit				
Chloride	1	mg/L	3200	1800	420	720
Fluoride	0.5	mg/L	< 0.5	< 0.5	< 0.5	1.0
Sulphate (as SO4)	5	mg/L	390	650	120	190
Total Dissolved Solids Dried at 180 °C ± 2 °C	10	mg/L	5400	4100	930	2200
Alkalinity (speciated)						
Bicarbonate Alkalinity (as CaCO3)	20	mg/L	970	1400	190	1000
Carbonate Alkalinity (as CaCO3)	10	mg/L	81	96	21	170
Hydroxide Alkalinity (as CaCO3)	20	mg/L	< 20	< 20	< 20	< 20
Total Alkalinity (as CaCO3)	20	mg/L	1000	1500	210	1200
Alkali Metals						
Calcium	0.5	mg/L	34	48	28	< 5
Magnesium	0.5	mg/L	130	150	32	13
Potassium	0.5	mg/L	33	22	6.9	12
Sodium	0.5	mg/L	2400	1800	310	1100
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	0.15	2.2	< 0.05	0.06
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	0.73	4.6	< 0.01	0.07
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	0.37	21	0.01	0.28
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	0.12	1.9	< 0.01	[N09]0.04
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	0.02	5.5	< 0.01	[N09]0.07
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	%	88	108	51	31
13C5-PFPeA (surr.)	1	%	104	120	94	84
13C5-PFHxA (surr.)	1	%	107	116	99	83
13C4-PFHpA (surr.)	1	%	106	115	94	84
13C8-PFOA (surr.)	1	%	104	108	104	88
13C5-PFNA (surr.)	1	%	70	59	84	76
13C6-PFDA (surr.)	1	%	63	42	76	67
13C2-PFUnDA (surr.)	1	%	54	66	73	72
13C2-PFDoDA (surr.)	1	%	52	64	71	67
13C2-PFTeDA (surr.)	1	%	58	71	48	66

Client Sample ID			MW01	MW02	MW03	TW01
Sample Matrix			Water	Water	Water	Water
Eurofins Sample No.			M23-Se0035567	M23-Se0035568	M23-Se0035569	M23-Se0035570
Date Sampled			Sep 14, 2023	Sep 14, 2023	Sep 14, 2023	Sep 14, 2023
Test/Reference	LOR	Unit				
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	%	77	88	100	85
D3-N-MeFOSA (surr.)	1	%	95	111	128	121
D5-N-EtFOSA (surr.)	1	%	83	96	106	107
D7-N-MeFOSE (surr.)	1	%	47	68	61	39
D9-N-EtFOSE (surr.)	1	%	51	64	70	61
D5-N-EtFOSAA (surr.)	1	%	39	53	51	52
D3-N-MeFOSAA (surr.)	1	%	41	50	52	52
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	0.03	11	0.02	0.25
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	< 0.01	[G01]< 0.06	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	0.04	5.2	0.03	0.16
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	< 0.01	10	< 0.01	[N09]0.18
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	0.02	[N09]83	0.04	0.95
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	< 0.01	6.2	< 0.01	[N09]0.06
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	0.03	[N09]26	0.04	[N09]1.0
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01	< 0.01
13C3-PFBS (surr.)	1	%	108	116	107	90
18O2-PFHxS (surr.)	1	%	103	94	91	74
13C8-PFOS (surr.)	1	%	102	109	79	68
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	0.19	< 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	%	83	53	97	80
13C2-6:2 FTSA (surr.)	1	%	57	110	65	54
13C2-8:2 FTSA (surr.)	1	%	51	45	66	56
13C2-10:2 FTSA (surr.)	1	%	45	55	58	54
PFASs Summations						
Sum (PFHxS + PFOS)*	0.01	ug/L	0.05	109	0.08	1.95
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	0.05	31.5	0.04	1.07
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	0.07	114.5	0.08	2.02
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	1.47	155.39	0.11	2.72
Sum of PFASs (n=30)*	0.1	ug/L	1.51	176.79	0.14	3.12

Client Sample ID			FD01	FB01	RB01
Sample Matrix			Water	Water	Water
Eurofins Sample No.			M23-Se0035571	M23-Se0035572	M23-Se0035573
Date Sampled			Sep 14, 2023	Sep 14, 2023	Sep 14, 2023
Test/Reference	LOR	Unit			
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	0.05	ug/L	2.6	< 0.05	< 0.05
Perfluoropentanoic acid (PFPeA)[N11]	0.01	ug/L	5.4	< 0.01	< 0.01
Perfluorohexanoic acid (PFHxA)[N11]	0.01	ug/L	25	< 0.01	< 0.01
Perfluoroheptanoic acid (PFHpA)[N11]	0.01	ug/L	2.1	< 0.01	< 0.01
Perfluorooctanoic acid (PFOA)[N11]	0.01	ug/L	6.5	< 0.01	< 0.01
Perfluorononanoic acid (PFNA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorodecanoic acid (PFDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluoroundecanoic acid (PFUnDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorododecanoic acid (PFDoDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotridecanoic acid (PFTrDA)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01
Perfluorotetradecanoic acid (PFTeDA)[N11]	0.01	ug/L	< 0.01	< 0.01	< 0.01
13C4-PFBA (surr.)	1	%	110	71	74
13C5-PFPeA (surr.)	1	%	118	96	108
13C5-PFHxA (surr.)	1	%	113	98	110
13C4-PFHpA (surr.)	1	%	112	87	99
13C8-PFOA (surr.)	1	%	103	109	121
13C5-PFNA (surr.)	1	%	68	85	90
13C6-PFDA (surr.)	1	%	44	79	96
13C2-PFUnDA (surr.)	1	%	87	80	91
13C2-PFDoDA (surr.)	1	%	96	79	87
13C2-PFTeDA (surr.)	1	%	139	82	67
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	0.05	ug/L	< 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
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	0.05	ug/L	< 0.05	< 0.05	< 0.05
13C8-FOSA (surr.)	1	%	114	92	99
D3-N-MeFOSA (surr.)	1	%	143	111	122
D5-N-EtFOSA (surr.)	1	%	130	99	110
D7-N-MeFOSE (surr.)	1	%	82	68	66
D9-N-EtFOSE (surr.)	1	%	104	70	76
D5-N-EtFOSAA (surr.)	1	%	74	52	58
D3-N-MeFOSAA (surr.)	1	%	59	51	60
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	0.01	ug/L	13	< 0.01	< 0.01
Perfluorononanesulfonic acid (PFNS)[N15]	0.01	ug/L	[N09]0.04	< 0.01	< 0.01
Perfluoropropanesulfonic acid (PFPrS)[N15]	0.01	ug/L	6.1	< 0.01	< 0.01
Perfluoropentanesulfonic acid (PFPeS)[N15]	0.01	ug/L	12	< 0.01	< 0.01
Perfluorohexanesulfonic acid (PFHxS)[N11]	0.01	ug/L	[N09]96	< 0.01	< 0.01
Perfluoroheptanesulfonic acid (PFHpS)[N15]	0.01	ug/L	7.9	< 0.01	< 0.01
Perfluorooctanesulfonic acid (PFOS)[N11]	0.01	ug/L	[N09]32	< 0.01	< 0.01
Perfluorodecanesulfonic acid (PFDS)[N15]	0.01	ug/L	< 0.01	< 0.01	< 0.01

Client Sample ID			FD01	FB01	RB01
Sample Matrix			Water	Water	Water
Eurofins Sample No.			M23-Se0035571	M23-Se0035572	M23-Se0035573
Date Sampled			Sep 14, 2023	Sep 14, 2023	Sep 14, 2023
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonic acids (PFSAs)					
13C3-PFBS (surr.)	1	%	115	97	111
18O2-PFHxS (surr.)	1	%	91	83	102
13C8-PFOS (surr.)	1	%	98	84	89
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
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	0.05	ug/L	0.25	< 0.05	< 0.05
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	0.01	ug/L	< 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
13C2-4:2 FTSA (surr.)	1	%	63	66	77
13C2-6:2 FTSA (surr.)	1	%	104	53	56
13C2-8:2 FTSA (surr.)	1	%	53	62	69
13C2-10:2 FTSA (surr.)	1	%	82	66	71
PFASs Summations					
Sum (PFHxS + PFOS)*	0.01	ug/L	128	< 0.01	< 0.01
Sum of US EPA PFAS (PFOS + PFOA)*	0.01	ug/L	38.5	< 0.01	< 0.01
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	0.01	ug/L	134.5	< 0.01	< 0.01
Sum of WA DWER PFAS (n=10)*	0.05	ug/L	182.85	< 0.05	< 0.05
Sum of PFASs (n=30)*	0.1	ug/L	208.89	< 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
Eurofins Suite B11F: Cl/SO4/Alkalinity/Total F			
Chloride	Melbourne	Sep 18, 2023	28 Days
- Method: LTM-INO-4270 Anions by Ion Chromatography			
Fluoride	Melbourne	Sep 18, 2023	28 Days
- Method: LTM-INO-4270 Anions by Ion Chromatography			
Sulphate (as SO4)	Melbourne	Sep 18, 2023	28 Days
- Method: LTM-INO-4270 Anions by Ion Chromatography			
Alkalinity (speciated)	Melbourne	Sep 18, 2023	14 Days
- Method: LTM-INO-4250 Alkalinity by Electrometric Titration			
Total Dissolved Solids Dried at 180 °C ± 2 °C	Melbourne	Sep 18, 2023	28 Days
- Method: LTM-INO-4170 Total Dissolved Solids in Water			
Eurofins Suite B11C: Na/K/Ca/Mg	Melbourne	Sep 18, 2023	180 Days
- Method: LTM-MET-3010 Alkali Metals by ICP-AES			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Sep 19, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Sep 19, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Sep 19, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Sep 19, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Sep 15, 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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Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1026487
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 15, 2023 3:42 PM
Due: Sep 22, 2023
Priority: 5 Day
Contact Name: Terrance Wilson

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						Eurofins Suite B11F: Cl/SO4/Alkalinity/Total F	Per- and Polyfluoroalkyl Substances (PFASs)	Eurofins Suite B11C: Na/K/Ca/Mg	Total Dissolved Solids Dried at 180 °C ± 2 °C
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	MW01	Sep 14, 2023		Water	M23-Se0035567	X	X	X	X
2	MW02	Sep 14, 2023		Water	M23-Se0035568	X	X	X	X
3	MW03	Sep 14, 2023		Water	M23-Se0035569	X	X	X	X
4	TW01	Sep 14, 2023		Water	M23-Se0035570	X	X	X	X
5	FD01	Sep 14, 2023		Water	M23-Se0035571		X		
6	FB01	Sep 14, 2023		Water	M23-Se0035572		X		
7	RB01	Sep 14, 2023		Water	M23-Se0035573		X		
Test Counts						4	7	4	4

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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							
Chloride	mg/L	< 1			1	Pass	
Fluoride	mg/L	< 0.5			0.5	Pass	
Sulphate (as SO4)	mg/L	< 5			5	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	mg/L	< 10			10	Pass	
Method Blank							
Alkalinity (speciated)							
Bicarbonate Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Carbonate Alkalinity (as CaCO3)	mg/L	< 10			10	Pass	
Hydroxide Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Total Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
Method Blank							
Alkali Metals							
Calcium	mg/L	< 0.5			0.5	Pass	
Magnesium	mg/L	< 0.5			0.5	Pass	
Potassium	mg/L	< 0.5			0.5	Pass	
Sodium	mg/L	< 0.5			0.5	Pass	
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)							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
Chloride	%	105			70-130	Pass	
Fluoride	%	112			70-130	Pass	
Sulphate (as SO4)	%	100			70-130	Pass	
Total Dissolved Solids Dried at 180 °C ± 2 °C	%	102			70-130	Pass	
LCS - % Recovery							
Alkalinity (speciated)							
Total Alkalinity (as CaCO3)	%	90			70-130	Pass	
LCS - % Recovery							
Alkali Metals							
Calcium	%	92			80-120	Pass	
Magnesium	%	100			80-120	Pass	
Potassium	%	96			80-120	Pass	
Sodium	%	101			80-120	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	105			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	101			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	101			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	98			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	101			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	98			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	90			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	87			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	87			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	77			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	86			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	86			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	84			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	81			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	90			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	87			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	80			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	89			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	88			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	108			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	100			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	83			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	86			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	107			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	111			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	95			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	94			50-150	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)			%	79			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)			%	80			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
				Result 1					
Chloride	M23-Se0036546	NCP	%	75			70-130	Pass	
Sulphate (as SO4)	M23-Se0036546	NCP	%	91			70-130	Pass	
Spike - % Recovery									
Alkali Metals				Result 1					
Calcium	M23-Se0035567	CP	%	99			75-125	Pass	
Magnesium	M23-Se0035567	CP	%	105			75-125	Pass	
Potassium	M23-Se0035567	CP	%	99			75-125	Pass	
Sodium	M23-Se0035567	CP	%	119			75-125	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorononanoic acid (PFNA)	M23-Se0039579	NCP	%	86			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0039579	NCP	%	92			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0039579	NCP	%	104			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0039579	NCP	%	94			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0039579	NCP	%	68			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0037377	NCP	%	89			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Se0039579	NCP	%	84			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0039579	NCP	%	94			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0039579	NCP	%	76			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0039579	NCP	%	83			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0039579	NCP	%	95			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0039579	NCP	%	82			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0039579	NCP	%	105			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorononanesulfonic acid (PFNS)	M23-Se0039579	NCP	%	83			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0037377	NCP	%	78			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0039579	NCP	%	93			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0039579	NCP	%	58			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-Se0039579	NCP	%	91			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0039579	NCP	%	100			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0039579	NCP	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0039579	NCP	%	86			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Se0037377	NCP	%	86			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0037377	NCP	%	85			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0039579	NCP	%	85			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0039579	NCP	%	82			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0039579	NCP	%	82			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorohexanoic acid (PFHxA)	M23-Se0039579	NCP	%	57			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Se0039579	NCP	%	53			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0039579	NCP	%	84			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0039579	NCP	%	110			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Chloride	M23-Se0035371	NCP	mg/L	3000	3000	<1	30%	Pass	
Fluoride	M23-Se0043572	NCP	mg/L	0.8	0.8	1.1	30%	Pass	
Sulphate (as SO4)	M23-Se0035371	NCP	mg/L	44	41	6.7	30%	Pass	
Duplicate									
Alkali Metals				Result 1	Result 2	RPD			
Calcium	M23-Se0035567	CP	mg/L	34	35	1.6	30%	Pass	
Magnesium	M23-Se0035567	CP	mg/L	130	130	<1	30%	Pass	
Potassium	M23-Se0035567	CP	mg/L	33	32	2.0	30%	Pass	
Sodium	M23-Se0035567	CP	mg/L	2400	2300	1.8	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Se0037128	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0037128	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0037128	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0037128	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0037128	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0039578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0039578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0039578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0039578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0039578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0039578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Se0039578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0039578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0039578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0039578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0039578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0039578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0039578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Se0037128	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0039578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0039578	NCP	ug/L	0.50	0.53	5.9	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0037128	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0037128	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0039578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0037128	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0039578	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-Se0039578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0039578	NCP	ug/L	< 0.05	< 0.05	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0039578	NCP	ug/L	< 0.01	< 0.01	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0039578	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
G01	The LORs have been raised due to matrix interference
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
Caitlin Breeze	Senior Analyst-Inorganic
Joseph Edouard	Senior Analyst-PFAS
Mary Makarios	Senior Analyst-Inorganic
Mary Makarios	Senior Analyst-Metal



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	: **EM2314118**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Shirley LeCornu
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9630
Project	: 12611126	Date Samples Received	: 07-Aug-2023 10:20
Order number	: ----	Date Analysis Commenced	: 08-Aug-2023
C-O-C number	: ----	Issue Date	: 09-Aug-2023 16:06
Sampler	: TW/LW		
Site	: ----		
Quote number	: ME/875/20 B - SECONDARY WORK ONLY		
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 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-INJ: Sample EM2314118-001 required dilution due to matrix interferences. LOR values have been adjusted accordingly.
- EP231X-INJ: The direct injection LCMSMS method may be used where the sample matrix is not suitable for Solid Phase Extraction (e.g. significant particulate load) or where only a single sample container is received.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC01B	----	----	----	----
				Sampling date / time	03-Aug-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2314118-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**30.7**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**15.6**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**169**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**5.92**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**22.0**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.10	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.10	µg/L		**4.13**	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**8.83**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**46.9**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**4.58**	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**8.60**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.10	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.10	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.10	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.10	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.10	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.25	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.10	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.25	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.25	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	QC01B	----	----	----	----
				Sampling date / time	03-Aug-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2314118-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.25	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.25	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.10	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.10	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.10	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.94**	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.10	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.10	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**317**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**191**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**296**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**101**	----	----	----	----
13C8-PFOA	----	0.02	%		**100**	----	----	----	----

Surrogate Control Limits

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

QUALITY CONTROL REPORT

Work Order	: **EM2314118**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Shirley LeCornu
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9630
Project	: 12611126	Date Samples Received	: 07-Aug-2023
Order number	: ----	Date Analysis Commenced	: 08-Aug-2023
C-O-C number	: ----	Issue Date	: 09-Aug-2023
Sampler	: TW/LW		
Site	: ----		
Quote number	: ME/875/20 B - SECONDARY WORK ONLY		
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 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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5221119)									
EM2314016-001	Anonymous	EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5221119)									
EM2314016-001	Anonymous	EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5221119) - continued									
EM2314016-001	Anonymous	EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	<0.10	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5221119)									
EM2314016-001	Anonymous	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5221119)									
EM2314016-001	Anonymous	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5221119)									
EM2314016-001	Anonymous	EP231X-INJ: Sum of PFAS	----	0.01	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	<0.02	<0.02	0.0	No Limit
		EP231X-INJ: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.02	<0.02	0.0	No Limit

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5221119)								
EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.444 µg/L	92.0	72.0	130
EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.471 µg/L	96.9	71.0	127
EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.457 µg/L	91.1	68.0	131
EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.477 µg/L	97.9	69.0	134
EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.465 µg/L	89.8	65.0	140
EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.482 µg/L	95.0	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5221119)								
EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	2.5 µg/L	93.2	73.0	129
EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	94.3	72.0	129
EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	99.2	72.0	129
EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	93.0	72.0	130
EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	96.0	71.0	133
EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	93.9	69.0	130
EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	88.1	71.0	129
EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	99.7	69.0	133
EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	99.1	72.0	134
EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	99.6	65.0	144
EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	95.9	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5221119)								
EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	91.0	67.0	137
EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	111	68.0	141
EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	106	70.0	130
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	1.25 µg/L	96.4	70.0	130
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	102	70.0	130
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	106	65.0	136
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	101	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5221119)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5221119) - continued								
EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.469 µg/L	97.1	63.0	143
EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.476 µg/L	101	64.0	140
EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.48 µg/L	107	67.0	138
EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.483 µg/L	90.7	70.0	130
EP231P: PFAS Sums (QCLot: 5221119)								
EP231X-INJ: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5221119)							
EM2314118-001	QC01B	EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.444 µg/L	# Not Determined	72.0	130
		EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.471 µg/L	# Not Determined	71.0	127
		EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.457 µg/L	# Not Determined	68.0	131
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.477 µg/L	# Not Determined	69.0	134
		EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.465 µg/L	# Not Determined	65.0	140
		EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.482 µg/L	106	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5221119)							
EM2314118-001	QC01B	EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	2.5 µg/L	91.9	73.0	129
		EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.5 µg/L	# Not Determined	72.0	129
		EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.5 µg/L	# Not Determined	72.0	129
		EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.5 µg/L	# Not Determined	72.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5221119) - continued							
EM2314118-001	QC01B	EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.5 µg/L	# Not Determined	71.0	133
		EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.5 µg/L	99.0	69.0	130
		EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.5 µg/L	95.5	71.0	129
		EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.5 µg/L	101	69.0	133
		EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.5 µg/L	106	72.0	134
		EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.5 µg/L	104	65.0	144
		EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	1.25 µg/L	102	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5221119)							
EM2314118-001	QC01B	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.5 µg/L	88.9	67.0	137
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	1.25 µg/L	112	68.0	141
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	1.25 µg/L	101	70.0	130
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	1.25 µg/L	115	70.0	130
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	1.25 µg/L	96.5	70.0	130
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.5 µg/L	122	65.0	136
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.5 µg/L	99.1	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5221119)							
EM2314118-001	QC01B	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.469 µg/L	95.3	63.0	143
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.476 µg/L	122	64.0	140
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.48 µg/L	103	67.0	138
		EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.483 µg/L	75.1	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2314118**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Telephone	: +6138549 9630
Project	: 12611126	Date Samples Received	: 07-Aug-2023
Site	: ----	Issue Date	: 09-Aug-2023
Sampler	: TW/LW	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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EM2314118--001	QC01B	**Perfluorobutane sulfonic acid (PFBS)**	375-73-5	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EM2314118--001	QC01B	**Perfluoropentane sulfonic acid (PFPeS)**	2706-91-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EM2314118--001	QC01B	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EM2314118--001	QC01B	**Perfluoroheptane sulfonic acid (PFHpS)**	375-92-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EM2314118--001	QC01B	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2314118--001	QC01B	**Perfluoropentanoic acid (PFPeA)**	2706-90-3	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2314118--001	QC01B	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2314118--001	QC01B	**Perfluoroheptanoic acid (PFHpA)**	375-85-9	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2314118--001	QC01B	**Perfluorooctanoic acid (PFOA)**	335-67-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation

Matrix: **WATER**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-INJ) QC01B	**03-Aug-2023**	**08-Aug-2023**	30-Jan-2024	✓	**09-Aug-2023**	30-Jan-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-INJ) QC01B	**03-Aug-2023**	**08-Aug-2023**	30-Jan-2024	✓	**09-Aug-2023**	30-Jan-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-INJ) QC01B	**03-Aug-2023**	**08-Aug-2023**	30-Jan-2024	✓	**09-Aug-2023**	30-Jan-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-INJ) QC01B	**03-Aug-2023**	**08-Aug-2023**	30-Jan-2024	✓	**09-Aug-2023**	30-Jan-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-INJ) QC01B	**03-Aug-2023**	**08-Aug-2023**	30-Jan-2024	✓	**09-Aug-2023**	30-Jan-2024	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	5	**20.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	5	**20.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with mobile phase solvent. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.

Preparation Methods	Method	Matrix	Method Descriptions
Preparation for PFAS in water.	EP231-PR	WATER	Method presumes direct injection without workup. Preparation includes addition of internal standard and surrogate, and filtration prior to analysis.

CERTIFICATE OF ANALYSIS

Work Order	: **EM2316765**	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	: 12611126	Date Samples Received	: 19-Sep-2023 10:46
Order number	: ----	Date Analysis Commenced	: 20-Sep-2023
C-O-C number	: ----	Issue Date	: 21-Sep-2023 10:47
Sampler	: Eloise Garcia (EG), Raphael Thomas (RT), Terrence Wilson (TW)		
Site	:		
Quote number	: EN/005		
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 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-INJ: Sample EM2316765-001 required dilution due to matrix interferences. LOR values have been adjusted accordingly.
- EP231X-INJ: The direct injection LCMSMS method may be used where the sample matrix is not suitable for Solid Phase Extraction (e.g. significant particulate load) or where only a single sample container is received.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FS01	----	----	----	----
				Sampling date / time	14-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2316765-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L		**12.8**	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L		**13.8**	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L		**95.7**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L		**9.45**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L		**26.2**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L		<0.05	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.10	µg/L		**2.64**	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L		**5.79**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L		**23.2**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L		**2.24**	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L		**5.83**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L		<0.05	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L		<0.05	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L		<0.05	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L		<0.05	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L		<0.05	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L		<0.12	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L		<0.05	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L		<0.12	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L		<0.12	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Sample ID	FS01	----	----	----	----
				Sampling date / time	14-Sep-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2316765-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L		<0.12	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L		<0.12	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L		<0.05	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L		<0.05	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L		<0.05	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L		**0.25**	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L		<0.05	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L		<0.05	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.01	µg/L		**198**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L		**122**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.01	µg/L		**175**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.02	%		**99.6**	----	----	----	----
13C8-PFOA	----	0.02	%		**103**	----	----	----	----

Surrogate Control Limits

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

QUALITY CONTROL REPORT

Work Order	: **EM2316765**	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	: 12611126	Date Samples Received	: 19-Sep-2023
Order number	: ----	Date Analysis Commenced	: 20-Sep-2023
C-O-C number	: ----	Issue Date	: 21-Sep-2023
Sampler	: Eloise Garcia (EG), Raphael Thomas (RT), Terrence Wilson (TW)		
Site	:		
Quote number	: EN/005		
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 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: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5308526)									
EM2316765-001	FS01	EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	95.7	93.8	2.1	0% - 20%
		EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	26.2	25.4	3.0	0% - 20%
		EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	12.8	12.5	2.8	0% - 20%
		EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	13.8	12.5	9.7	0% - 20%
		EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	9.45	9.42	0.3	0% - 20%
		EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.05	<0.05	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5308526)									
EM2316765-001	FS01	EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	5.83	5.84	0.2	0% - 20%
		EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	5.79	5.56	4.1	0% - 20%
		EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	23.2	22.3	4.0	0% - 20%
		EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	2.24	2.22	0.7	0% - 20%
		EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.12	<0.12	0.0	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5308526) - continued									
EM2316765-001	FS01	EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	2.64	2.72	3.1	0% - 50%
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5308526)									
EM2316765-001	FS01	EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.12	<0.12	0.0	No Limit
		EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.12	<0.12	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5308526)									
EM2316765-001	FS01	EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	0.25	0.27	7.4	No Limit
		EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	<0.05	0.0	No Limit
		EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	<0.05	0.0	No Limit
EP231P: PFAS Sums (QC Lot: 5308526)									
EM2316765-001	FS01	EP231X-INJ: Sum of PFAS	----	0.01	µg/L	198	192	2.8	0% - 20%
		EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.01	µg/L	122	119	2.2	0% - 20%
		EP231X-INJ: Sum of PFAS (WA DER List)	----	0.01	µg/L	175	171	2.3	0% - 20%

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

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

Sub-Matrix: **WATER**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5308526)								
EP231X-INJ: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.02	µg/L	<0.02	0.444 µg/L	99.1	72.0	130
EP231X-INJ: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.02	µg/L	<0.02	0.471 µg/L	96.2	71.0	127
EP231X-INJ: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01	µg/L	<0.01	0.457 µg/L	99.2	68.0	131
EP231X-INJ: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.02	µg/L	<0.02	0.477 µg/L	88.5	69.0	134
EP231X-INJ: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01	µg/L	<0.01	0.465 µg/L	90.7	65.0	140
EP231X-INJ: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.02	µg/L	<0.02	0.482 µg/L	88.4	53.0	142
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5308526)								
EP231X-INJ: Perfluorobutanoic acid (PFBA)	375-22-4	0.1	µg/L	<0.10	2.5 µg/L	97.3	73.0	129
EP231X-INJ: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.02	µg/L	<0.02	0.5 µg/L	91.7	72.0	129
EP231X-INJ: Perfluorohexanoic acid (PFHxA)	307-24-4	0.02	µg/L	<0.02	0.5 µg/L	94.5	72.0	129
EP231X-INJ: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.02	µg/L	<0.02	0.5 µg/L	97.4	72.0	130
EP231X-INJ: Perfluorooctanoic acid (PFOA)	335-67-1	0.01	µg/L	<0.01	0.5 µg/L	96.7	71.0	133
EP231X-INJ: Perfluorononanoic acid (PFNA)	375-95-1	0.02	µg/L	<0.02	0.5 µg/L	96.2	69.0	130
EP231X-INJ: Perfluorodecanoic acid (PFDA)	335-76-2	0.02	µg/L	<0.02	0.5 µg/L	96.6	71.0	129
EP231X-INJ: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.02	µg/L	<0.02	0.5 µg/L	105	69.0	133
EP231X-INJ: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.02	µg/L	<0.02	0.5 µg/L	94.6	72.0	134
EP231X-INJ: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.02	µg/L	<0.02	0.5 µg/L	95.0	65.0	144
EP231X-INJ: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.05	µg/L	<0.05	1.25 µg/L	92.4	71.0	132
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5308526)								
EP231X-INJ: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.02	µg/L	<0.02	0.5 µg/L	99.6	67.0	137
EP231X-INJ: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.05	µg/L	<0.05	1.25 µg/L	99.4	68.0	141
EP231X-INJ: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.05	µg/L	<0.05	1.25 µg/L	89.2	70.0	130
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.05	µg/L	<0.05	1.25 µg/L	92.8	70.0	130
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.05	µg/L	<0.05	1.25 µg/L	97.2	70.0	130
EP231X-INJ: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.02	µg/L	<0.02	0.5 µg/L	105	65.0	136
EP231X-INJ: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.02	µg/L	<0.02	0.5 µg/L	89.1	61.0	135
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5308526)								

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5308526) - continued								
EP231X-INJ: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.05	µg/L	<0.05	0.469 µg/L	97.0	63.0	143
EP231X-INJ: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.05	µg/L	<0.05	0.476 µg/L	110	64.0	140
EP231X-INJ: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.05	µg/L	<0.05	0.48 µg/L	97.7	67.0	138
EP231X-INJ: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.05	µg/L	<0.05	0.483 µg/L	86.8	70.0	130
EP231P: PFAS Sums (QCLot: 5308526)								
EP231X-INJ: Sum of PFAS	----	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.01	µg/L	<0.01	----	----	----	----
EP231X-INJ: Sum of PFAS (WA DER List)	----	0.01	µg/L	<0.01	----	----	----	----

Matrix Spike (MS) Report

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

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2316765**	Page	: 1 of 4
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Telephone	: +6138549 9645
Project	: 12611126	Date Samples Received	: 19-Sep-2023
Site	:	Issue Date	: 21-Sep-2023
Sampler	: Eloise Garcia (EG), Raphael Thomas (RT), Terrence Wilson (TW)	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

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	1	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **WATER**

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

Method / ***Container*** / Client Sample ID(s)	***Sample Date***	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	***Date analysed***	*Due for analysis*	*Evaluation*
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-INJ) FS01	**14-Sep-2023**	**20-Sep-2023**	12-Mar-2024	✓	**20-Sep-2023**	12-Mar-2024	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-INJ) FS01	**14-Sep-2023**	**20-Sep-2023**	12-Mar-2024	✓	**20-Sep-2023**	12-Mar-2024	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-INJ) FS01	**14-Sep-2023**	**20-Sep-2023**	12-Mar-2024	✓	**20-Sep-2023**	12-Mar-2024	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-INJ) FS01	**14-Sep-2023**	**20-Sep-2023**	12-Mar-2024	✓	**20-Sep-2023**	12-Mar-2024	✓
EP231P: PFAS Sums							
HDPE (no PTFE) (EP231X-INJ) FS01	**14-Sep-2023**	**20-Sep-2023**	12-Mar-2024	✓	**20-Sep-2023**	12-Mar-2024	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	1	**100.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	1	1	**100.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	0	1	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-INJ	WATER	In house: Direct injection analysis of fresh waters after dilution (1:1) with mobile phase solvent. Analysis by LC-Electrospray-MS-MS, Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.

Preparation Methods	Method	Matrix	Method Descriptions
Preparation for PFAS in water.	EP231-PR	WATER	Method presumes direct injection without workup. Preparation includes addition of internal standard and surrogate, and filtration prior to analysis.

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IANZ# 1290

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

Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1008159
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Jul 14, 2023 5:27 PM
Due: Jul 19, 2023
Priority: 3 Day
Contact Name: Terrance Wilson

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	SS01	Jul 14, 2023		Soil	M23-Jl0031517	X	X
2	SS02	Jul 14, 2023		Soil	M23-Jl0031518	X	X
3	SS03	Jul 14, 2023		Soil	M23-Jl0031519	X	X
4	SS04	Jul 14, 2023		Soil	M23-Jl0031520	X	X
5	FD01	Jul 14, 2023		Soil	M23-Jl0031521	X	X
Test Counts						5	5

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Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Terrance Wilson
Project name:	MFS Oakden DSI
Project ID:	12611126
Turnaround time:	3 Day
Date/Time received	Jul 14, 2023 5:27 PM
Eurofins reference	1008159

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 Terrance Wilson - Terrence.Wilson@ghd.com.

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

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: **Terrance Wilson**

Report **1008159-S**
Project name MFS Oakden DSI
Project ID 12611126
Received Date Jul 14, 2023

Client Sample ID			**SS01**	**SS02**	**SS03**	**SS04**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M23-JI0031517**	**M23-JI0031518**	**M23-JI0031519**	**M23-JI0031520**
Date Sampled			**Jul 14, 2023**	**Jul 14, 2023**	**Jul 14, 2023**	**Jul 14, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	32	23	23	16
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	%	65	65	62	70
13C5-PFPeA (surr.)	1	%	70	71	70	78
13C5-PFHxA (surr.)	1	%	79	86	82	92
13C4-PFHpA (surr.)	1	%	72	74	71	78
13C8-PFOA (surr.)	1	%	65	69	66	70
13C5-PFNA (surr.)	1	%	68	71	68	75
13C6-PFDA (surr.)	1	%	62	61	68	66
13C2-PFUnDA (surr.)	1	%	61	68	45	28
13C2-PFDoDA (surr.)	1	%	44	63	63	64
13C2-PFTeDA (surr.)	1	%	48	54	65	67
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	%	51	53	51	45

Client Sample ID			SS01	SS02	SS03	SS04
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0031517	M23-JI0031518	M23-JI0031519	M23-JI0031520
Date Sampled			Jul 14, 2023	Jul 14, 2023	Jul 14, 2023	Jul 14, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D3-N-MeFOSA (surr.)	1	%	81	100	91	93
D5-N-EtFOSA (surr.)	1	%	87	101	96	104
D7-N-MeFOSE (surr.)	1	%	75	83	71	66
D9-N-EtFOSE (surr.)	1	%	72	78	75	76
D5-N-EtFOSAA (surr.)	1	%	78	92	75	54
D3-N-MeFOSAA (surr.)	1	%	104	115	90	65
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]6.2	[N09]7.4	[N09]16	[N09]66
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	72	73	66	80
18O2-PFHxS (surr.)	1	%	65	66	63	68
13C8-PFOS (surr.)	1	%	70	74	81	79
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	%	75	77	74	96
13C2-6:2 FTSA (surr.)	1	%	79	90	70	75
13C2-8:2 FTSA (surr.)	1	%	100	104	92	89
13C2-10:2 FTSA (surr.)	1	%	96	102	71	63
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	6.2	7.4	16	66
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	6.2	7.4	16	66
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	6.2	7.4	16	66
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	16	66
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	66

Client Sample ID			FD01
Sample Matrix			Soil
Eurofins Sample No.			M23-JI0031521
Date Sampled			Jul 14, 2023
Test/Reference	LOR	Unit	
Sample Properties			
% Moisture	1	%	17

Client Sample ID			FD01
Sample Matrix			Soil
Eurofins Sample No.			M23-JI0031521
Date Sampled			Jul 14, 2023
Test/Reference	LOR	Unit	
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	%	73
13C5-PFPeA (surr.)	1	%	81
13C5-PFHxA (surr.)	1	%	87
13C4-PFHpA (surr.)	1	%	77
13C8-PFOA (surr.)	1	%	70
13C5-PFNA (surr.)	1	%	76
13C6-PFDA (surr.)	1	%	71
13C2-PFUnDA (surr.)	1	%	27
13C2-PFDoDA (surr.)	1	%	64
13C2-PFTeDA (surr.)	1	%	60
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
13C8-FOSA (surr.)	1	%	42
D3-N-MeFOSA (surr.)	1	%	99
D5-N-EtFOSA (surr.)	1	%	105
D7-N-MeFOSE (surr.)	1	%	59
D9-N-EtFOSE (surr.)	1	%	70
D5-N-EtFOSAA (surr.)	1	%	39
D3-N-MeFOSAA (surr.)	1	%	44
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]55
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5
13C3-PFBS (surr.)	1	%	85

Client Sample ID			FD01
Sample Matrix			Soil
Eurofins Sample No.			M23-JI0031521
Date Sampled			Jul 14, 2023
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonic acids (PFSAs)			
18O2-PFHxS (surr.)	1	%	66
13C8-PFOS (surr.)	1	%	87
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	%	100
13C2-6:2 FTSA (surr.)	1	%	72
13C2-8:2 FTSA (surr.)	1	%	86
13C2-10:2 FTSA (surr.)	1	%	48
PFASs Summations			
Sum (PFHxS + PFOS)*	5	ug/kg	55
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	55
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	55
Sum of WA DWER PFAS (n=10)*	10	ug/kg	55
Sum of PFASs (n=30)*	50	ug/kg	55

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Jul 15, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Jul 15, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Jul 15, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Jul 15, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Jul 15, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Jul 15, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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email: EnviroSales@eurofins.com

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

Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1008159
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Jul 14, 2023 5:27 PM
Due: Jul 19, 2023
Priority: 3 Day
Contact Name: Terrance Wilson

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	SS01	Jul 14, 2023		Soil	M23-Jl0031517	X	X
2	SS02	Jul 14, 2023		Soil	M23-Jl0031518	X	X
3	SS03	Jul 14, 2023		Soil	M23-Jl0031519	X	X
4	SS04	Jul 14, 2023		Soil	M23-Jl0031520	X	X
5	FD01	Jul 14, 2023		Soil	M23-Jl0031521	X	X
Test Counts						5	5

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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)	%	87			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	84			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	85			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	92			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	91			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	83			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	98			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	106			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	92			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	90			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	94			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	83			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	92			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	70			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	85			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	90			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	93			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	93			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	92			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	51			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	97			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	85			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	86			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	59			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	89			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	121			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	89			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	92			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-JI0031579	NCP	%	91			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-JI0031579	NCP	%	90			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-JI0031579	NCP	%	94			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-JI0031579	NCP	%	103			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-JI0031579	NCP	%	101			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-JI0031579	NCP	%	98			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-JI0031579	NCP	%	101			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-JI0031579	NCP	%	111			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-JI0031579	NCP	%	97			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-JI0031579	NCP	%	96			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-JI0031579	NCP	%	97			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-JI0031579	NCP	%	86			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-JI0031579	NCP	%	94			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-JI0031579	NCP	%	70			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-JI0031579	NCP	%	108			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-JI0031579	NCP	%	93			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-JI0031579	NCP	%	95			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-JI0031579	NCP	%	95			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-JI0031579	NCP	%	92			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-JI0031579	NCP	%	114			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-JI0031579	NCP	%	93			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-JI0031579	NCP	%	81			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-JI0031579	NCP	%	84			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-JI0031579	NCP	%	127			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-JI0031579	NCP	%	90			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-JI0031579	NCP	%	72			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-JI0031579	NCP	%	85			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-JI0031579	NCP	%	88			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-JI0031579	NCP	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-JI0031579	NCP	%	96			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-JI0031517	CP	%	32	34	7.3	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-JI0028445	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-JI0028445	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-JI0028445	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-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-JI0028445	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-JI0028445	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-JI0028445	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:

Adrian Tabacchiera	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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Adelaide
SA 5001

Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1009731
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Jul 20, 2023 5:29 PM
Due: Jul 27, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	SS05	Jul 18, 2023		Soil	M23-Jl0044428		X	X
2	SS06	Jul 18, 2023		Soil	M23-Jl0044429		X	X
3	SS07	Jul 18, 2023		Soil	M23-Jl0044430		X	X
4	SS08	Jul 18, 2023		Soil	M23-Jl0044431		X	X
5	SS09	Jul 18, 2023		Soil	M23-Jl0044432		X	X
6	BH08_0-0.1	Jul 18, 2023		Soil	M23-Jl0044433		X	X
7	BH08_1.9-2.0	Jul 18, 2023		Soil	M23-Jl0044434		X	X
8	BH01_0-0.1	Jul 18, 2023		Soil	M23-Jl0044435		X	X
9	BH01_1.4-1.5	Jul 18, 2023		Soil	M23-Jl0044436		X	X
10	BH06_0.4-0.5	Jul 18, 2023		Soil	M23-Jl0044437		X	X
11	BH06_2.9-3.0	Jul 18, 2023		Soil	M23-Jl0044438		X	X
12	BH07_0.08-0.2	Jul 18, 2023		Soil	M23-Jl0044439		X	X
13	BH07_2.8-2.9	Jul 18, 2023		Soil	M23-Jl0044440		X	X

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

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Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1009731
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Jul 20, 2023 5:29 PM
Due: Jul 27, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
14	BH07_PAVER	Jul 18, 2023		Soil	M23-Jl0044441		X	X
15	BH04_0.5-0.65	Jul 18, 2023		Soil	M23-Jl0044442		X	X
16	BH04_2.5-2.6	Jul 18, 2023		Soil	M23-Jl0044443		X	X
17	BH04_PAVER	Jul 18, 2023		Soil	M23-Jl0044444		X	X
18	FD02	Jul 18, 2023		Soil	M23-Jl0044445		X	X
19	FS02	Jul 18, 2023		Soil	M23-Jl0044446		X	X
20	FD03	Jul 18, 2023		Soil	M23-Jl0044447		X	X
21	FS03	Jul 18, 2023		Soil	M23-Jl0044448		X	X
22	RB01	Jul 18, 2023		Water	M23-Jl0044449			X
23	BH05_0.08-0.18	Jul 19, 2023		Soil	M23-Jl0044450		X	X
24	BH05_3.0-3.15	Jul 19, 2023		Soil	M23-Jl0044451		X	X
25	BH05_PAVER	Jul 19, 2023		Soil	M23-Jl0044452		X	X
26	BH03_0.5-0.6	Jul 19, 2023		Soil	M23-Jl0044453		X	X
27	BH03_1.5-1.7	Jul 19, 2023		Soil	M23-Jl0044454		X	X
28	BH02_0-0.1	Jul 19, 2023		Soil	M23-Jl0044455		X	X

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
29	BH02_2.7-2.8	Jul 19, 2023		Soil	M23-Jl0044456		X	X
30	FD04	Jul 19, 2023		Soil	M23-Jl0044457		X	X
31	FS04	Jul 19, 2023		Soil	M23-Jl0044458		X	X
32	RB02	Jul 19, 2023		Water	M23-Jl0044459			X
33	BH08_0.37-0.45	Jul 18, 2023		Soil	M23-Jl0044460	X		
34	BH08_0.8-0.9	Jul 18, 2023		Soil	M23-Jl0044461	X		
35	BH08_2.9-3.0	Jul 18, 2023		Soil	M23-Jl0044462	X		
36	BH08_3.9-4.0	Jul 18, 2023		Soil	M23-Jl0044463	X		
37	BH08_4.9-5.0	Jul 18, 2023		Soil	M23-Jl0044464	X		
38	BH01_0.3-0.4	Jul 18, 2023		Soil	M23-Jl0044465	X		
39	BH01_0.85-0.95	Jul 18, 2023		Soil	M23-Jl0044466	X		
40	BH01_1.9-2.0	Jul 18, 2023		Soil	M23-Jl0044467	X		
41	BH01_2.25-2.35	Jul 18, 2023		Soil	M23-Jl0044468	X		
42	BH01_2.85-3.0	Jul 18, 2023		Soil	M23-Jl0044469	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 Site# 1254	NATA# 1261 Site# 25403	NATA# 1261 Site# 18217	NATA# 1261 Site# 25466	NATA# 1261 Site# 20794	Site# 25079 & 25289

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
43	BH01_3.9-4.0	Jul 18, 2023		Soil	M23-Jl0044470	X		
44	BH01_4.9-5.0	Jul 18, 2023		Soil	M23-Jl0044471	X		
45	BH06_0-0.1	Jul 18, 2023		Soil	M23-Jl0044472	X		
46	BH06_0.9-1.0	Jul 18, 2023		Soil	M23-Jl0044473	X		
47	BH06_1.5-1.6	Jul 18, 2023		Soil	M23-Jl0044474	X		
48	BH06_1.9-2.0	Jul 18, 2023		Soil	M23-Jl0044475	X		
49	BH06_2.4-2.5	Jul 18, 2023		Soil	M23-Jl0044476	X		
50	BH06_3.3-3.4	Jul 18, 2023		Soil	M23-Jl0044477	X		
51	BH06_4.4-4.5	Jul 18, 2023		Soil	M23-Jl0044478	X		
52	BH06_4.9-5.0	Jul 18, 2023		Soil	M23-Jl0044479	X		
53	BH07_0.25-0.35	Jul 18, 2023		Soil	M23-Jl0044480	X		
54	BH07_0.8-0.9	Jul 18, 2023		Soil	M23-Jl0044481	X		
55	BH07_1.1-1.25	Jul 18, 2023		Soil	M23-Jl0044482	X		
56	BH07_1.65-1.75	Jul 18, 2023		Soil	M23-Jl0044483	X		

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
57	BH07_2.25-2.35	Jul 18, 2023		Soil	M23-Jl0044484	X		
58	BH07_3.8-3.9	Jul 18, 2023		Soil	M23-Jl0044485	X		
59	BH07_4.9-5.0	Jul 18, 2023		Soil	M23-Jl0044486	X		
60	BH04_0.08-0.18	Jul 18, 2023		Soil	M23-Jl0044487	X		
61	BH04_0.3-0.4	Jul 18, 2023		Soil	M23-Jl0044488	X		
62	BH04_1.0-1.15	Jul 18, 2023		Soil	M23-Jl0044489	X		
63	BH04_1.55-1.65	Jul 18, 2023		Soil	M23-Jl0044490	X		
64	BH04_2.9-3.0	Jul 18, 2023		Soil	M23-Jl0044491	X		
65	BH05_0.4-0.55	Jul 19, 2023		Soil	M23-Jl0044492	X		
66	BH05_0.75-0.85	Jul 19, 2023		Soil	M23-Jl0044493	X		
67	BH05_1.25-1.35	Jul 19, 2023		Soil	M23-Jl0044494	X		
68	BH05_2.25-2.35	Jul 19, 2023		Soil	M23-Jl0044495	X		

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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
69	BH05_4.0-4.15	Jul 19, 2023		Soil	M23-Jl0044496	X		
70	BH05_4.9-5.0	Jul 19, 2023		Soil	M23-Jl0044497	X		
71	BH03_0-0.1	Jul 19, 2023		Soil	M23-Jl0044498	X		
72	BH03_0.3-0.4	Jul 19, 2023		Soil	M23-Jl0044499	X		
73	BH03_0.9-1.0	Jul 19, 2023		Soil	M23-Jl0044500	X		
74	BH03_2.6-2.7	Jul 19, 2023		Soil	M23-Jl0044501	X		
75	BH03_3.2-3.3	Jul 19, 2023		Soil	M23-Jl0044502	X		
76	BH03_4.2-4.3	Jul 19, 2023		Soil	M23-Jl0044503	X		
77	BH03_4.9-5.0	Jul 19, 2023		Soil	M23-Jl0044504	X		
78	BH02_0.4-0.5	Jul 19, 2023		Soil	M23-Jl0044505	X		
79	BH02_0.6-0.7	Jul 19, 2023		Soil	M23-Jl0044506	X		
80	BH02_0.8-0.9	Jul 19, 2023		Soil	M23-Jl0044507	X		
81	BH02_1.4-1.5	Jul 19, 2023		Soil	M23-Jl0044508	X		
82	BH02_1.9-2.0	Jul 19, 2023		Soil	M23-Jl0044509	X		
83	BH02_3.8-4.0	Jul 19, 2023		Soil	M23-Jl0044510	X		
Test Counts						51	30	32

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Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Tom Duncan
Project name:	MFS Oakden DSI
Project ID:	12611126
Turnaround time:	5 Day
Date/Time received	Jul 20, 2023 5:29 PM
Eurofins reference	1009731

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.

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 **1009731-S**
Project name MFS Oakden DSI
Project ID 12611126
Received Date Jul 20, 2023

Client Sample ID			**SS05**	**SS06**	**SS07**	**SS08**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M23-JI0044428**	**M23-JI0044429**	**M23-JI0044430**	**M23-JI0044431**
Date Sampled			**Jul 18, 2023**	**Jul 18, 2023**	**Jul 18, 2023**	**Jul 18, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	18	19	13	9.8
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	%	139	128	129	135
13C5-PFPeA (surr.)	1	%	102	91	94	100
13C5-PFHxA (surr.)	1	%	103	97	100	106
13C4-PFHpA (surr.)	1	%	95	91	92	99
13C8-PFOA (surr.)	1	%	84	89	91	101
13C5-PFNA (surr.)	1	%	73	92	95	115
13C6-PFDA (surr.)	1	%	120	113	113	118
13C2-PFUnDA (surr.)	1	%	79	74	81	85
13C2-PFDoDA (surr.)	1	%	76	81	84	99
13C2-PFTeDA (surr.)	1	%	59	70	70	102
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	%	59	76	67	93

Client Sample ID			SS05	SS06	SS07	SS08
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044428	M23-JI0044429	M23-JI0044430	M23-JI0044431
Date Sampled			Jul 18, 2023	Jul 18, 2023	Jul 18, 2023	Jul 18, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D3-N-MeFOSA (surr.)	1	%	79	82	94	106
D5-N-EtFOSA (surr.)	1	%	78	75	80	86
D7-N-MeFOSE (surr.)	1	%	68	78	85	96
D9-N-EtFOSE (surr.)	1	%	64	66	76	71
D5-N-EtFOSAA (surr.)	1	%	87	98	80	118
D3-N-MeFOSAA (surr.)	1	%	54	79	76	119
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]8.7	[N09]29	[N09]41	[N09]14
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	106	98	105	104
18O2-PFHxS (surr.)	1	%	84	88	91	105
13C8-PFOS (surr.)	1	%	90	62	76	64
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	%	95	96	95	97
13C2-6:2 FTSA (surr.)	1	%	70	82	85	88
13C2-8:2 FTSA (surr.)	1	%	55	93	97	108
13C2-10:2 FTSA (surr.)	1	%	68	91	84	123
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	8.7	29	41	14
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	8.7	29	41	14
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	8.7	29	41	14
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	29	41	14
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			SS09	BH08_0-0.1	BH08_1.9-2.0	BH01_0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044432	M23-JI0044433	M23-JI0044434	M23-JI0044435
Date Sampled			Jul 18, 2023	Jul 18, 2023	Jul 18, 2023	Jul 18, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	14	30	16	18

Client Sample ID			SS09	BH08_0-0.1	BH08_1.9-2.0	BH01_0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044432	M23-JI0044433	M23-JI0044434	M23-JI0044435
Date Sampled			Jul 18, 2023	Jul 18, 2023	Jul 18, 2023	Jul 18, 2023
Test/Reference	LOR	Unit				
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	%	132	133	127	128
13C5-PFPeA (surr.)	1	%	97	98	99	73
13C5-PFHxA (surr.)	1	%	104	103	102	105
13C4-PFHpA (surr.)	1	%	96	91	102	85
13C8-PFOA (surr.)	1	%	91	86	105	71
13C5-PFNA (surr.)	1	%	101	82	114	53
13C6-PFDA (surr.)	1	%	125	114	128	88
13C2-PFUnDA (surr.)	1	%	92	87	79	66
13C2-PFDoDA (surr.)	1	%	99	82	108	52
13C2-PFTeDA (surr.)	1	%	89	69	101	34
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	%	80	56	107	18
D3-N-MeFOSA (surr.)	1	%	107	87	109	60
D5-N-EtFOSA (surr.)	1	%	95	67	96	52
D7-N-MeFOSE (surr.)	1	%	104	66	116	53
D9-N-EtFOSE (surr.)	1	%	91	57	104	52
D5-N-EtFOSAA (surr.)	1	%	95	75	136	36
D3-N-MeFOSAA (surr.)	1	%	48	37	137	12
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	< 5	[N09]14	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	[N09]66	[N09]18	5.4
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	104	109	110	101

Client Sample ID			SS09	BH08_0-0.1	BH08_1.9-2.0	BH01_0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044432	M23-JI0044433	M23-JI0044434	M23-JI0044435
Date Sampled			Jul 18, 2023	Jul 18, 2023	Jul 18, 2023	Jul 18, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
18O2-PFHxS (surr.)	1	%	91	85	109	77
13C8-PFOS (surr.)	1	%	90	72	84	68
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	%	98	92	86	45
13C2-6:2 FTSA (surr.)	1	%	87	70	87	51
13C2-8:2 FTSA (surr.)	1	%	87	71	113	26
13C2-10:2 FTSA (surr.)	1	%	60	52	142	18
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	66	32	5.4
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	66	18	5.4
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	66	32	5.4
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	66	32	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	66	< 50	< 50

Client Sample ID			BH01_1.4-1.5	BH06_0.4-0.5	BH06_2.9-3.0	BH07_0.08-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044436	M23-JI0044437	M23-JI0044438	M23-JI0044439
Date Sampled			Jul 18, 2023	Jul 18, 2023	Jul 18, 2023	Jul 18, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	10	26	26	7.0
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	8.3	< 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	%	135	127	124	140
13C5-PFPeA (surr.)	1	%	101	93	96	102
13C5-PFHxA (surr.)	1	%	106	95	100	112
13C4-PFHpA (surr.)	1	%	100	93	99	104
13C8-PFOA (surr.)	1	%	99	92	102	109
13C5-PFNA (surr.)	1	%	110	105	112	111
13C6-PFDA (surr.)	1	%	137	126	125	124
13C2-PFUnDA (surr.)	1	%	87	90	83	91

Client Sample ID			BH01_1.4-1.5	BH06_0.4-0.5	BH06_2.9-3.0	BH07_0.08-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044436	M23-JI0044437	M23-JI0044438	M23-JI0044439
Date Sampled			Jul 18, 2023	Jul 18, 2023	Jul 18, 2023	Jul 18, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C2-PFDoDA (surr.)	1	%	109	100	102	105
13C2-PFTeDA (surr.)	1	%	102	102	106	116
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	%	96	102	104	106
D3-N-MeFOSA (surr.)	1	%	99	111	113	123
D5-N-EtFOSA (surr.)	1	%	89	97	100	105
D7-N-MeFOSE (surr.)	1	%	113	109	114	120
D9-N-EtFOSE (surr.)	1	%	99	110	116	111
D5-N-EtFOSAA (surr.)	1	%	129	120	136	134
D3-N-MeFOSAA (surr.)	1	%	125	126	136	136
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	[N09]7.3	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	[N09]96	[N09]7.2	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	[N09]19	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	110	97	108	108
18O2-PFHxS (surr.)	1	%	104	92	107	112
13C8-PFOS (surr.)	1	%	96	83	88	93
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	%	84	86	90	98
13C2-6:2 FTSA (surr.)	1	%	81	78	76	80
13C2-8:2 FTSA (surr.)	1	%	102	109	109	120
13C2-10:2 FTSA (surr.)	1	%	138	126	131	130
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	115	7.2	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	19	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	115	7.2	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	123.3	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	130.6	< 50	< 50

Client Sample ID			BH07_2.8-2.9	BH07_PAVER	BH04_0.5-0.65	BH04_2.5-2.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044440	M23-JI0044441	M23-JI0044442	M23-JI0044443
Date Sampled			Jul 18, 2023	Jul 18, 2023	Jul 18, 2023	Jul 18, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	20	8.1	27	22
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	9.3	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	21	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	[N09]8.0	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	[N09]16	< 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	%	127	134	124	126
13C5-PFPeA (surr.)	1	%	98	103	92	96
13C5-PFHxA (surr.)	1	%	102	109	95	100
13C4-PFHpA (surr.)	1	%	101	108	95	96
13C8-PFOA (surr.)	1	%	104	109	92	100
13C5-PFNA (surr.)	1	%	115	123	107	114
13C6-PFDA (surr.)	1	%	104	138	120	104
13C2-PFUnDA (surr.)	1	%	76	91	88	69
13C2-PFDoDA (surr.)	1	%	89	102	99	95
13C2-PFTeDA (surr.)	1	%	110	109	97	97
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	%	104	113	105	105
D3-N-MeFOSA (surr.)	1	%	119	130	114	116
D5-N-EtFOSA (surr.)	1	%	105	111	105	105
D7-N-MeFOSE (surr.)	1	%	109	127	103	101
D9-N-EtFOSE (surr.)	1	%	116	109	107	107
D5-N-EtFOSAA (surr.)	1	%	131	130	106	121
D3-N-MeFOSAA (surr.)	1	%	124	129	117	128
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	6.4	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	6.6	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	[N09]7.6	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	[N09]130	[N09]16
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	[N09]22	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	[N09]9.1	[N09]1200	[N09]7.8

Client Sample ID			BH07_2.8-2.9	BH07_PAVER	BH04_0.5-0.65	BH04_2.5-2.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044440	M23-JI0044441	M23-JI0044442	M23-JI0044443
Date Sampled			Jul 18, 2023	Jul 18, 2023	Jul 18, 2023	Jul 18, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	105	112	98	107
18O2-PFHxS (surr.)	1	%	99	114	79	103
13C8-PFOS (surr.)	1	%	56	69	57	71
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	74	< 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	%	87	93	94	87
13C2-6:2 FTSA (surr.)	1	%	86	90	73	82
13C2-8:2 FTSA (surr.)	1	%	103	116	112	111
13C2-10:2 FTSA (surr.)	1	%	139	127	121	131
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	9.1	1330	23.8
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	9.1	1216	7.8
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	9.1	1346	23.8
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	1464.7	23.8
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	1500.9	< 50

Client Sample ID			BH04_PAVER	FD02	FD03	BH05_0.08-0.18
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044444	M23-JI0044445	M23-JI0044447	M23-JI0044450
Date Sampled			Jul 18, 2023	Jul 18, 2023	Jul 18, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	4.1	6.6	20	7.9
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	%	128	137	111	127
13C5-PFPeA (surr.)	1	%	95	102	84	94
13C5-PFHxA (surr.)	1	%	102	105	89	99
13C4-PFHpA (surr.)	1	%	100	104	84	97
13C8-PFOA (surr.)	1	%	100	108	87	100

Client Sample ID			BH04_PAVER	FD02	FD03	BH05_0.08-0.18
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044444	M23-JI0044445	M23-JI0044447	M23-JI0044450
Date Sampled			Jul 18, 2023	Jul 18, 2023	Jul 18, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C5-PFNA (surr.)	1	%	115	119	86	114
13C6-PFDA (surr.)	1	%	117	136	102	124
13C2-PFUnDA (surr.)	1	%	85	82	76	87
13C2-PFDoDA (surr.)	1	%	97	102	80	97
13C2-PFTeDA (surr.)	1	%	102	106	82	100
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	%	98	112	79	101
D3-N-MeFOSA (surr.)	1	%	116	123	95	116
D5-N-EtFOSA (surr.)	1	%	102	103	84	103
D7-N-MeFOSE (surr.)	1	%	112	108	93	102
D9-N-EtFOSE (surr.)	1	%	103	106	89	102
D5-N-EtFOSAA (surr.)	1	%	123	125	92	116
D3-N-MeFOSAA (surr.)	1	%	118	120	102	121
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]80	< 5	[N09]22	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	96	108	86	100
18O2-PFHxS (surr.)	1	%	102	108	86	98
13C8-PFOS (surr.)	1	%	61	79	69	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	%	92	95	86	94
13C2-6:2 FTSA (surr.)	1	%	89	90	83	86
13C2-8:2 FTSA (surr.)	1	%	109	122	90	105
13C2-10:2 FTSA (surr.)	1	%	109	129	103	123

Client Sample ID			BH04_PAVER	FD02	FD03	BH05_0.08-0.18
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044444	M23-JI0044445	M23-JI0044447	M23-JI0044450
Date Sampled			Jul 18, 2023	Jul 18, 2023	Jul 18, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	80	< 5	22	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	80	< 5	22	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	80	< 5	22	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	80	< 10	22	< 10
Sum of PFASs (n=30)*	50	ug/kg	80	< 50	< 50	< 50

Client Sample ID			BH05_3.0-3.15	BH05_PAVER	BH03_0.5-0.6	BH03_1.5-1.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044451	M23-JI0044452	M23-JI0044453	M23-JI0044454
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	23	4.2	9.8	22
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	%	129	129	130	132
13C5-PFPeA (surr.)	1	%	99	93	100	94
13C5-PFHxA (surr.)	1	%	106	103	104	105
13C4-PFHpA (surr.)	1	%	102	95	100	101
13C8-PFOA (surr.)	1	%	107	83	101	105
13C5-PFNA (surr.)	1	%	123	86	116	116
13C6-PFDA (surr.)	1	%	88	122	132	101
13C2-PFUnDA (surr.)	1	%	68	70	83	72
13C2-PFDoDA (surr.)	1	%	94	93	101	95
13C2-PFTeDA (surr.)	1	%	104	87	97	111
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	%	104	81	101	101

Client Sample ID			BH05_3.0-3.15	BH05_PAVER	BH03_0.5-0.6	BH03_1.5-1.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044451	M23-JI0044452	M23-JI0044453	M23-JI0044454
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D3-N-MeFOSA (surr.)	1	%	117	111	116	116
D5-N-EtFOSA (surr.)	1	%	106	97	108	109
D7-N-MeFOSE (surr.)	1	%	108	97	102	101
D9-N-EtFOSE (surr.)	1	%	115	99	107	100
D5-N-EtFOSAA (surr.)	1	%	132	113	118	128
D3-N-MeFOSAA (surr.)	1	%	123	90	115	122
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	[N09]10
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	102	99	107	106
18O2-PFHxS (surr.)	1	%	106	91	104	107
13C8-PFOS (surr.)	1	%	67	75	69	64
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	%	97	85	100	78
13C2-6:2 FTSA (surr.)	1	%	93	69	83	91
13C2-8:2 FTSA (surr.)	1	%	112	88	109	108
13C2-10:2 FTSA (surr.)	1	%	125	101	112	121
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	10
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	10
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	10
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH02_0-0.1	BH02_2.7-2.8	FD04
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044455	M23-JI0044456	M23-JI0044457
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit			
Sample Properties					
% Moisture	1	%	22	21	18

Client Sample ID			BH02_0-0.1	BH02_2.7-2.8	FD04
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044455	M23-JI0044456	M23-JI0044457
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit			
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	123	122	128
13C5-PFPeA (surr.)	1	%	89	94	95
13C5-PFHxA (surr.)	1	%	95	99	99
13C4-PFHpA (surr.)	1	%	86	94	95
13C8-PFOA (surr.)	1	%	78	97	98
13C5-PFNA (surr.)	1	%	77	115	113
13C6-PFDA (surr.)	1	%	105	110	116
13C2-PFUnDA (surr.)	1	%	70	75	74
13C2-PFDoDA (surr.)	1	%	73	87	88
13C2-PFTeDA (surr.)	1	%	58	89	86
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	62	94	96
D3-N-MeFOSA (surr.)	1	%	86	103	111
D5-N-EtFOSA (surr.)	1	%	81	93	96
D7-N-MeFOSE (surr.)	1	%	75	97	95
D9-N-EtFOSE (surr.)	1	%	72	96	95
D5-N-EtFOSAA (surr.)	1	%	85	110	117
D3-N-MeFOSAA (surr.)	1	%	61	116	100
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]110	< 5	[N09]82
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	96	101	97

Client Sample ID			BH02_0-0.1	BH02_2.7-2.8	FD04
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M23-JI0044455	M23-JI0044456	M23-JI0044457
Date Sampled			Jul 19, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonic acids (PFSAs)					
18O2-PFHxS (surr.)	1	%	81	100	96
13C8-PFOS (surr.)	1	%	65	67	64
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	94	88	99
13C2-6:2 FTSA (surr.)	1	%	77	91	94
13C2-8:2 FTSA (surr.)	1	%	61	110	100
13C2-10:2 FTSA (surr.)	1	%	74	110	109
PFASs Summations					
Sum (PFHxS + PFOS)*	5	ug/kg	110	< 5	82
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	110	< 5	82
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	110	< 5	82
Sum of WA DWER PFAS (n=10)*	10	ug/kg	110	< 10	82
Sum of PFASs (n=30)*	50	ug/kg	110	< 50	82

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Jul 20, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Jul 22, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Jul 22, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Jul 22, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Jul 22, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Jul 20, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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Fax: 08 8111 6699

Received: Jul 20, 2023 5:29 PM
Due: Jul 27, 2023
Priority: 5 Day
Contact Name: Tom Duncan

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	SS05	Jul 18, 2023		Soil	M23-Jl0044428			X	X
2	SS06	Jul 18, 2023		Soil	M23-Jl0044429			X	X
3	SS07	Jul 18, 2023		Soil	M23-Jl0044430			X	X
4	SS08	Jul 18, 2023		Soil	M23-Jl0044431			X	X
5	SS09	Jul 18, 2023		Soil	M23-Jl0044432			X	X
6	BH08_0-0.1	Jul 18, 2023		Soil	M23-Jl0044433			X	X
7	BH08_1.9-2.0	Jul 18, 2023		Soil	M23-Jl0044434			X	X
8	BH01_0-0.1	Jul 18, 2023		Soil	M23-Jl0044435			X	X
9	BH01_1.4-1.5	Jul 18, 2023		Soil	M23-Jl0044436			X	X
10	BH06_0.4-0.5	Jul 18, 2023		Soil	M23-Jl0044437			X	X
11	BH06_2.9-3.0	Jul 18, 2023		Soil	M23-Jl0044438			X	X
12	BH07_0.08-0.2	Jul 18, 2023		Soil	M23-Jl0044439			X	X
13	BH07_2.8-2.9	Jul 18, 2023		Soil	M23-Jl0044440			X	X

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Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1009731
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Jul 20, 2023 5:29 PM
Due: Jul 27, 2023
Priority: 5 Day
Contact Name: Tom Duncan

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	BH07_PAVER	Jul 18, 2023		Soil	M23-Jl0044441			X	X
15	BH04_0.5-0.65	Jul 18, 2023		Soil	M23-Jl0044442			X	X
16	BH04_2.5-2.6	Jul 18, 2023		Soil	M23-Jl0044443			X	X
17	BH04_PAVER	Jul 18, 2023		Soil	M23-Jl0044444			X	X
18	FD02	Jul 18, 2023		Soil	M23-Jl0044445			X	X
19	FS02	Jul 18, 2023		Soil	M23-Jl0044446	X			
20	FD03	Jul 18, 2023		Soil	M23-Jl0044447			X	X
21	FS03	Jul 18, 2023		Soil	M23-Jl0044448	X			
22	RB01	Jul 18, 2023		Water	M23-Jl0044449				X
23	BH05_0.08-0.18	Jul 19, 2023		Soil	M23-Jl0044450			X	X
24	BH05_3.0-3.15	Jul 19, 2023		Soil	M23-Jl0044451			X	X
25	BH05_PAVER	Jul 19, 2023		Soil	M23-Jl0044452			X	X
26	BH03_0.5-0.6	Jul 19, 2023		Soil	M23-Jl0044453			X	X
27	BH03_1.5-1.7	Jul 19, 2023		Soil	M23-Jl0044454			X	X
28	BH02_0-0.1	Jul 19, 2023		Soil	M23-Jl0044455			X	X

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
29	BH02_2.7-2.8	Jul 19, 2023		Soil	M23-Jl0044456			X	X
30	FD04	Jul 19, 2023		Soil	M23-Jl0044457			X	X
31	FS04	Jul 19, 2023		Soil	M23-Jl0044458	X			
32	RB02	Jul 19, 2023		Water	M23-Jl0044459				X
33	BH08_0.37-0.45	Jul 18, 2023		Soil	M23-Jl0044460		X		
34	BH08_0.8-0.9	Jul 18, 2023		Soil	M23-Jl0044461		X		
35	BH08_2.9-3.0	Jul 18, 2023		Soil	M23-Jl0044462		X		
36	BH08_3.9-4.0	Jul 18, 2023		Soil	M23-Jl0044463		X		
37	BH08_4.9-5.0	Jul 18, 2023		Soil	M23-Jl0044464		X		
38	BH01_0.3-0.4	Jul 18, 2023		Soil	M23-Jl0044465		X		
39	BH01_0.85-0.95	Jul 18, 2023		Soil	M23-Jl0044466		X		
40	BH01_1.9-2.0	Jul 18, 2023		Soil	M23-Jl0044467		X		
41	BH01_2.25-2.35	Jul 18, 2023		Soil	M23-Jl0044468		X		
42	BH01_2.85-3.0	Jul 18, 2023		Soil	M23-Jl0044469		X		

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
43	BH01_3.9-4.0	Jul 18, 2023		Soil	M23-Jl0044470		X		
44	BH01_4.9-5.0	Jul 18, 2023		Soil	M23-Jl0044471		X		
45	BH06_0-0.1	Jul 18, 2023		Soil	M23-Jl0044472		X		
46	BH06_0.9-1.0	Jul 18, 2023		Soil	M23-Jl0044473		X		
47	BH06_1.5-1.6	Jul 18, 2023		Soil	M23-Jl0044474		X		
48	BH06_1.9-2.0	Jul 18, 2023		Soil	M23-Jl0044475		X		
49	BH06_2.4-2.5	Jul 18, 2023		Soil	M23-Jl0044476		X		
50	BH06_3.3-3.4	Jul 18, 2023		Soil	M23-Jl0044477		X		
51	BH06_4.4-4.5	Jul 18, 2023		Soil	M23-Jl0044478		X		
52	BH06_4.9-5.0	Jul 18, 2023		Soil	M23-Jl0044479		X		
53	BH07_0.25-0.35	Jul 18, 2023		Soil	M23-Jl0044480		X		
54	BH07_0.8-0.9	Jul 18, 2023		Soil	M23-Jl0044481		X		
55	BH07_1.1-1.25	Jul 18, 2023		Soil	M23-Jl0044482		X		
56	BH07_1.65-1.75	Jul 18, 2023		Soil	M23-Jl0044483		X		

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
57	BH07_2.25-2.35	Jul 18, 2023		Soil	M23-Jl0044484		X		
58	BH07_3.8-3.9	Jul 18, 2023		Soil	M23-Jl0044485		X		
59	BH07_4.9-5.0	Jul 18, 2023		Soil	M23-Jl0044486		X		
60	BH04_0.08-0.18	Jul 18, 2023		Soil	M23-Jl0044487		X		
61	BH04_0.3-0.4	Jul 18, 2023		Soil	M23-Jl0044488		X		
62	BH04_1.0-1.15	Jul 18, 2023		Soil	M23-Jl0044489		X		
63	BH04_1.55-1.65	Jul 18, 2023		Soil	M23-Jl0044490		X		
64	BH04_2.9-3.0	Jul 18, 2023		Soil	M23-Jl0044491		X		
65	BH05_0.4-0.55	Jul 19, 2023		Soil	M23-Jl0044492		X		
66	BH05_0.75-0.85	Jul 19, 2023		Soil	M23-Jl0044493		X		
67	BH05_1.25-1.35	Jul 19, 2023		Soil	M23-Jl0044494		X		
68	BH05_2.25-2.35	Jul 19, 2023		Soil	M23-Jl0044495		X		

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X	X
69	BH05_4.0-4.15	Jul 19, 2023		Soil	M23-Jl0044496		X		
70	BH05_4.9-5.0	Jul 19, 2023		Soil	M23-Jl0044497		X		
71	BH03_0-0.1	Jul 19, 2023		Soil	M23-Jl0044498		X		
72	BH03_0.3-0.4	Jul 19, 2023		Soil	M23-Jl0044499		X		
73	BH03_0.9-1.0	Jul 19, 2023		Soil	M23-Jl0044500		X		
74	BH03_2.6-2.7	Jul 19, 2023		Soil	M23-Jl0044501		X		
75	BH03_3.2-3.3	Jul 19, 2023		Soil	M23-Jl0044502		X		
76	BH03_4.2-4.3	Jul 19, 2023		Soil	M23-Jl0044503		X		
77	BH03_4.9-5.0	Jul 19, 2023		Soil	M23-Jl0044504		X		
78	BH02_0.4-0.5	Jul 19, 2023		Soil	M23-Jl0044505		X		
79	BH02_0.6-0.7	Jul 19, 2023		Soil	M23-Jl0044506		X		
80	BH02_0.8-0.9	Jul 19, 2023		Soil	M23-Jl0044507		X		
81	BH02_1.4-1.5	Jul 19, 2023		Soil	M23-Jl0044508		X		
82	BH02_1.9-2.0	Jul 19, 2023		Soil	M23-Jl0044509		X		
83	BH02_3.8-4.0	Jul 19, 2023		Soil	M23-Jl0044510		X		
Test Counts						4	51	27	29

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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)	%	96			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	88			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	96			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	91			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	97			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	96			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	80			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	95			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	103			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	127			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	105			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	82			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	99			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	91			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	90			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	109			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	95			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	105			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	95			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	83			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	97			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	80			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	83			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	110			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	89			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	90			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	84			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	86			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	103			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-JI0044439	CP	%	97			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-JI0044439	CP	%	88			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-JI0044439	CP	%	102			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-JI0044439	CP	%	96			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-JI0044439	CP	%	98			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-JI0044439	CP	%	102			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-JI0044439	CP	%	84			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-JI0044439	CP	%	99			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-JI0044439	CP	%	106			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-JI0044439	CP	%	123			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-JI0044439	CP	%	109			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-JI0044439	CP	%	85			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-JI0044439	CP	%	102			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-JI0044439	CP	%	93			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-JI0044439	CP	%	95			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-JI0044439	CP	%	115			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-JI0044439	CP	%	104			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-JI0044439	CP	%	111			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-JI0044439	CP	%	92			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-JI0044439	CP	%	86			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-JI0044439	CP	%	93			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-JI0044439	CP	%	82			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-JI0044439	CP	%	90			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-JI0044439	CP	%	126			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-JI0044439	CP	%	97			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-JI0044439	CP	%	93			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-JI0044439	CP	%	87			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-JI0044439	CP	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-JI0044439	CP	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-JI0044439	CP	%	107			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-JI0044452	CP	%	89			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-JI0044452	CP	%	81			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-JI0044452	CP	%	93			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-JI0044452	CP	%	92			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-JI0044452	CP	%	98			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-JI0044452	CP	%	97			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-JI0044452	CP	%	85			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-JI0044452	CP	%	91			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-JI0044452	CP	%	106			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-JI0044452	CP	%	119			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-JI0044452	CP	%	103			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-JI0044452	CP	%	81			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-JI0044452	CP	%	95			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-JI0044452	CP	%	90			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-JI0044452	CP	%	94			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-JI0044452	CP	%	109			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-JI0044452	CP	%	93			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-JI0044452	CP	%	104			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-JI0044452	CP	%	88			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-JI0044452	CP	%	93			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-JI0044452	CP	%	90			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-JI0044452	CP	%	73			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-JI0044452	CP	%	72			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-JI0044452	CP	%	125			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-JI0044452	CP	%	87			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-JI0044452	CP	%	103			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-JI0044452	CP	%	79			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-JI0044452	CP	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-JI0044452	CP	%	87			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-JI0044452	CP	%	99			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-JI0044432	CP	%	14	15	6.5	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-JI0044432	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-JI0044432	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-JI0044432	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-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-JI0044432	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-JI0044432	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-JI0044438	CP	%	26	20	27	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-JI0044451	CP	%	23	23	<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
Carroll Lee	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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Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1012039
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Jul 28, 2023 11:45 AM
Due: Aug 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	MW01_0-0.1	Jul 24, 2023		Soil	M23-Jl0065927		X	X
2	MW01_1.5-1.7	Jul 24, 2023		Soil	M23-Jl0065928		X	X
3	MW03_0.3-0.4	Jul 24, 2023		Soil	M23-Jl0065929		X	X
4	MW03_5.9-6.0	Jul 24, 2023		Soil	M23-Jl0065930		X	X
5	MW03_PAVER	Jul 24, 2023		Soil	M23-Jl0065931		X	X
6	MW02_0.08-0.2	Jul 24, 2023		Soil	M23-Jl0065932		X	X
7	MW02_3.9-4.0	Jul 24, 2023		Soil	M23-Jl0065933		X	X
8	MW02_PAVER	Jul 24, 2023		Soil	M23-Jl0065934		X	X
9	FD05	Jul 24, 2023		Soil	M23-Jl0065935		X	X
10	FD06	Jul 24, 2023		Soil	M23-Jl0065936		X	X
11	MW01_0.4-0.5	Jul 24, 2023		Soil	M23-Jl0065937	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 Site# 1254	NATA# 1261 Site# 25403	NATA# 1261 Site# 18217	NATA# 1261 Site# 25466	NATA# 1261 Site# 20794	Site# 25079 & 25289

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Received: Jul 28, 2023 11:45 AM
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Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
12	MW01_0.65-0.75	Jul 24, 2023		Soil	M23-Jl0065938	X		
13	MW01_0.9-1.0	Jul 24, 2023		Soil	M23-Jl0065939	X		
14	MW01_2.6-2.7	Jul 24, 2023		Soil	M23-Jl0065940	X		
15	MW01_2.9-3.0	Jul 24, 2023		Soil	M23-Jl0065941	X		
16	MW01_3.9-4.0	Jul 24, 2023		Soil	M23-Jl0065942	X		
17	MW03_0.08-0.18	Jul 24, 2023		Soil	M23-Jl0065943	X		
18	MW03_0.9-1.0	Jul 24, 2023		Soil	M23-Jl0065944	X		
19	MW03_1.4-1.5	Jul 24, 2023		Soil	M23-Jl0065945	X		
20	MW03_2.4-2.5	Jul 24, 2023		Soil	M23-Jl0065946	X		
21	MW03_3.0-3.15	Jul 24, 2023		Soil	M23-Jl0065947	X		
22	MW03_3.9-4.0	Jul 24, 2023		Soil	M23-Jl0065948	X		
23	MW03_4.9-5.0	Jul 24, 2023		Soil	M23-Jl0065949	X		
24	MW03_6.9-7.0	Jul 24, 2023		Soil	M23-Jl0065950	X		
25	MW03_7.6-7.7	Jul 24, 2023		Soil	M23-Jl0065951	X		

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

Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1012039
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Jul 28, 2023 11:45 AM
Due: Aug 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
26	MW03_8.8-9.0	Jul 24, 2023		Soil	M23-Jl0065952	X		
27	MW03_9.8-9.9	Jul 24, 2023		Soil	M23-Jl0065953	X		
28	MW03_10.9-11.0	Jul 24, 2023		Soil	M23-Jl0065954	X		
29	MW02_0.3-0.4	Jul 24, 2023		Soil	M23-Jl0065955	X		
30	MW02_0.4-0.55	Jul 24, 2023		Soil	M23-Jl0065956	X		
31	MW02_0.9-1.0	Jul 24, 2023		Soil	M23-Jl0065957	X		
32	MW02_1.8-1.9	Jul 24, 2023		Soil	M23-Jl0065958	X		
33	MW02_2.9-3.0	Jul 24, 2023		Soil	M23-Jl0065959	X		
34	MW02_4.9-5.0	Jul 24, 2023		Soil	M23-Jl0065960	X		
Test Counts						24	10	10

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Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Tom Duncan
Project name:	MFS Oakden DSI
Project ID:	12611126
Turnaround time:	5 Day
Date/Time received	Jul 28, 2023 11:45 AM
Eurofins reference	1012039

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

SAMPLE RB03 NOT RECEIVED

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.

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 **1012039-S**
Project name MFS Oakden DSI
Project ID 12611126
Received Date Jul 28, 2023

Client Sample ID			**MW01_0-0.1**	**MW01_1.5-1.7**	**MW03_0.3-0.4**	**MW03_5.9-6.0**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M23-Jl0065927**	**M23-Jl0065928**	**M23-Jl0065929**	**M23-Jl0065930**
Date Sampled			**Jul 24, 2023**	**Jul 24, 2023**	**Jul 24, 2023**	**Jul 24, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	24	25	6.5	18
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	%	84	91	94	91
13C5-PFPeA (surr.)	1	%	104	114	115	113
13C5-PFHxA (surr.)	1	%	102	111	113	110
13C4-PFHpA (surr.)	1	%	98	109	111	110
13C8-PFOA (surr.)	1	%	100	114	115	116
13C5-PFNA (surr.)	1	%	100	121	119	116
13C6-PFDA (surr.)	1	%	110	107	120	106
13C2-PFUnDA (surr.)	1	%	91	78	93	92
13C2-PFDoDA (surr.)	1	%	88	101	107	102
13C2-PFTeDA (surr.)	1	%	93	110	117	117
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	%	102	118	121	118

Client Sample ID			MW01_0-0.1	MW01_1.5-1.7	MW03_0.3-0.4	MW03_5.9-6.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0065927	M23-JI0065928	M23-JI0065929	M23-JI0065930
Date Sampled			Jul 24, 2023	Jul 24, 2023	Jul 24, 2023	Jul 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D3-N-MeFOSA (surr.)	1	%	109	123	126	127
D5-N-EtFOSA (surr.)	1	%	107	129	95	136
D7-N-MeFOSE (surr.)	1	%	85	97	101	98
D9-N-EtFOSE (surr.)	1	%	76	105	95	106
D5-N-EtFOSAA (surr.)	1	%	89	126	122	95
D3-N-MeFOSAA (surr.)	1	%	82	106	106	80
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	< 5	[N09]6.4	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]5.8	< 5	[N09]36	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	94	111	108	111
18O2-PFHxS (surr.)	1	%	95	107	107	112
13C8-PFOS (surr.)	1	%	59	73	65	66
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	%	66	62	63	58
13C2-6:2 FTSA (surr.)	1	%	60	61	67	72
13C2-8:2 FTSA (surr.)	1	%	99	107	120	108
13C2-10:2 FTSA (surr.)	1	%	71	85	99	82
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	5.8	< 5	42.4	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	5.8	< 5	36	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	5.8	< 5	42.4	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	42.4	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			MW03_PAVER	MW02_0.08-0.2	MW02_3.9-4.0	MW02_PAVER
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0065931	M23-JI0065932	M23-JI0065933	M23-JI0065934
Date Sampled			Jul 24, 2023	Jul 24, 2023	Jul 24, 2023	Jul 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	3.1	7.3	22	3.4

Client Sample ID			MW03_PAVER	MW02_0.08-0.2	MW02_3.9-4.0	MW02_PAVER
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0065931	M23-JI0065932	M23-JI0065933	M23-JI0065934
Date Sampled			Jul 24, 2023	Jul 24, 2023	Jul 24, 2023	Jul 24, 2023
Test/Reference	LOR	Unit				
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	20	< 5	< 5	14
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	90	87	92
13C5-PFPeA (surr.)	1	%	116	111	107	116
13C5-PFHxA (surr.)	1	%	114	108	105	116
13C4-PFHpA (surr.)	1	%	111	108	104	112
13C8-PFOA (surr.)	1	%	114	111	106	116
13C5-PFNA (surr.)	1	%	125	114	111	124
13C6-PFDA (surr.)	1	%	104	110	98	125
13C2-PFUnDA (surr.)	1	%	92	82	84	100
13C2-PFDoDA (surr.)	1	%	104	99	97	108
13C2-PFTeDA (surr.)	1	%	114	108	106	116
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	%	125	116	112	126
D3-N-MeFOSA (surr.)	1	%	132	128	124	132
D5-N-EtFOSA (surr.)	1	%	132	119	127	140
D7-N-MeFOSE (surr.)	1	%	107	100	95	109
D9-N-EtFOSE (surr.)	1	%	101	91	100	103
D5-N-EtFOSAA (surr.)	1	%	117	110	105	109
D3-N-MeFOSAA (surr.)	1	%	105	94	99	95
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	[N09]9.5	< 5	< 5	[N09]7.3
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	5.0	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	[N09]7.7	< 5	< 5	[N09]7.6
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]46	< 5	< 5	[N09]44
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]83	[N09]9.4	< 5	[N09]78
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	109	101	103	106

Client Sample ID			MW03_PAVER	MW02_0.08-0.2	MW02_3.9-4.0	MW02_PAVER
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0065931	M23-JI0065932	M23-JI0065933	M23-JI0065934
Date Sampled			Jul 24, 2023	Jul 24, 2023	Jul 24, 2023	Jul 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
18O2-PFHxS (surr.)	1	%	105	111	101	102
13C8-PFOS (surr.)	1	%	75	78	75	71
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	%	71	61	60	68
13C2-6:2 FTSA (surr.)	1	%	82	64	63	67
13C2-8:2 FTSA (surr.)	1	%	111	111	104	111
13C2-10:2 FTSA (surr.)	1	%	85	90	74	93
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	129	9.4	< 5	122
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	83	9.4	< 5	78
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	129	9.4	< 5	122
Sum of WA DWER PFAS (n=10)*	10	ug/kg	158.5	< 10	< 10	143.3
Sum of PFASs (n=30)*	50	ug/kg	171.2	< 50	< 50	150.9

Client Sample ID			FD05	FD06
Sample Matrix			Soil	Soil
Eurofins Sample No.			M23-JI0065935	M23-JI0065936
Date Sampled			Jul 24, 2023	Jul 24, 2023
Test/Reference	LOR	Unit		
Sample Properties				
% Moisture	1	%	3.2	6.3
Perfluoroalkyl carboxylic acids (PFCAs)				
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	9.8	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5
13C4-PFBA (surr.)	1	%	93	95
13C5-PFPeA (surr.)	1	%	119	117
13C5-PFHxA (surr.)	1	%	115	113
13C4-PFHpA (surr.)	1	%	113	113
13C8-PFOA (surr.)	1	%	124	117
13C5-PFNA (surr.)	1	%	129	121
13C6-PFDA (surr.)	1	%	102	116
13C2-PFUnDA (surr.)	1	%	96	90

Client Sample ID			FD05	FD06
Sample Matrix			Soil	Soil
Eurofins Sample No.			M23-JI0065935	M23-JI0065936
Date Sampled			Jul 24, 2023	Jul 24, 2023
Test/Reference	LOR	Unit		
Perfluoroalkyl carboxylic acids (PFCAs)				
13C2-PFDoDA (surr.)	1	%	109	105
13C2-PFTeDA (surr.)	1	%	120	111
Perfluoroalkyl sulfonamido substances				
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10
13C8-FOSA (surr.)	1	%	127	126
D3-N-MeFOSA (surr.)	1	%	133	123
D5-N-EtFOSA (surr.)	1	%	140	73
D7-N-MeFOSE (surr.)	1	%	108	105
D9-N-EtFOSE (surr.)	1	%	102	86
D5-N-EtFOSAA (surr.)	1	%	119	119
D3-N-MeFOSAA (surr.)	1	%	109	107
Perfluoroalkyl sulfonic acids (PFSAs)				
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]35	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]59	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5
13C3-PFBS (surr.)	1	%	108	108
18O2-PFHxS (surr.)	1	%	105	109
13C8-PFOS (surr.)	1	%	76	80
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	70	60
13C2-6:2 FTSA (surr.)	1	%	69	63
13C2-8:2 FTSA (surr.)	1	%	117	121
13C2-10:2 FTSA (surr.)	1	%	86	92
PFASs Summations				
Sum (PFHxS + PFOS)*	5	ug/kg	94	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	59	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	94	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	103.8	< 10
Sum of PFASs (n=30)*	50	ug/kg	103.8	< 50

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Jul 28, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Jul 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Jul 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Jul 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Jul 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Jul 28, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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

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IANZ# 1327	IANZ# 1290

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

Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1012039
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Jul 28, 2023 11:45 AM
Due: Aug 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	MW01_0-0.1	Jul 24, 2023		Soil	M23-Jl0065927		X	X
2	MW01_1.5-1.7	Jul 24, 2023		Soil	M23-Jl0065928		X	X
3	MW03_0.3-0.4	Jul 24, 2023		Soil	M23-Jl0065929		X	X
4	MW03_5.9-6.0	Jul 24, 2023		Soil	M23-Jl0065930		X	X
5	MW03_PAVER	Jul 24, 2023		Soil	M23-Jl0065931		X	X
6	MW02_0.08-0.2	Jul 24, 2023		Soil	M23-Jl0065932		X	X
7	MW02_3.9-4.0	Jul 24, 2023		Soil	M23-Jl0065933		X	X
8	MW02_PAVER	Jul 24, 2023		Soil	M23-Jl0065934		X	X
9	FD05	Jul 24, 2023		Soil	M23-Jl0065935		X	X
10	FD06	Jul 24, 2023		Soil	M23-Jl0065936		X	X
11	MW01_0.4-0.5	Jul 24, 2023		Soil	M23-Jl0065937	X		

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Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
12	MW01_0.65-0.75	Jul 24, 2023		Soil	M23-Jl0065938	X		
13	MW01_0.9-1.0	Jul 24, 2023		Soil	M23-Jl0065939	X		
14	MW01_2.6-2.7	Jul 24, 2023		Soil	M23-Jl0065940	X		
15	MW01_2.9-3.0	Jul 24, 2023		Soil	M23-Jl0065941	X		
16	MW01_3.9-4.0	Jul 24, 2023		Soil	M23-Jl0065942	X		
17	MW03_0.08-0.18	Jul 24, 2023		Soil	M23-Jl0065943	X		
18	MW03_0.9-1.0	Jul 24, 2023		Soil	M23-Jl0065944	X		
19	MW03_1.4-1.5	Jul 24, 2023		Soil	M23-Jl0065945	X		
20	MW03_2.4-2.5	Jul 24, 2023		Soil	M23-Jl0065946	X		
21	MW03_3.0-3.15	Jul 24, 2023		Soil	M23-Jl0065947	X		
22	MW03_3.9-4.0	Jul 24, 2023		Soil	M23-Jl0065948	X		
23	MW03_4.9-5.0	Jul 24, 2023		Soil	M23-Jl0065949	X		
24	MW03_6.9-7.0	Jul 24, 2023		Soil	M23-Jl0065950	X		
25	MW03_7.6-7.7	Jul 24, 2023		Soil	M23-Jl0065951	X		

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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
26	MW03_8.8-9.0	Jul 24, 2023		Soil	M23-Jl0065952	X		
27	MW03_9.8-9.9	Jul 24, 2023		Soil	M23-Jl0065953	X		
28	MW03_10.9-11.0	Jul 24, 2023		Soil	M23-Jl0065954	X		
29	MW02_0.3-0.4	Jul 24, 2023		Soil	M23-Jl0065955	X		
30	MW02_0.4-0.55	Jul 24, 2023		Soil	M23-Jl0065956	X		
31	MW02_0.9-1.0	Jul 24, 2023		Soil	M23-Jl0065957	X		
32	MW02_1.8-1.9	Jul 24, 2023		Soil	M23-Jl0065958	X		
33	MW02_2.9-3.0	Jul 24, 2023		Soil	M23-Jl0065959	X		
34	MW02_4.9-5.0	Jul 24, 2023		Soil	M23-Jl0065960	X		
Test Counts						24	10	10

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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)	%	75			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	69			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	67			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	67			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	74			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	72			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	71			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	65			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	73			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	75			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	72			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	69			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	78			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	81			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)	%	58			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	68			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	68			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	64			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	67			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	69			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	64			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	72			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	87			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	69			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	85			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	61			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	64			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	64			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	81			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-JI0065928	CP	%	82			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-JI0065928	CP	%	74			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-JI0065928	CP	%	75			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-JI0065928	CP	%	72			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-JI0065928	CP	%	81			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-JI0065928	CP	%	81			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-JI0065928	CP	%	77			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-JI0065928	CP	%	71			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-JI0065928	CP	%	79			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-JI0065928	CP	%	80			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-JI0065928	CP	%	77			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-JI0065928	CP	%	76			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-JI0065928	CP	%	88			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-JI0065928	CP	%	88			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-JI0065928	CP	%	83			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-JI0065928	CP	%	72			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-JI0065928	CP	%	74			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-JI0065928	CP	%	76			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-JI0065928	CP	%	70			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-JI0065928	CP	%	74			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-JI0065928	CP	%	75			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-JI0065928	CP	%	71			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-JI0065928	CP	%	77			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-JI0065928	CP	%	88			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-JI0065928	CP	%	72			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-JI0065928	CP	%	85			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-JI0065928	CP	%	78			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-JI0065928	CP	%	74			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-JI0065928	CP	%	71			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-JI0065928	CP	%	79			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-JI0066179	NCP	%	11	9.5	19	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-JI0065927	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-JI0065927	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-JI0065927	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-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-JI0065927	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-JI0065927	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-JI0065927	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



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

Project Name: MFS OAKDEN DSI
Project ID: 12611126

Order No.: 12611126
Report #: 1011049
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Jul 26, 2023 2:30 PM
Due: Jul 31, 2023
Priority: 3 Day
Contact Name: Terrance Wilson

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	SS10	Jul 26, 2023		Soil	M23-Jl0057357	X	X
2	SS11	Jul 26, 2023		Soil	M23-Jl0057358	X	X
3	SS12	Jul 26, 2023		Soil	M23-Jl0057359	X	X
4	SS13	Jul 26, 2023		Soil	M23-Jl0057360	X	X
5	SS14	Jul 26, 2023		Soil	M23-Jl0057361	X	X
6	SS15	Jul 26, 2023		Soil	M23-Jl0057362	X	X
7	FD07	Jul 26, 2023		Soil	M23-Jl0057363	X	X
Test Counts						7	7

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Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Terrance Wilson
Project name:	MFS OAKDEN DSI
Project ID:	12611126
Turnaround time:	3 Day
Date/Time received	Jul 26, 2023 2:30 PM
Eurofins reference	1011049

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 Terrance Wilson - Terrence.Wilson@ghd.com.

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

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: **Terrance Wilson**

Report **1011049-S**
Project name MFS OAKDEN DSI
Project ID 12611126
Received Date Jul 26, 2023

Client Sample ID			**SS10**	**SS11**	**SS12**	**SS13**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M23-JI0057357**	**M23-JI0057358**	**M23-JI0057359**	**M23-JI0057360**
Date Sampled			**Jul 26, 2023**	**Jul 26, 2023**	**Jul 26, 2023**	**Jul 26, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	21	18	18	19
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	%	90	89	95	93
13C5-PFPeA (surr.)	1	%	92	100	107	95
13C5-PFHxA (surr.)	1	%	104	106	110	119
13C4-PFHpA (surr.)	1	%	109	108	111	111
13C8-PFOA (surr.)	1	%	105	104	108	107
13C5-PFNA (surr.)	1	%	105	105	105	107
13C6-PFDA (surr.)	1	%	121	119	128	126
13C2-PFUnDA (surr.)	1	%	109	106	118	114
13C2-PFDoDA (surr.)	1	%	108	105	116	115
13C2-PFTeDA (surr.)	1	%	100	96	106	105
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	%	102	100	104	104

Client Sample ID			SS10	SS11	SS12	SS13
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-JI0057357	M23-JI0057358	M23-JI0057359	M23-JI0057360
Date Sampled			Jul 26, 2023	Jul 26, 2023	Jul 26, 2023	Jul 26, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
D3-N-MeFOSA (surr.)	1	%	120	118	121	121
D5-N-EtFOSA (surr.)	1	%	125	122	128	129
D7-N-MeFOSE (surr.)	1	%	91	90	97	91
D9-N-EtFOSE (surr.)	1	%	83	87	91	88
D5-N-EtFOSAA (surr.)	1	%	103	97	113	108
D3-N-MeFOSAA (surr.)	1	%	100	98	112	110
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	[N09]9.8	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	111	107	110	108
18O2-PFHxS (surr.)	1	%	105	106	109	108
13C8-PFOS (surr.)	1	%	100	95	101	101
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	%	109	111	107	115
13C2-6:2 FTSA (surr.)	1	%	95	92	94	93
13C2-8:2 FTSA (surr.)	1	%	130	109	115	129
13C2-10:2 FTSA (surr.)	1	%	112	110	114	116
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	9.8	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	9.8	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	9.8	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			SS14	SS15	FD07
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M23-JI0057361	M23-JI0057362	M23-JI0057363
Date Sampled			Jul 26, 2023	Jul 26, 2023	Jul 26, 2023
Test/Reference	LOR	Unit			
Sample Properties					
% Moisture	1	%	17	15	17

Client Sample ID			SS14	SS15	FD07
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M23-JI0057361	M23-JI0057362	M23-JI0057363
Date Sampled			Jul 26, 2023	Jul 26, 2023	Jul 26, 2023
Test/Reference	LOR	Unit			
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	93	96	96
13C5-PFPeA (surr.)	1	%	104	107	109
13C5-PFHxA (surr.)	1	%	108	112	114
13C4-PFHpA (surr.)	1	%	108	109	115
13C8-PFOA (surr.)	1	%	105	109	109
13C5-PFNA (surr.)	1	%	109	111	112
13C6-PFDA (surr.)	1	%	126	130	128
13C2-PFUnDA (surr.)	1	%	115	120	114
13C2-PFDoDA (surr.)	1	%	109	114	115
13C2-PFTeDA (surr.)	1	%	104	116	109
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	105	106	102
D3-N-MeFOSA (surr.)	1	%	119	128	125
D5-N-EtFOSA (surr.)	1	%	128	134	131
D7-N-MeFOSE (surr.)	1	%	92	95	97
D9-N-EtFOSE (surr.)	1	%	89	87	93
D5-N-EtFOSAA (surr.)	1	%	105	111	113
D3-N-MeFOSAA (surr.)	1	%	107	107	115
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	110	116	113

Client Sample ID			SS14	SS15	FD07
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M23-JI0057361	M23-JI0057362	M23-JI0057363
Date Sampled			Jul 26, 2023	Jul 26, 2023	Jul 26, 2023
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonic acids (PFSAs)					
18O2-PFHxS (surr.)	1	%	109	112	111
13C8-PFOS (surr.)	1	%	102	106	104
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	104	98	100
13C2-6:2 FTSA (surr.)	1	%	101	97	97
13C2-8:2 FTSA (surr.)	1	%	123	123	121
13C2-10:2 FTSA (surr.)	1	%	116	117	115
PFASs Summations					
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Jul 26, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Jul 27, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Jul 27, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Jul 27, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Jul 27, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Jul 26, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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SA 5001

Project Name: MFS OAKDEN DSI
Project ID: 12611126

Order No.: 12611126
Report #: 1011049
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Jul 26, 2023 2:30 PM
Due: Jul 31, 2023
Priority: 3 Day
Contact Name: Terrance Wilson

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	SS10	Jul 26, 2023		Soil	M23-Jl0057357	X	X
2	SS11	Jul 26, 2023		Soil	M23-Jl0057358	X	X
3	SS12	Jul 26, 2023		Soil	M23-Jl0057359	X	X
4	SS13	Jul 26, 2023		Soil	M23-Jl0057360	X	X
5	SS14	Jul 26, 2023		Soil	M23-Jl0057361	X	X
6	SS15	Jul 26, 2023		Soil	M23-Jl0057362	X	X
7	FD07	Jul 26, 2023		Soil	M23-Jl0057363	X	X
Test Counts						7	7

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Internal Quality Control Review and Glossary

General

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

Holding Times

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

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

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

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

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

Units

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

Terms

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

QC - Acceptance Criteria

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

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

Results <10 times the LOR: No Limit

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

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

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

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

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

QC Data General Comments

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

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	ug/kg	< 5			5	Pass	
Perfluoropentanoic acid (PFPeA)	ug/kg	< 5			5	Pass	
Perfluorohexanoic acid (PFHxA)	ug/kg	< 5			5	Pass	
Perfluoroheptanoic acid (PFHpA)	ug/kg	< 5			5	Pass	
Perfluorooctanoic acid (PFOA)	ug/kg	< 5			5	Pass	
Perfluorononanoic acid (PFNA)	ug/kg	< 5			5	Pass	
Perfluorodecanoic acid (PFDA)	ug/kg	< 5			5	Pass	
Perfluoroundecanoic acid (PFUnDA)	ug/kg	< 5			5	Pass	
Perfluorododecanoic acid (PFDoDA)	ug/kg	< 5			5	Pass	
Perfluorotridecanoic acid (PFTrDA)	ug/kg	< 5			5	Pass	
Perfluorotetradecanoic acid (PFTeDA)	ug/kg	< 5			5	Pass	
Method Blank							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	ug/kg	< 5			5	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	ug/kg	< 5			5	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	ug/kg	< 5			5	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	ug/kg	< 5			5	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	ug/kg	< 5			5	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	ug/kg	< 10			10	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	ug/kg	< 10			10	Pass	
Method Blank							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	ug/kg	< 5			5	Pass	
Perfluorononanesulfonic acid (PFNS)	ug/kg	< 5			5	Pass	
Perfluoropropanesulfonic acid (PFPrS)	ug/kg	< 5			5	Pass	
Perfluoropentanesulfonic acid (PFPeS)	ug/kg	< 5			5	Pass	
Perfluorohexanesulfonic acid (PFHxS)	ug/kg	< 5			5	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	ug/kg	< 5			5	Pass	
Perfluorooctanesulfonic acid (PFOS)	ug/kg	< 5			5	Pass	
Perfluorodecanesulfonic acid (PFDS)	ug/kg	< 5			5	Pass	
Method Blank							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	ug/kg	< 10			10	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	ug/kg	< 5			5	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	ug/kg	< 5			5	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	95			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	90			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	103			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	95			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	99			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	103			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	99			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	105			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	99			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	76			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	100			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	91			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	96			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	98			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	101			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	94			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	101			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	100			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	86			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	93			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	81			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	79			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	89			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	101			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	93			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	95			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	94			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	109			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	87			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-JI0055845	NCP	%	100			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-JI0055845	NCP	%	91			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-JI0055845	NCP	%	108			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-JI0055845	NCP	%	103			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-JI0055845	NCP	%	105			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-JI0055845	NCP	%	106			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-JI0055845	NCP	%	107			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-JI0055845	NCP	%	110			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-JI0055845	NCP	%	102			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-JI0055845	NCP	%	93			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-JI0055845	NCP	%	103			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-JI0055845	NCP	%	95			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-JI0055845	NCP	%	100			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-JI0055845	NCP	%	102			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-JI0055845	NCP	%	110			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-JI0055845	NCP	%	97			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-JI0055845	NCP	%	104			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-JI0055845	NCP	%	101			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-JI0055845	NCP	%	89			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-JI0055845	NCP	%	101			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-JI0055845	NCP	%	85			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-JI0055845	NCP	%	81			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-JI0055845	NCP	%	96			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-JI0055845	NCP	%	108			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-JI0055845	NCP	%	107			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-JI0055845	NCP	%	100			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-JI0055845	NCP	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-JI0055845	NCP	%	111			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-JI0055845	NCP	%	108			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-JI0055845	NCP	%	96			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-JI0058226	NCP	%	13	13	3.1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-JI0055521	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-JI0055521	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-JI0055521	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-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-JI0055521	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-JI0055521	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-JI0055521	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:

Amy Meunier	Analytical Services Manager
Edward Lee	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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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

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

Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1013609
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Aug 3, 2023 12:25 PM
Due: Aug 10, 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	BH01_0.85-0.95	Jul 18, 2023		Soil	M23-Au0008702	X	X
2	BH01_2.25-2.35	Jul 18, 2023		Soil	M23-Au0008703	X	X
3	BH02_1.4-1.5	Jul 19, 2023		Soil	M23-Au0008704	X	X
4	BH03_3.2-3.3	Jul 19, 2023		Soil	M23-Au0008705	X	X
5	BH03_4.9-5.0	Jul 19, 2023		Soil	M23-Au0008706	X	X
6	BH04_2.9-3.0	Jul 18, 2023		Soil	M23-Au0008707	X	X
7	BH06_4.4-4.5	Jul 18, 2023		Soil	M23-Au0008708	X	X
8	BH08_2.9-3.0	Jul 18, 2023		Soil	M23-Au0008709	X	X
9	BH08_4.9-5.0	Jul 18, 2023		Soil	M23-Au0008710	X	X
Test Counts						9	9

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Eurofins Environment Testing Australia Pty Ltd

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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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Site# 2370

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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

Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Ally Kirkman
Project name:	MFS Oakden DSI
Project ID:	12611126
Turnaround time:	5 Day
Date/Time received	Aug 3, 2023 12:25 PM
Eurofins reference	1013609

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.

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 **1013609-S-V2**
Project name MFS Oakden DSI
Project ID 12611126
Received Date Aug 03, 2023

Client Sample ID			**BH01_0.85-0.95**	**BH01_2.25-2.35**	**BH02_1.4-1.5**	**BH03_3.2-3.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M23-Au0008702**	**M23-Au0008703**	**M23-Au0008704**	**M23-Au0008705**
Date Sampled			**Jul 18, 2023**	**Jul 18, 2023**	**Jul 19, 2023**	**Jul 19, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	16	22	23	24
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	%	86	86	83	87
13C5-PFPeA (surr.)	1	%	104	106	99	103
13C5-PFHxA (surr.)	1	%	105	111	97	104
13C4-PFHpA (surr.)	1	%	103	100	97	105
13C8-PFOA (surr.)	1	%	102	111	110	116
13C5-PFNA (surr.)	1	%	76	59	69	96
13C6-PFDA (surr.)	1	%	121	116	115	118
13C2-PFUnDA (surr.)	1	%	77	82	90	96
13C2-PFDoDA (surr.)	1	%	98	106	105	108
13C2-PFTeDA (surr.)	1	%	92	91	86	85
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_0.85-0.95	BH01_2.25-2.35	BH02_1.4-1.5	BH03_3.2-3.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0008702	M23-Au0008703	M23-Au0008704	M23-Au0008705
Date Sampled			Jul 18, 2023	Jul 18, 2023	Jul 19, 2023	Jul 19, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	108	99	106	111
D3-N-MeFOSA (surr.)	1	%	81	87	75	87
D5-N-EtFOSA (surr.)	1	%	120	113	108	120
D7-N-MeFOSE (surr.)	1	%	91	82	74	92
D9-N-EtFOSE (surr.)	1	%	97	99	90	104
D5-N-EtFOSAA (surr.)	1	%	115	116	122	125
D3-N-MeFOSAA (surr.)	1	%	84	106	89	116
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	< 5	< 5	14
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	100	102	93	108
18O2-PFHxS (surr.)	1	%	73	62	76	87
13C8-PFOS (surr.)	1	%	94	98	89	101
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	%	87	94	76	83
13C2-6:2 FTSA (surr.)	1	%	109	138	93	134
13C2-8:2 FTSA (surr.)	1	%	118	105	111	83
13C2-10:2 FTSA (surr.)	1	%	114	120	95	121
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	14
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	14
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	14
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH03_4.9-5.0	BH04_2.9-3.0	BH06_4.4-4.5	BH08_2.9-3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0008706	M23-Au0008707	M23-Au0008708	M23-Au0008709
Date Sampled			Jul 19, 2023	Jul 18, 2023	Jul 18, 2023	Jul 18, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	23	26	21	21
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	%	96	94	90	90
13C5-PFPeA (surr.)	1	%	116	115	111	106
13C5-PFHxA (surr.)	1	%	118	117	108	105
13C4-PFHpA (surr.)	1	%	110	108	105	106
13C8-PFOA (surr.)	1	%	127	127	116	118
13C5-PFNA (surr.)	1	%	93	89	89	87
13C6-PFDA (surr.)	1	%	121	133	118	122
13C2-PFUnDA (surr.)	1	%	115	118	113	119
13C2-PFDoDA (surr.)	1	%	115	118	104	116
13C2-PFTeDA (surr.)	1	%	96	91	98	87
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	%	115	128	105	101
D3-N-MeFOSA (surr.)	1	%	91	90	94	91
D5-N-EtFOSA (surr.)	1	%	122	127	124	122
D7-N-MeFOSE (surr.)	1	%	115	100	81	98
D9-N-EtFOSE (surr.)	1	%	102	105	104	99
D5-N-EtFOSAA (surr.)	1	%	125	114	100	111
D3-N-MeFOSAA (surr.)	1	%	112	102	78	105
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	9.5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			BH03_4.9-5.0	BH04_2.9-3.0	BH06_4.4-4.5	BH08_2.9-3.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0008706	M23-Au0008707	M23-Au0008708	M23-Au0008709
Date Sampled			Jul 19, 2023	Jul 18, 2023	Jul 18, 2023	Jul 18, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	117	110	108	104
18O2-PFHxS (surr.)	1	%	108	101	100	104
13C8-PFOS (surr.)	1	%	109	102	100	102
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	%	97	87	98	97
13C2-6:2 FTSA (surr.)	1	%	114	127	103	127
13C2-8:2 FTSA (surr.)	1	%	111	127	114	112
13C2-10:2 FTSA (surr.)	1	%	114	109	85	114
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	9.5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	9.5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH08_4.9-5.0
Sample Matrix			Soil
Eurofins Sample No.			M23-Au0008710
Date Sampled			Jul 18, 2023
Test/Reference	LOR	Unit	
Sample Properties			
% Moisture	1	%	21
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	%	90
13C5-PFPeA (surr.)	1	%	108
13C5-PFHxA (surr.)	1	%	115
13C4-PFHpA (surr.)	1	%	100

Client Sample ID			BH08_4.9-5.0
Sample Matrix			Soil
Eurofins Sample No.			M23-Au0008710
Date Sampled			Jul 18, 2023
Test/Reference	LOR	Unit	
Perfluoroalkyl carboxylic acids (PFCAs)			
13C8-PFOA (surr.)	1	%	116
13C5-PFNA (surr.)	1	%	77
13C6-PFDA (surr.)	1	%	123
13C2-PFUnDA (surr.)	1	%	121
13C2-PFDoDA (surr.)	1	%	110
13C2-PFTeDA (surr.)	1	%	92
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
13C8-FOSA (surr.)	1	%	107
D3-N-MeFOSA (surr.)	1	%	92
D5-N-EtFOSA (surr.)	1	%	121
D7-N-MeFOSE (surr.)	1	%	94
D9-N-EtFOSE (surr.)	1	%	101
D5-N-EtFOSAA (surr.)	1	%	103
D3-N-MeFOSAA (surr.)	1	%	104
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5
13C3-PFBS (surr.)	1	%	108
18O2-PFHxS (surr.)	1	%	102
13C8-PFOS (surr.)	1	%	99
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	%	93
13C2-6:2 FTSA (surr.)	1	%	123
13C2-8:2 FTSA (surr.)	1	%	130
13C2-10:2 FTSA (surr.)	1	%	114

Client Sample ID			BH08_4.9-5.0
Sample Matrix			Soil
Eurofins Sample No.			M23-Au0008710
Date Sampled			Jul 18, 2023
Test/Reference	LOR	Unit	
PFASs Summations			
Sum (PFHxS + PFOS)*	5	ug/kg	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Aug 03, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Aug 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Aug 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Aug 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Aug 03, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Aug 03, 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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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 Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1013609
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Aug 3, 2023 12:25 PM
Due: Aug 10, 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	BH01_0.85-0.95	Jul 18, 2023		Soil	M23-Au0008702	X	X
2	BH01_2.25-2.35	Jul 18, 2023		Soil	M23-Au0008703	X	X
3	BH02_1.4-1.5	Jul 19, 2023		Soil	M23-Au0008704	X	X
4	BH03_3.2-3.3	Jul 19, 2023		Soil	M23-Au0008705	X	X
5	BH03_4.9-5.0	Jul 19, 2023		Soil	M23-Au0008706	X	X
6	BH04_2.9-3.0	Jul 18, 2023		Soil	M23-Au0008707	X	X
7	BH06_4.4-4.5	Jul 18, 2023		Soil	M23-Au0008708	X	X
8	BH08_2.9-3.0	Jul 18, 2023		Soil	M23-Au0008709	X	X
9	BH08_4.9-5.0	Jul 18, 2023		Soil	M23-Au0008710	X	X
Test Counts						9	9

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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)	%	70			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	65			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	66			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	67			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	65			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	62			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	69			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	65			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	65			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	80			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	77			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	66			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	67			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	82			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	84			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	75			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	81			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	77			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	67			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	77			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	68			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	112			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	67			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	54			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	70			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	62			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	64			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	80			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	85			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	73			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-Au0008705	CP	%	77			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Au0008705	CP	%	72			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Au0008705	CP	%	75			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Au0008705	CP	%	71			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Au0008705	CP	%	69			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Au0008705	CP	%	71			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Au0008705	CP	%	73			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Au0008705	CP	%	78			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Au0008705	CP	%	74			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Au0008705	CP	%	86			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0008705	CP	%	82			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Au0008705	CP	%	78			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0008705	CP	%	71			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0008705	CP	%	92			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Au0008705	CP	%	135			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0008705	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-Au0008705	CP	%	85			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0008705	CP	%	79			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Au0008705	CP	%	76			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Au0008705	CP	%	86			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0008705	CP	%	70			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Au0008705	CP	%	145			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0008705	CP	%	69			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0008705	CP	%	76			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Au0008705	CP	%	86			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Au0008705	CP	%	80			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-Au0008705	CP	%	84			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0008705	CP	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0008705	CP	%	75			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0008705	CP	%	80			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-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Au0008704	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0008704	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Au0008704	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-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0008704	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0008704	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-Au0008710	CP	%	21	21	1.6	30%	Pass	

Comments

This report has been revised (V2) to correct sample date from 18/07/23 to 19/07/23 for samples Au0008704 to 8706.

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:

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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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 Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1020822
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Aug 28, 2023 1:46 PM
Due: Sep 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH14_0.4-0.5	Aug 23, 2023		Soil	M23-Au0070998		X	X
2	BH15_0.4-0.5	Aug 23, 2023		Soil	M23-Au0070999		X	X
3	BH16_0.1-0.2	Aug 23, 2023		Soil	M23-Au0071000		X	X
4	BH16_0.4-0.6	Aug 23, 2023		Soil	M23-Au0071001		X	X
5	BH17_0.25-0.42	Aug 23, 2023		Soil	M23-Au0071002		X	X
6	BH18_0.9-1.0	Aug 23, 2023		Soil	M23-Au0071003		X	X
7	BH09_0.9-1.0	Aug 23, 2023		Soil	M23-Au0071004		X	X
8	BH10_0.4-0.5	Aug 23, 2023		Soil	M23-Au0071005		X	X
9	BH11_0.9-1.0	Aug 23, 2023		Soil	M23-Au0071006		X	X
10	BH12_0.6-0.7	Aug 24, 2023		Soil	M23-Au0071007		X	X
11	BH13_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071008		X	X
12	BH19_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071009		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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Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1020822
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Aug 28, 2023 1:46 PM
Due: Sep 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
13	BH19_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071010		X	X
14	BH20_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071011		X	X
15	BH20_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071012		X	X
16	BH21_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071013		X	X
17	BH21_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071014		X	X
18	BH22_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071015		X	X
19	BH22_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071016		X	X
20	BH23_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071017		X	X
21	BH23_0.2-0.32	Aug 24, 2023		Soil	M23-Au0071018		X	X
22	BH24_0.5-0.6	Aug 24, 2023		Soil	M23-Au0071019		X	X
23	BH25_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071020		X	X
24	BH26_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071021		X	X
25	BH27_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071022		X	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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Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
26	BH27_0.4-0.45	Aug 24, 2023		Soil	M23-Au0071023		X	X
27	BH28_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071024		X	X
28	BH28_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071025		X	X
29	BH29_0.01-0.06	Aug 24, 2023		Soil	M23-Au0071026		X	X
30	BH29_0.25-0.3	Aug 24, 2023		Soil	M23-Au0071027		X	X
31	BH30_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071028		X	X
32	BH30_0.25-0.3	Aug 24, 2023		Soil	M23-Au0071029		X	X
33	BH31_0.25-0.35	Aug 24, 2023		Soil	M23-Au0071030		X	X
34	BH31_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071031		X	X
35	BH32_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071032		X	X
36	BH32_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071033		X	X
37	BH33_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071034		X	X

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
38	BH34_0.01-0.05	Aug 25, 2023		Soil	M23-Au0071035		X	X
39	BH34_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071036		X	X
40	BH35_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071037		X	X
41	BH36_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071038		X	X
42	BH36_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071039		X	X
43	BH37_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071040		X	X
44	BH37_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071041		X	X
45	BH38_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071042		X	X
46	BH38-0.4-0.5	Aug 25, 2023		Soil	M23-Au0071043		X	X
47	BH39_0.0-0.05	Aug 25, 2023		Soil	M23-Au0071044		X	X
48	BH39_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071045		X	X
49	BH40_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071046		X	X
50	BH40_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071047		X	X
51	BH41_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071048		X	X
52	BH41_0.9-1.0	Aug 25, 2023		Soil	M23-Au0071049		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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NATA# 2377
Site# 2370

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NZBN: 9429046024954

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IANZ# 1327	IANZ# 1290	IANZ# 1402

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

Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1020822
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Aug 28, 2023 1:46 PM
Due: Sep 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
53	BH42_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071050		X	X
54	BH42_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071051		X	X
55	BH43_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071052		X	X
56	BH43_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071053		X	X
57	BH44_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071054		X	X
58	BH44_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071055		X	X
59	BH45_0.0-0.05	Aug 25, 2023		Soil	M23-Au0071056		X	X
60	BH45_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071057		X	X
61	BH46_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071058		X	X
62	BH46_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071059		X	X
63	BH47_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071060		X	X
64	BH47_0.45-0.5	Aug 25, 2023		Soil	M23-Au0071061		X	X
65	SED01	Aug 24, 2023		Soil	M23-Au0071062		X	X
66	SED02	Aug 24, 2023		Soil	M23-Au0071063		X	X
67	SED03	Aug 24, 2023		Soil	M23-Au0071064		X	X
68	FD01	Aug 23, 2023		Soil	M23-Au0071065		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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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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Received: Aug 28, 2023 1:46 PM
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Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
69	FD02	Aug 24, 2023		Soil	M23-Au0071066		X	X
70	FD03	Aug 24, 2023		Soil	M23-Au0071067		X	X
71	FD04	Aug 24, 2023		Soil	M23-Au0071068		X	X
72	FD05	Aug 24, 2023		Soil	M23-Au0071069		X	X
73	FD06	Aug 25, 2023		Soil	M23-Au0071070		X	X
74	FD07	Aug 25, 2023		Soil	M23-Au0071071		X	X
75	FD08	Aug 25, 2023		Soil	M23-Au0071072		X	X
76	RB01A	Aug 23, 2023		Water	M23-Au0071073			X
77	RB01B	Aug 23, 2023		Water	M23-Au0071074			X
78	RB02A	Aug 24, 2023		Water	M23-Au0071075			X
79	RB03A	Aug 25, 2023		Water	M23-Au0071076			X
80	BH14_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071077	X		
81	BH14_0.1-0.15	Aug 23, 2023		Soil	M23-Au0071078	X		
82	BH14_0.2-0.3	Aug 23, 2023		Soil	M23-Au0071079	X		
83	BH15_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071080	X		
84	BH15_0.1-0.2	Aug 23, 2023		Soil	M23-Au0071081	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						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
85	BH15_0.2-0.4	Aug 23, 2023		Soil	M23-Au0071082	X		
86	BH16_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071083	X		
87	BH17_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071084	X		
88	BH17_0.1-0.25	Aug 23, 2023		Soil	M23-Au0071085	X		
89	BH18_0.01-0.15	Aug 23, 2023		Soil	M23-Au0071086	X		
90	BH18_0.15-0.25	Aug 23, 2023		Soil	M23-Au0071087	X		
91	BH18_0.25-0.35	Aug 23, 2023		Soil	M23-Au0071088	X		
92	BH09_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071089	X		
93	BH09_0.2-0.3	Aug 23, 2023		Soil	M23-Au0071090	X		
94	BH09_0.4-0.5	Aug 23, 2023		Soil	M23-Au0071091	X		
95	BH10_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071092	X		
96	BH10_0.2-0.3	Aug 23, 2023		Soil	M23-Au0071093	X		
97	BH11_0.0-0.1	Aug 23, 2023		Soil	M23-Au0071094	X		
98	BH11_0.25-	Aug 23, 2023		Soil	M23-Au0071095	X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
	0.35							
99	BH12_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071096	X		
100	BH12_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071097	X		
101	BH13_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071098	X		
102	BH13_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071100	X		
103	BH19_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071101	X		
104	BH20_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071102	X		
105	BH21_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071103	X		
106	BH22_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071104	X		
107	BH23_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071105	X		
108	BH24_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071106	X		
109	BH24_0.25-0.35	Aug 24, 2023		Soil	M23-Au0071107	X		
110	BH25_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071108	X		
111	BH25_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071109	X		

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NATA# 1261
Site# 18217

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Site# 25466

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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
112	BH26_0.01-0.06	Aug 24, 2023		Soil	M23-Au0071110	X		
113	BH26_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071111	X		
114	BH27_0.3-0.4	Aug 24, 2023		Soil	M23-Au0071112	X		
115	BH29_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071113	X		
116	BH30_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071114	X		
117	BH31_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071115	X		
118	BH32_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071116	X		
119	BH33_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071117	X		
120	BH33_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071118	X		
121	BH34_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071119	X		
122	BH35_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071120	X		
123	BH36_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071121	X		
124	BH37_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071122	X		
125	BH38_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071123	X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
126	BH39_0.05-0.1	Aug 25, 2023		Soil	M23-Au0071124	X		
127	BH39_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071125	X		
128	BH40_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071126	X		
129	BH41_0.45-0.55	Aug 25, 2023		Soil	M23-Au0071127	X		
130	BH42_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071128	X		
131	BH43_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071129	X		
132	BH44_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071130	X		
133	BH45_0.1-0.15	Aug 25, 2023		Soil	M23-Au0071131	X		
134	BH45_0.2-0.24	Aug 25, 2023		Soil	M23-Au0071132	X		
135	BH46_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071133	X		
136	BH47_0.15-0.25	Aug 25, 2023		Soil	M23-Au0071134	X		
137	BH47_0.35-0.45	Aug 25, 2023		Soil	M23-Au0071135	X		
Test Counts						58	75	79

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Tom Duncan
Project name:	MFS Oakden DSI
Project ID:	12611126
Turnaround time:	5 Day
Date/Time received	Aug 28, 2023 1:46 PM
Eurofins reference	1020822

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

BH30_0.1-0.2 received instead of BH30_0.05-0.15

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.

GHD Pty Ltd
GPO Box 2052
Adelaide
SA 5001

Attention: **Tom Duncan**

Report **1020822-S**
Project name MFS Oakden DSI
Project ID 12611126
Received Date Aug 28, 2023

Client Sample ID			BH14_0.4-0.5	BH15_0.4-0.5	BH16_0.1-0.2	BH16_0.4-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0070998	M23-Au0070999	M23-Au0071000	M23-Au0071001
Date Sampled			Aug 23, 2023	Aug 23, 2023	Aug 23, 2023	Aug 23, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	18	19	23	19
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	%	105	112	110	110
13C5-PFPeA (surr.)	1	%	123	131	130	125
13C5-PFHxA (surr.)	1	%	113	124	116	119
13C4-PFHpA (surr.)	1	%	105	117	108	131
13C8-PFOA (surr.)	1	%	121	124	124	127
13C5-PFNA (surr.)	1	%	132	139	137	132
13C6-PFDA (surr.)	1	%	108	114	114	114
13C2-PFUnDA (surr.)	1	%	109	112	105	115
13C2-PFDoDA (surr.)	1	%	121	128	122	126
13C2-PFTeDA (surr.)	1	%	143	139	122	126
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			BH14_0.4-0.5	BH15_0.4-0.5	BH16_0.1-0.2	BH16_0.4-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0070998	M23-Au0070999	M23-Au0071000	M23-Au0071001
Date Sampled			Aug 23, 2023	Aug 23, 2023	Aug 23, 2023	Aug 23, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	121	122	123	120
D3-N-MeFOSA (surr.)	1	%	117	124	122	114
D5-N-EtFOSA (surr.)	1	%	131	131	129	129
D7-N-MeFOSE (surr.)	1	%	116	128	114	113
D9-N-EtFOSE (surr.)	1	%	119	129	124	124
D5-N-EtFOSAA (surr.)	1	%	138	144	128	142
D3-N-MeFOSAA (surr.)	1	%	123	120	115	123
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	132	134	136	128
18O2-PFHxS (surr.)	1	%	124	121	130	121
13C8-PFOS (surr.)	1	%	124	124	126	121
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	%	107	112	108	107
13C2-6:2 FTSA (surr.)	1	%	120	119	109	119
13C2-8:2 FTSA (surr.)	1	%	134	135	131	130
13C2-10:2 FTSA (surr.)	1	%	119	133	127	131
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

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Client Sample ID			BH17_0.25-0.42	BH18_0.9-1.0	BH09_0.9-1.0	BH10_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071002	M23-Au0071003	M23-Au0071004	M23-Au0071005
Date Sampled			Aug 23, 2023	Aug 23, 2023	Aug 23, 2023	Aug 23, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	22	15	22	24
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	%	107	55	104	46
13C5-PFPeA (surr.)	1	%	128	64	126	51
13C5-PFHxA (surr.)	1	%	130	57	115	49
13C4-PFHpA (surr.)	1	%	108	52	111	46
13C8-PFOA (surr.)	1	%	125	53	125	51
13C5-PFNA (surr.)	1	%	129	69	124	55
13C6-PFDA (surr.)	1	%	108	49	105	48
13C2-PFUnDA (surr.)	1	%	109	52	105	49
13C2-PFDoDA (surr.)	1	%	121	59	123	50
13C2-PFTeDA (surr.)	1	%	124	48	127	37
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	%	118	62	120	54
D3-N-MeFOSA (surr.)	1	%	115	58	117	48
D5-N-EtFOSA (surr.)	1	%	129	63	132	54
D7-N-MeFOSE (surr.)	1	%	112	59	116	50
D9-N-EtFOSE (surr.)	1	%	123	58	126	47
D5-N-EtFOSAA (surr.)	1	%	142	58	147	59
D3-N-MeFOSAA (surr.)	1	%	121	56	119	51
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

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Client Sample ID			BH17_0.25-0.42	BH18_0.9-1.0	BH09_0.9-1.0	BH10_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071002	M23-Au0071003	M23-Au0071004	M23-Au0071005
Date Sampled			Aug 23, 2023	Aug 23, 2023	Aug 23, 2023	Aug 23, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	131	66	131	57
18O2-PFHxS (surr.)	1	%	120	60	121	52
13C8-PFOS (surr.)	1	%	125	64	118	54
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	%	109	55	106	47
13C2-6:2 FTSA (surr.)	1	%	119	63	135	50
13C2-8:2 FTSA (surr.)	1	%	118	69	121	51
13C2-10:2 FTSA (surr.)	1	%	127	60	127	49
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH11_0.9-1.0	BH12_0.6-0.7	BH13_0.4-0.5	BH19_0.01-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071006	M23-Au0071007	M23-Au0071008	M23-Au0071009
Date Sampled			Aug 23, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	22	16	11	16
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	< 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	%	64	112	105	109
13C5-PFPeA (surr.)	1	%	73	133	128	121
13C5-PFHxA (surr.)	1	%	68	137	118	106

Client Sample ID			BH11_0.9-1.0	BH12_0.6-0.7	BH13_0.4-0.5	BH19_0.01-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071006	M23-Au0071007	M23-Au0071008	M23-Au0071009
Date Sampled			Aug 23, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C4-PFHpA (surr.)	1	%	64	121	108	114
13C8-PFOA (surr.)	1	%	71	133	121	126
13C5-PFNA (surr.)	1	%	88	143	128	134
13C6-PFDA (surr.)	1	%	64	123	116	115
13C2-PFUnDA (surr.)	1	%	58	110	98	107
13C2-PFDoDA (surr.)	1	%	65	134	121	124
13C2-PFTeDA (surr.)	1	%	34	112	109	112
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	%	69	137	124	125
D3-N-MeFOSA (surr.)	1	%	68	128	117	121
D5-N-EtFOSA (surr.)	1	%	68	146	127	131
D7-N-MeFOSE (surr.)	1	%	64	132	115	118
D9-N-EtFOSE (surr.)	1	%	58	138	123	120
D5-N-EtFOSAA (surr.)	1	%	83	138	126	136
D3-N-MeFOSAA (surr.)	1	%	73	123	110	112
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	[N09]8.6	< 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	[N09]37	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	6.1	[N09]14	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	78	142	127	130
18O2-PFHxS (surr.)	1	%	73	126	116	120
13C8-PFOS (surr.)	1	%	71	134	124	111
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	%	66	115	106	112
13C2-6:2 FTSA (surr.)	1	%	74	125	121	127
13C2-8:2 FTSA (surr.)	1	%	74	144	138	126
13C2-10:2 FTSA (surr.)	1	%	72	130	121	122

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Client Sample ID			BH11_0.9-1.0	BH12_0.6-0.7	BH13_0.4-0.5	BH19_0.01-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071006	M23-Au0071007	M23-Au0071008	M23-Au0071009
Date Sampled			Aug 23, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	6.1	51	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	6.1	14	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	6.1	51	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	65.1	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	65.1	< 50	< 50

Client Sample ID			BH19_0.4-0.5	BH20_0.01-0.1	BH20_0.4-0.5	BH21_0.01-0.11
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071010	M23-Au0071011	M23-Au0071012	M23-Au0071013
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	18	17	17	16
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg		< 5		< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg		< 5		< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg		< 5		< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg		< 5		< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg		< 5		< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg		< 5		< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg		< 5		< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg		< 5		< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg		< 5		< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg		< 5		< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg		< 5		< 5
13C4-PFBA (surr.)	1	%		89		107
13C5-PFPeA (surr.)	1	%		131		119
13C5-PFHxA (surr.)	1	%		114		115
13C4-PFHpA (surr.)	1	%		115		114
13C8-PFOA (surr.)	1	%		130		122
13C5-PFNA (surr.)	1	%		132		133
13C6-PFDA (surr.)	1	%		133		115
13C2-PFUnDA (surr.)	1	%		111		111
13C2-PFDoDA (surr.)	1	%		124		126
13C2-PFTeDA (surr.)	1	%		122		124
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg		< 5		< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg		< 5		< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg		< 5		< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg		< 5		< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg		< 5		< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg		< 10		< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg		< 10		< 10

Client Sample ID			BH19_0.4-0.5	BH20_0.01-0.1	BH20_0.4-0.5	BH21_0.01-0.11
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071010	M23-Au0071011	M23-Au0071012	M23-Au0071013
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%		130		123
D3-N-MeFOSA (surr.)	1	%		121		123
D5-N-EtFOSA (surr.)	1	%		134		133
D7-N-MeFOSE (surr.)	1	%		123		108
D9-N-EtFOSE (surr.)	1	%		127		113
D5-N-EtFOSAA (surr.)	1	%		134		129
D3-N-MeFOSAA (surr.)	1	%		124		115
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg		< 5		< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg		< 5		< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg		< 5		< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg		< 5		< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg		< 5		< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg		< 5		< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg		< 5		< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg		< 5		< 5
13C3-PFBS (surr.)	1	%		133		153
18O2-PFHxS (surr.)	1	%		127		119
13C8-PFOS (surr.)	1	%		130		127
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg		< 5		< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg		< 10		< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg		< 5		< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg		< 5		< 5
13C2-4:2 FTSA (surr.)	1	%		133		119
13C2-6:2 FTSA (surr.)	1	%		141		126
13C2-8:2 FTSA (surr.)	1	%		138		136
13C2-10:2 FTSA (surr.)	1	%		129		119
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	-	< 5	-	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	-	< 5	-	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	-	< 5	-	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	-	< 10	-	< 10
Sum of PFASs (n=30)*	50	ug/kg	-	< 50	-	< 50

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Client Sample ID			BH21_0.4-0.5	BH22_0.01-0.11	BH22_0.4-0.5	BH23_0.01-0.11
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071014	M23-Au0071015	M23-Au0071016	M23-Au0071017
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	16	17	18	18
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg		< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg		< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg		< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg		< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg		< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg		< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg		< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg		< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg		< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg		< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg		< 5	< 5	< 5
13C4-PFBA (surr.)	1	%		100	105	107
13C5-PFPeA (surr.)	1	%		113	116	118
13C5-PFHxA (surr.)	1	%		131	134	109
13C4-PFHpA (surr.)	1	%		107	108	110
13C8-PFOA (surr.)	1	%		115	118	113
13C5-PFNA (surr.)	1	%		127	133	134
13C6-PFDA (surr.)	1	%		116	115	113
13C2-PFUnDA (surr.)	1	%		102	101	110
13C2-PFDoDA (surr.)	1	%		134	129	113
13C2-PFTeDA (surr.)	1	%		91	93	124
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg		< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg		< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg		< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg		< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg		< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg		< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg		< 10	< 10	< 10
13C8-FOSA (surr.)	1	%		102	104	121
D3-N-MeFOSA (surr.)	1	%		114	111	117
D5-N-EtFOSA (surr.)	1	%		121	120	124
D7-N-MeFOSE (surr.)	1	%		109	110	107
D9-N-EtFOSE (surr.)	1	%		98	102	116
D5-N-EtFOSAA (surr.)	1	%		117	128	136
D3-N-MeFOSAA (surr.)	1	%		123	121	116
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg		< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg		< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg		< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg		< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg		< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg		< 5	< 5	< 5

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Client Sample ID			BH21_0.4-0.5	BH22_0.01-0.11	BH22_0.4-0.5	BH23_0.01-0.11
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071014	M23-Au0071015	M23-Au0071016	M23-Au0071017
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg		< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg		< 5	< 5	< 5
13C3-PFBS (surr.)	1	%		123	121	132
18O2-PFHxS (surr.)	1	%		106	107	122
13C8-PFOS (surr.)	1	%		116	120	121
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg		< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg		< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg		< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg		< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%		73	75	110
13C2-6:2 FTSA (surr.)	1	%		80	81	126
13C2-8:2 FTSA (surr.)	1	%		120	129	133
13C2-10:2 FTSA (surr.)	1	%		129	132	120
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	-	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	-	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	-	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	-	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	-	< 50	< 50	< 50

Client Sample ID			BH23_0.2-0.32	BH24_0.5-0.6	BH25_0.4-0.5	BH26_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071018	M23-Au0071019	M23-Au0071020	M23-Au0071021
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	25	18	24	24
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	%	62	54	89	98
13C5-PFPeA (surr.)	1	%	66	60	94	106
13C5-PFHxA (surr.)	1	%	80	75	106	123

Client Sample ID			BH23_0.2-0.32	BH24_0.5-0.6	BH25_0.4-0.5	BH26_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071018	M23-Au0071019	M23-Au0071020	M23-Au0071021
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C4-PFHpA (surr.)	1	%	62	59	91	97
13C8-PFOA (surr.)	1	%	67	61	97	114
13C5-PFNA (surr.)	1	%	76	64	100	113
13C6-PFDA (surr.)	1	%	78	59	95	101
13C2-PFUnDA (surr.)	1	%	65	52	93	102
13C2-PFDoDA (surr.)	1	%	73	62	98	102
13C2-PFTeDA (surr.)	1	%	37	25	45	47
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	%	62	53	88	94
D3-N-MeFOSA (surr.)	1	%	67	56	96	99
D5-N-EtFOSA (surr.)	1	%	61	50	90	97
D7-N-MeFOSE (surr.)	1	%	61	55	90	97
D9-N-EtFOSE (surr.)	1	%	53	42	70	76
D5-N-EtFOSAA (surr.)	1	%	67	60	115	129
D3-N-MeFOSAA (surr.)	1	%	69	60	107	123
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	[N09]220
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	80	70	101	117
18O2-PFHxS (surr.)	1	%	67	51	96	105
13C8-PFOS (surr.)	1	%	75	61	103	103
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	%	45	38	65	75
13C2-6:2 FTSA (surr.)	1	%	44	37	69	83
13C2-8:2 FTSA (surr.)	1	%	77	59	99	110
13C2-10:2 FTSA (surr.)	1	%	70	53	109	115

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Client Sample ID			BH23_0.2-0.32	BH24_0.5-0.6	BH25_0.4-0.5	BH26_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071018	M23-Au0071019	M23-Au0071020	M23-Au0071021
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	220
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	220
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	220
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	220
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	220

Client Sample ID			BH27_0.01-0.11	BH27_0.4-0.45	BH28_0.01-0.11	BH28_0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071022	M23-Au0071023	M23-Au0071024	M23-Au0071025
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	10.0	18	16	26
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5		
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5		
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5		
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5		
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5		
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5		
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5		
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5		
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5		
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5		
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5		
13C4-PFBA (surr.)	1	%	108	95		
13C5-PFPeA (surr.)	1	%	112	118		
13C5-PFHxA (surr.)	1	%	128	131		
13C4-PFHpA (surr.)	1	%	118	109		
13C8-PFOA (surr.)	1	%	110	115		
13C5-PFNA (surr.)	1	%	110	126		
13C6-PFDA (surr.)	1	%	107	117		
13C2-PFUnDA (surr.)	1	%	102	108		
13C2-PFDoDA (surr.)	1	%	100	116		
13C2-PFTeDA (surr.)	1	%	46	102		
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5		
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5		
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5		
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5		
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5		
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10		
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10		

Client Sample ID			BH27_0.01-0.11	BH27_0.4-0.45	BH28_0.01-0.11	BH28_0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071022	M23-Au0071023	M23-Au0071024	M23-Au0071025
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	85	102		
D3-N-MeFOSA (surr.)	1	%	103	107		
D5-N-EtFOSA (surr.)	1	%	91	120		
D7-N-MeFOSE (surr.)	1	%	95	104		
D9-N-EtFOSE (surr.)	1	%	62	94		
D5-N-EtFOSAA (surr.)	1	%	89	108		
D3-N-MeFOSAA (surr.)	1	%	87	107		
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5		
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5		
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5		
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5		
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5		
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5		
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]14	5.7		
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5		
13C3-PFBS (surr.)	1	%	124	121		
18O2-PFHxS (surr.)	1	%	109	116		
13C8-PFOS (surr.)	1	%	108	119		
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5		
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10		
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5		
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5		
13C2-4:2 FTSA (surr.)	1	%	85	82		
13C2-6:2 FTSA (surr.)	1	%	87	82		
13C2-8:2 FTSA (surr.)	1	%	108	126		
13C2-10:2 FTSA (surr.)	1	%	89	112		
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	14	5.7	-	-
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	14	5.7	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	14	5.7	-	-
Sum of WA DWER PFAS (n=10)*	10	ug/kg	14	< 10	-	-
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	-	-

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Client Sample ID			BH29_0.01-0.06	BH29_0.25-0.3	BH30_0.01-0.11	BH30_0.25-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071026	M23-Au0071027	M23-Au0071028	M23-Au0071029
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	11	12	13	17
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg				
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg				
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg				
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg				
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg				
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg				
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg				
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg				
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg				
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg				
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg				
13C4-PFBA (surr.)	1	%				
13C5-PFPeA (surr.)	1	%				
13C5-PFHxA (surr.)	1	%				
13C4-PFHpA (surr.)	1	%				
13C8-PFOA (surr.)	1	%				
13C5-PFNA (surr.)	1	%				
13C6-PFDA (surr.)	1	%				
13C2-PFUnDA (surr.)	1	%				
13C2-PFDoDA (surr.)	1	%				
13C2-PFTeDA (surr.)	1	%				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg				
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg				
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg				
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg				
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg				
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg				
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg				
13C8-FOSA (surr.)	1	%				
D3-N-MeFOSA (surr.)	1	%				
D5-N-EtFOSA (surr.)	1	%				
D7-N-MeFOSE (surr.)	1	%				
D9-N-EtFOSE (surr.)	1	%				
D5-N-EtFOSAA (surr.)	1	%				
D3-N-MeFOSAA (surr.)	1	%				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg				
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg				
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg				
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg				
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg				
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg				

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Client Sample ID			BH29_0.01-0.06	BH29_0.25-0.3	BH30_0.01-0.11	BH30_0.25-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071026	M23-Au0071027	M23-Au0071028	M23-Au0071029
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg				
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg				
13C3-PFBS (surr.)	1	%				
18O2-PFHxS (surr.)	1	%				
13C8-PFOS (surr.)	1	%				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg				
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg				
13C2-4:2 FTSA (surr.)	1	%				
13C2-6:2 FTSA (surr.)	1	%				
13C2-8:2 FTSA (surr.)	1	%				
13C2-10:2 FTSA (surr.)	1	%				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	-	-	-	-
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of WA DWER PFAS (n=10)*	10	ug/kg	-	-	-	-
Sum of PFASs (n=30)*	50	ug/kg	-	-	-	-

Client Sample ID			BH31_0.25-0.35	BH31_0.4-0.5	BH32_0.01-0.11	BH32_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071030	M23-Au0071031	M23-Au0071032	M23-Au0071033
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	16	25	11	8.1
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	%	100	101	99	101
13C5-PFPeA (surr.)	1	%	108	105	105	106
13C5-PFHxA (surr.)	1	%	115	114	114	114

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Client Sample ID			BH31_0.25-0.35	BH31_0.4-0.5	BH32_0.01-0.11	BH32_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071030	M23-Au0071031	M23-Au0071032	M23-Au0071033
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C4-PFHpA (surr.)	1	%	101	97	98	99
13C8-PFOA (surr.)	1	%	98	98	101	102
13C5-PFNA (surr.)	1	%	97	100	98	101
13C6-PFDA (surr.)	1	%	107	110	103	109
13C2-PFUnDA (surr.)	1	%	71	82	73	80
13C2-PFDoDA (surr.)	1	%	64	79	77	74
13C2-PFTeDA (surr.)	1	%	98	106	93	89
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	%	70	78	79	80
D3-N-MeFOSA (surr.)	1	%	100	104	108	106
D5-N-EtFOSA (surr.)	1	%	106	106	107	111
D7-N-MeFOSE (surr.)	1	%	73	81	86	77
D9-N-EtFOSE (surr.)	1	%	84	85	81	85
D5-N-EtFOSAA (surr.)	1	%	105	123	119	118
D3-N-MeFOSAA (surr.)	1	%	67	126	121	87
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	104	103	101	104
18O2-PFHxS (surr.)	1	%	100	98	94	99
13C8-PFOS (surr.)	1	%	78	73	71	83
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	109	104	106
13C2-6:2 FTSA (surr.)	1	%	90	96	93	94
13C2-8:2 FTSA (surr.)	1	%	138	144	137	128
13C2-10:2 FTSA (surr.)	1	%	111	110	111	109

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Client Sample ID			BH31_0.25-0.35	BH31_0.4-0.5	BH32_0.01-0.11	BH32_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071030	M23-Au0071031	M23-Au0071032	M23-Au0071033
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH33_0.4-0.5	BH34_0.01-0.05	BH34_0.4-0.5	BH35_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071034	M23-Au0071035	M23-Au0071036	M23-Au0071037
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	11	11	18	23
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	%	101	99	99	92
13C5-PFPeA (surr.)	1	%	109	105	106	99
13C5-PFHxA (surr.)	1	%	112	110	113	103
13C4-PFHpA (surr.)	1	%	96	94	98	93
13C8-PFOA (surr.)	1	%	102	96	102	95
13C5-PFNA (surr.)	1	%	100	95	102	91
13C6-PFDA (surr.)	1	%	103	103	106	97
13C2-PFUnDA (surr.)	1	%	74	71	89	80
13C2-PFDoDA (surr.)	1	%	94	62	97	89
13C2-PFTeDA (surr.)	1	%	106	90	105	97
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

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Client Sample ID			BH33_0.4-0.5	BH34_0.01-0.05	BH34_0.4-0.5	BH35_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071034	M23-Au0071035	M23-Au0071036	M23-Au0071037
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	82	70	78	72
D3-N-MeFOSA (surr.)	1	%	102	101	107	99
D5-N-EtFOSA (surr.)	1	%	107	104	108	99
D7-N-MeFOSE (surr.)	1	%	91	75	95	81
D9-N-EtFOSE (surr.)	1	%	91	77	91	89
D5-N-EtFOSAA (surr.)	1	%	143	103	136	137
D3-N-MeFOSAA (surr.)	1	%	129	78	134	133
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	[N09]7.6
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	100	98	101	93
18O2-PFHxS (surr.)	1	%	101	91	98	94
13C8-PFOS (surr.)	1	%	74	72	78	71
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	109	100	86
13C2-6:2 FTSA (surr.)	1	%	99	94	99	93
13C2-8:2 FTSA (surr.)	1	%	132	124	118	116
13C2-10:2 FTSA (surr.)	1	%	124	93	142	120
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	7.6
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	7.6
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	7.6
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

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Client Sample ID			BH36_0.01-0.1	BH36_0.4-0.5	BH37_0.01-0.1	BH37_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071038	M23-Au0071039	M23-Au0071040	M23-Au0071041
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	16	17	6.9	13
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5		
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5		
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5		
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5		
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5		
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5		
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5		
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5		
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5		
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5		
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5		
13C4-PFBA (surr.)	1	%	102	98		
13C5-PFPeA (surr.)	1	%	107	103		
13C5-PFHxA (surr.)	1	%	112	105		
13C4-PFHpA (surr.)	1	%	95	89		
13C8-PFOA (surr.)	1	%	100	97		
13C5-PFNA (surr.)	1	%	95	96		
13C6-PFDA (surr.)	1	%	101	101		
13C2-PFUnDA (surr.)	1	%	79	76		
13C2-PFDoDA (surr.)	1	%	91	94		
13C2-PFTeDA (surr.)	1	%	104	102		
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5		
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5		
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5		
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5		
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5		
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10		
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10		
13C8-FOSA (surr.)	1	%	81	76		
D3-N-MeFOSA (surr.)	1	%	102	99		
D5-N-EtFOSA (surr.)	1	%	104	104		
D7-N-MeFOSE (surr.)	1	%	78	86		
D9-N-EtFOSE (surr.)	1	%	89	90		
D5-N-EtFOSAA (surr.)	1	%	131	139		
D3-N-MeFOSAA (surr.)	1	%	133	130		
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5		
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5		
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5		
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5		
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5		
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5		

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Client Sample ID			BH36_0.01-0.1	BH36_0.4-0.5	BH37_0.01-0.1	BH37_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071038	M23-Au0071039	M23-Au0071040	M23-Au0071041
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]11	< 5		
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5		
13C3-PFBS (surr.)	1	%	101	94		
18O2-PFHxS (surr.)	1	%	93	93		
13C8-PFOS (surr.)	1	%	72	78		
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5		
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10		
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5		
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5		
13C2-4:2 FTSA (surr.)	1	%	92	86		
13C2-6:2 FTSA (surr.)	1	%	92	77		
13C2-8:2 FTSA (surr.)	1	%	120	114		
13C2-10:2 FTSA (surr.)	1	%	119	132		
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	11	< 5	-	-
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	11	< 5	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	11	< 5	-	-
Sum of WA DWER PFAS (n=10)*	10	ug/kg	11	< 10	-	-
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	-	-

Client Sample ID			BH38_0.0-0.1	BH38-0.4-0.5	BH39_0.0-0.05	BH39_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071042	M23-Au0071043	M23-Au0071044	M23-Au0071045
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	8.3	15	6.8	18
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg				
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg				
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg				
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg				
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg				
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg				
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg				
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg				
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg				
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg				
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg				
13C4-PFBA (surr.)	1	%				
13C5-PFPeA (surr.)	1	%				
13C5-PFHxA (surr.)	1	%				
13C4-PFHpA (surr.)	1	%				

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Client Sample ID			BH38_0.0-0.1	BH38-0.4-0.5	BH39_0.0-0.05	BH39_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071042	M23-Au0071043	M23-Au0071044	M23-Au0071045
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C8-PFOA (surr.)	1	%				
13C5-PFNA (surr.)	1	%				
13C6-PFDA (surr.)	1	%				
13C2-PFUnDA (surr.)	1	%				
13C2-PFDoDA (surr.)	1	%				
13C2-PFTeDA (surr.)	1	%				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg				
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg				
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg				
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg				
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg				
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg				
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg				
13C8-FOSA (surr.)	1	%				
D3-N-MeFOSA (surr.)	1	%				
D5-N-EtFOSA (surr.)	1	%				
D7-N-MeFOSE (surr.)	1	%				
D9-N-EtFOSE (surr.)	1	%				
D5-N-EtFOSAA (surr.)	1	%				
D3-N-MeFOSAA (surr.)	1	%				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg				
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg				
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg				
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg				
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg				
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg				
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg				
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg				
13C3-PFBS (surr.)	1	%				
18O2-PFHxS (surr.)	1	%				
13C8-PFOS (surr.)	1	%				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg				
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg				
13C2-4:2 FTSA (surr.)	1	%				
13C2-6:2 FTSA (surr.)	1	%				
13C2-8:2 FTSA (surr.)	1	%				
13C2-10:2 FTSA (surr.)	1	%				

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Client Sample ID			BH38_0.0-0.1	BH38-0.4-0.5	BH39_0.0-0.05	BH39_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071042	M23-Au0071043	M23-Au0071044	M23-Au0071045
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	-	-	-	-
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of WA DWER PFAS (n=10)*	10	ug/kg	-	-	-	-
Sum of PFASs (n=30)*	50	ug/kg	-	-	-	-

Client Sample ID			BH40_0.0-0.1	BH40_0.4-0.5	BH41_0.01-0.1	BH41_0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071046	M23-Au0071047	M23-Au0071048	M23-Au0071049
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	7.2	7.3	18	12
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg				
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg				
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg				
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg				
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg				
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg				
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg				
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg				
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg				
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg				
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg				
13C4-PFBA (surr.)	1	%				
13C5-PFPeA (surr.)	1	%				
13C5-PFHxA (surr.)	1	%				
13C4-PFHpA (surr.)	1	%				
13C8-PFOA (surr.)	1	%				
13C5-PFNA (surr.)	1	%				
13C6-PFDA (surr.)	1	%				
13C2-PFUnDA (surr.)	1	%				
13C2-PFDoDA (surr.)	1	%				
13C2-PFTeDA (surr.)	1	%				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg				
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg				
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg				
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg				
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg				
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg				
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg				

Client Sample ID			BH40_0.0-0.1	BH40_0.4-0.5	BH41_0.01-0.1	BH41_0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071046	M23-Au0071047	M23-Au0071048	M23-Au0071049
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%				
D3-N-MeFOSA (surr.)	1	%				
D5-N-EtFOSA (surr.)	1	%				
D7-N-MeFOSE (surr.)	1	%				
D9-N-EtFOSE (surr.)	1	%				
D5-N-EtFOSAA (surr.)	1	%				
D3-N-MeFOSAA (surr.)	1	%				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg				
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg				
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg				
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg				
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg				
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg				
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg				
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg				
13C3-PFBS (surr.)	1	%				
18O2-PFHxS (surr.)	1	%				
13C8-PFOS (surr.)	1	%				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg				
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg				
13C2-4:2 FTSA (surr.)	1	%				
13C2-6:2 FTSA (surr.)	1	%				
13C2-8:2 FTSA (surr.)	1	%				
13C2-10:2 FTSA (surr.)	1	%				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	-	-	-	-
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of WA DWER PFAS (n=10)*	10	ug/kg	-	-	-	-
Sum of PFASs (n=30)*	50	ug/kg	-	-	-	-

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Client Sample ID			BH42_0.0-0.1	BH42_0.4-0.5	BH43_0.01-0.1	BH43_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071050	M23-Au0071051	M23-Au0071052	M23-Au0071053
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	13	9.9	12	11
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg				
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg				
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg				
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg				
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg				
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg				
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg				
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg				
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg				
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg				
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg				
13C4-PFBA (surr.)	1	%				
13C5-PFPeA (surr.)	1	%				
13C5-PFHxA (surr.)	1	%				
13C4-PFHpA (surr.)	1	%				
13C8-PFOA (surr.)	1	%				
13C5-PFNA (surr.)	1	%				
13C6-PFDA (surr.)	1	%				
13C2-PFUnDA (surr.)	1	%				
13C2-PFDoDA (surr.)	1	%				
13C2-PFTeDA (surr.)	1	%				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg				
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg				
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg				
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg				
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg				
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg				
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg				
13C8-FOSA (surr.)	1	%				
D3-N-MeFOSA (surr.)	1	%				
D5-N-EtFOSA (surr.)	1	%				
D7-N-MeFOSE (surr.)	1	%				
D9-N-EtFOSE (surr.)	1	%				
D5-N-EtFOSAA (surr.)	1	%				
D3-N-MeFOSAA (surr.)	1	%				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg				
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg				
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg				
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg				
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg				
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg				

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Client Sample ID			BH42_0.0-0.1	BH42_0.4-0.5	BH43_0.01-0.1	BH43_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071050	M23-Au0071051	M23-Au0071052	M23-Au0071053
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg				
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg				
13C3-PFBS (surr.)	1	%				
18O2-PFHxS (surr.)	1	%				
13C8-PFOS (surr.)	1	%				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg				
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg				
13C2-4:2 FTSA (surr.)	1	%				
13C2-6:2 FTSA (surr.)	1	%				
13C2-8:2 FTSA (surr.)	1	%				
13C2-10:2 FTSA (surr.)	1	%				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	-	-	-	-
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of WA DWER PFAS (n=10)*	10	ug/kg	-	-	-	-
Sum of PFASs (n=30)*	50	ug/kg	-	-	-	-

Client Sample ID			BH44_0.0-0.1	BH44_0.4-0.5	BH45_0.0-0.05	BH45_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071054	M23-Au0071055	M23-Au0071056	M23-Au0071057
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	13	25	19	12
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg				
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg				
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg				
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg				
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg				
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg				
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg				
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg				
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg				
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg				
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg				
13C4-PFBA (surr.)	1	%				
13C5-PFPeA (surr.)	1	%				
13C5-PFHxA (surr.)	1	%				
13C4-PFHpA (surr.)	1	%				

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Client Sample ID			BH44_0.0-0.1	BH44_0.4-0.5	BH45_0.0-0.05	BH45_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071054	M23-Au0071055	M23-Au0071056	M23-Au0071057
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C8-PFOA (surr.)	1	%				
13C5-PFNA (surr.)	1	%				
13C6-PFDA (surr.)	1	%				
13C2-PFUnDA (surr.)	1	%				
13C2-PFDoDA (surr.)	1	%				
13C2-PFTeDA (surr.)	1	%				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg				
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg				
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg				
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg				
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg				
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg				
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg				
13C8-FOSA (surr.)	1	%				
D3-N-MeFOSA (surr.)	1	%				
D5-N-EtFOSA (surr.)	1	%				
D7-N-MeFOSE (surr.)	1	%				
D9-N-EtFOSE (surr.)	1	%				
D5-N-EtFOSAA (surr.)	1	%				
D3-N-MeFOSAA (surr.)	1	%				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg				
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg				
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg				
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg				
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg				
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg				
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg				
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg				
13C3-PFBS (surr.)	1	%				
18O2-PFHxS (surr.)	1	%				
13C8-PFOS (surr.)	1	%				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg				
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg				
13C2-4:2 FTSA (surr.)	1	%				
13C2-6:2 FTSA (surr.)	1	%				
13C2-8:2 FTSA (surr.)	1	%				
13C2-10:2 FTSA (surr.)	1	%				

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Client Sample ID			BH44_0.0-0.1	BH44_0.4-0.5	BH45_0.0-0.05	BH45_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071054	M23-Au0071055	M23-Au0071056	M23-Au0071057
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	-	-	-	-
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of WA DWER PFAS (n=10)*	10	ug/kg	-	-	-	-
Sum of PFASs (n=30)*	50	ug/kg	-	-	-	-

Client Sample ID			BH46_0.0-0.1	BH46_0.4-0.5	BH47_0.0-0.1	BH47_0.45-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071058	M23-Au0071059	M23-Au0071060	M23-Au0071061
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	16	22	15	18
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg				
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg				
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg				
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg				
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg				
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg				
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg				
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg				
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg				
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg				
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg				
13C4-PFBA (surr.)	1	%				
13C5-PFPeA (surr.)	1	%				
13C5-PFHxA (surr.)	1	%				
13C4-PFHpA (surr.)	1	%				
13C8-PFOA (surr.)	1	%				
13C5-PFNA (surr.)	1	%				
13C6-PFDA (surr.)	1	%				
13C2-PFUnDA (surr.)	1	%				
13C2-PFDoDA (surr.)	1	%				
13C2-PFTeDA (surr.)	1	%				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg				
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg				
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg				
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg				
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg				
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg				
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg				

Client Sample ID			BH46_0.0-0.1	BH46_0.4-0.5	BH47_0.0-0.1	BH47_0.45-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071058	M23-Au0071059	M23-Au0071060	M23-Au0071061
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%				
D3-N-MeFOSA (surr.)	1	%				
D5-N-EtFOSA (surr.)	1	%				
D7-N-MeFOSE (surr.)	1	%				
D9-N-EtFOSE (surr.)	1	%				
D5-N-EtFOSAA (surr.)	1	%				
D3-N-MeFOSAA (surr.)	1	%				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg				
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg				
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg				
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg				
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg				
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg				
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg				
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg				
13C3-PFBS (surr.)	1	%				
18O2-PFHxS (surr.)	1	%				
13C8-PFOS (surr.)	1	%				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg				
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg				
13C2-4:2 FTSA (surr.)	1	%				
13C2-6:2 FTSA (surr.)	1	%				
13C2-8:2 FTSA (surr.)	1	%				
13C2-10:2 FTSA (surr.)	1	%				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	-	-	-	-
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of WA DWER PFAS (n=10)*	10	ug/kg	-	-	-	-
Sum of PFASs (n=30)*	50	ug/kg	-	-	-	-

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Client Sample ID			SED01	SED02	SED03	FD01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071062	M23-Au0071063	M23-Au0071064	M23-Au0071065
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 23, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	34	31	24	19
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg				
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg				
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg				
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg				
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg				
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg				
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg				
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg				
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg				
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg				
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg				
13C4-PFBA (surr.)	1	%				
13C5-PFPeA (surr.)	1	%				
13C5-PFHxA (surr.)	1	%				
13C4-PFHpA (surr.)	1	%				
13C8-PFOA (surr.)	1	%				
13C5-PFNA (surr.)	1	%				
13C6-PFDA (surr.)	1	%				
13C2-PFUnDA (surr.)	1	%				
13C2-PFDoDA (surr.)	1	%				
13C2-PFTeDA (surr.)	1	%				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg				
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg				
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg				
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg				
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg				
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg				
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg				
13C8-FOSA (surr.)	1	%				
D3-N-MeFOSA (surr.)	1	%				
D5-N-EtFOSA (surr.)	1	%				
D7-N-MeFOSE (surr.)	1	%				
D9-N-EtFOSE (surr.)	1	%				
D5-N-EtFOSAA (surr.)	1	%				
D3-N-MeFOSAA (surr.)	1	%				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg				
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg				
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg				
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg				
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg				
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg				

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Client Sample ID			SED01	SED02	SED03	FD01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071062	M23-Au0071063	M23-Au0071064	M23-Au0071065
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 23, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg				
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg				
13C3-PFBS (surr.)	1	%				
18O2-PFHxS (surr.)	1	%				
13C8-PFOS (surr.)	1	%				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg				
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg				
13C2-4:2 FTSA (surr.)	1	%				
13C2-6:2 FTSA (surr.)	1	%				
13C2-8:2 FTSA (surr.)	1	%				
13C2-10:2 FTSA (surr.)	1	%				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	-	-	-	-
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of WA DWER PFAS (n=10)*	10	ug/kg	-	-	-	-
Sum of PFASs (n=30)*	50	ug/kg	-	-	-	-

Client Sample ID			FD02	FD03	FD04	FD05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071066	M23-Au0071067	M23-Au0071068	M23-Au0071069
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	15	17	24	21
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg				
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg				
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg				
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg				
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg				
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg				
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg				
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg				
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg				
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg				
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg				
13C4-PFBA (surr.)	1	%				
13C5-PFPeA (surr.)	1	%				
13C5-PFHxA (surr.)	1	%				
13C4-PFHpA (surr.)	1	%				

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Client Sample ID			FD02	FD03	FD04	FD05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071066	M23-Au0071067	M23-Au0071068	M23-Au0071069
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C8-PFOA (surr.)	1	%				
13C5-PFNA (surr.)	1	%				
13C6-PFDA (surr.)	1	%				
13C2-PFUnDA (surr.)	1	%				
13C2-PFDoDA (surr.)	1	%				
13C2-PFTeDA (surr.)	1	%				
Perfluoroalkyl sulfonamido substances						
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg				
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg				
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg				
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg				
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg				
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg				
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg				
13C8-FOSA (surr.)	1	%				
D3-N-MeFOSA (surr.)	1	%				
D5-N-EtFOSA (surr.)	1	%				
D7-N-MeFOSE (surr.)	1	%				
D9-N-EtFOSE (surr.)	1	%				
D5-N-EtFOSAA (surr.)	1	%				
D3-N-MeFOSAA (surr.)	1	%				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg				
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg				
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg				
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg				
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg				
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg				
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg				
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg				
13C3-PFBS (surr.)	1	%				
18O2-PFHxS (surr.)	1	%				
13C8-PFOS (surr.)	1	%				
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)						
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg				
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg				
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg				
13C2-4:2 FTSA (surr.)	1	%				
13C2-6:2 FTSA (surr.)	1	%				
13C2-8:2 FTSA (surr.)	1	%				
13C2-10:2 FTSA (surr.)	1	%				

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Client Sample ID			FD02	FD03	FD04	FD05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071066	M23-Au0071067	M23-Au0071068	M23-Au0071069
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	-	-	-	-
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	-	-	-	-
Sum of WA DWER PFAS (n=10)*	10	ug/kg	-	-	-	-
Sum of PFASs (n=30)*	50	ug/kg	-	-	-	-

Client Sample ID			FD06	FD07	FD08
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071070	M23-Au0071071	M23-Au0071072
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit			
Sample Properties					
% Moisture	1	%	10	14	27
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg			
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg			
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg			
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg			
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg			
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg			
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg			
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg			
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg			
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg			
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg			
13C4-PFBA (surr.)	1	%			
13C5-PFPeA (surr.)	1	%			
13C5-PFHxA (surr.)	1	%			
13C4-PFHpA (surr.)	1	%			
13C8-PFOA (surr.)	1	%			
13C5-PFNA (surr.)	1	%			
13C6-PFDA (surr.)	1	%			
13C2-PFUnDA (surr.)	1	%			
13C2-PFDoDA (surr.)	1	%			
13C2-PFTeDA (surr.)	1	%			
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg			
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg			
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg			
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg			
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg			
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg			
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg			

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Client Sample ID			FD06	FD07	FD08
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071070	M23-Au0071071	M23-Au0071072
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonamido substances					
13C8-FOSA (surr.)	1	%			
D3-N-MeFOSA (surr.)	1	%			
D5-N-EtFOSA (surr.)	1	%			
D7-N-MeFOSE (surr.)	1	%			
D9-N-EtFOSE (surr.)	1	%			
D5-N-EtFOSAA (surr.)	1	%			
D3-N-MeFOSAA (surr.)	1	%			
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg			
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg			
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg			
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg			
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg			
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg			
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg			
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg			
13C3-PFBS (surr.)	1	%			
18O2-PFHxS (surr.)	1	%			
13C8-PFOS (surr.)	1	%			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg			
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg			
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg			
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg			
13C2-4:2 FTSA (surr.)	1	%			
13C2-6:2 FTSA (surr.)	1	%			
13C2-8:2 FTSA (surr.)	1	%			
13C2-10:2 FTSA (surr.)	1	%			
PFASs Summations					
Sum (PFHxS + PFOS)*	5	ug/kg	-	-	-
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	-	-	-
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	-	-	-
Sum of WA DWER PFAS (n=10)*	10	ug/kg	-	-	-
Sum of PFASs (n=30)*	50	ug/kg	-	-	-

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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	Aug 28, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Aug 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Aug 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Aug 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Aug 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Aug 28, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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eurofins

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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
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Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1020822
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Aug 28, 2023 1:46 PM
Due: Sep 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH14_0.4-0.5	Aug 23, 2023		Soil	M23-Au0070998		X	X
2	BH15_0.4-0.5	Aug 23, 2023		Soil	M23-Au0070999		X	X
3	BH16_0.1-0.2	Aug 23, 2023		Soil	M23-Au0071000		X	X
4	BH16_0.4-0.6	Aug 23, 2023		Soil	M23-Au0071001		X	X
5	BH17_0.25-0.42	Aug 23, 2023		Soil	M23-Au0071002		X	X
6	BH18_0.9-1.0	Aug 23, 2023		Soil	M23-Au0071003		X	X
7	BH09_0.9-1.0	Aug 23, 2023		Soil	M23-Au0071004		X	X
8	BH10_0.4-0.5	Aug 23, 2023		Soil	M23-Au0071005		X	X
9	BH11_0.9-1.0	Aug 23, 2023		Soil	M23-Au0071006		X	X
10	BH12_0.6-0.7	Aug 24, 2023		Soil	M23-Au0071007		X	X
11	BH13_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071008		X	X
12	BH19_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071009		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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Contact Name: Tom Duncan

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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
13	BH19_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071010		X	X
14	BH20_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071011		X	X
15	BH20_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071012		X	X
16	BH21_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071013		X	X
17	BH21_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071014		X	X
18	BH22_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071015		X	X
19	BH22_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071016		X	X
20	BH23_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071017		X	X
21	BH23_0.2-0.32	Aug 24, 2023		Soil	M23-Au0071018		X	X
22	BH24_0.5-0.6	Aug 24, 2023		Soil	M23-Au0071019		X	X
23	BH25_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071020		X	X
24	BH26_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071021		X	X
25	BH27_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071022		X	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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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
26	BH27_0.4-0.45	Aug 24, 2023		Soil	M23-Au0071023		X	X
27	BH28_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071024		X	X
28	BH28_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071025		X	X
29	BH29_0.01-0.06	Aug 24, 2023		Soil	M23-Au0071026		X	X
30	BH29_0.25-0.3	Aug 24, 2023		Soil	M23-Au0071027		X	X
31	BH30_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071028		X	X
32	BH30_0.25-0.3	Aug 24, 2023		Soil	M23-Au0071029		X	X
33	BH31_0.25-0.35	Aug 24, 2023		Soil	M23-Au0071030		X	X
34	BH31_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071031		X	X
35	BH32_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071032		X	X
36	BH32_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071033		X	X
37	BH33_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071034		X	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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Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
38	BH34_0.01-0.05	Aug 25, 2023		Soil	M23-Au0071035		X	X
39	BH34_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071036		X	X
40	BH35_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071037		X	X
41	BH36_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071038		X	X
42	BH36_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071039		X	X
43	BH37_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071040		X	X
44	BH37_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071041		X	X
45	BH38_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071042		X	X
46	BH38-0.4-0.5	Aug 25, 2023		Soil	M23-Au0071043		X	X
47	BH39_0.0-0.05	Aug 25, 2023		Soil	M23-Au0071044		X	X
48	BH39_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071045		X	X
49	BH40_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071046		X	X
50	BH40_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071047		X	X
51	BH41_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071048		X	X
52	BH41_0.9-1.0	Aug 25, 2023		Soil	M23-Au0071049		X	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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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
53	BH42_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071050		X	X
54	BH42_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071051		X	X
55	BH43_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071052		X	X
56	BH43_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071053		X	X
57	BH44_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071054		X	X
58	BH44_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071055		X	X
59	BH45_0.0-0.05	Aug 25, 2023		Soil	M23-Au0071056		X	X
60	BH45_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071057		X	X
61	BH46_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071058		X	X
62	BH46_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071059		X	X
63	BH47_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071060		X	X
64	BH47_0.45-0.5	Aug 25, 2023		Soil	M23-Au0071061		X	X
65	SED01	Aug 24, 2023		Soil	M23-Au0071062		X	X
66	SED02	Aug 24, 2023		Soil	M23-Au0071063		X	X
67	SED03	Aug 24, 2023		Soil	M23-Au0071064		X	X
68	FD01	Aug 23, 2023		Soil	M23-Au0071065		X	X

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
69	FD02	Aug 24, 2023		Soil	M23-Au0071066		X	X
70	FD03	Aug 24, 2023		Soil	M23-Au0071067		X	X
71	FD04	Aug 24, 2023		Soil	M23-Au0071068		X	X
72	FD05	Aug 24, 2023		Soil	M23-Au0071069		X	X
73	FD06	Aug 25, 2023		Soil	M23-Au0071070		X	X
74	FD07	Aug 25, 2023		Soil	M23-Au0071071		X	X
75	FD08	Aug 25, 2023		Soil	M23-Au0071072		X	X
76	RB01A	Aug 23, 2023		Water	M23-Au0071073			X
77	RB01B	Aug 23, 2023		Water	M23-Au0071074			X
78	RB02A	Aug 24, 2023		Water	M23-Au0071075			X
79	RB03A	Aug 25, 2023		Water	M23-Au0071076			X
80	BH14_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071077	X		
81	BH14_0.1-0.15	Aug 23, 2023		Soil	M23-Au0071078	X		
82	BH14_0.2-0.3	Aug 23, 2023		Soil	M23-Au0071079	X		
83	BH15_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071080	X		
84	BH15_0.1-0.2	Aug 23, 2023		Soil	M23-Au0071081	X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
85	BH15_0.2-0.4	Aug 23, 2023		Soil	M23-Au0071082	X		
86	BH16_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071083	X		
87	BH17_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071084	X		
88	BH17_0.1-0.25	Aug 23, 2023		Soil	M23-Au0071085	X		
89	BH18_0.01-0.15	Aug 23, 2023		Soil	M23-Au0071086	X		
90	BH18_0.15-0.25	Aug 23, 2023		Soil	M23-Au0071087	X		
91	BH18_0.25-0.35	Aug 23, 2023		Soil	M23-Au0071088	X		
92	BH09_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071089	X		
93	BH09_0.2-0.3	Aug 23, 2023		Soil	M23-Au0071090	X		
94	BH09_0.4-0.5	Aug 23, 2023		Soil	M23-Au0071091	X		
95	BH10_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071092	X		
96	BH10_0.2-0.3	Aug 23, 2023		Soil	M23-Au0071093	X		
97	BH11_0.0-0.1	Aug 23, 2023		Soil	M23-Au0071094	X		
98	BH11_0.25-	Aug 23, 2023		Soil	M23-Au0071095	X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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IANZ# 1327	IANZ# 1290	IANZ# 1402

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

Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1020822
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Aug 28, 2023 1:46 PM
Due: Sep 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
	0.35							
99	BH12_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071096	X		
100	BH12_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071097	X		
101	BH13_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071098	X		
102	BH13_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071100	X		
103	BH19_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071101	X		
104	BH20_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071102	X		
105	BH21_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071103	X		
106	BH22_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071104	X		
107	BH23_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071105	X		
108	BH24_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071106	X		
109	BH24_0.25-0.35	Aug 24, 2023		Soil	M23-Au0071107	X		
110	BH25_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071108	X		
111	BH25_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071109	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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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
112	BH26_0.01-0.06	Aug 24, 2023		Soil	M23-Au0071110	X		
113	BH26_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071111	X		
114	BH27_0.3-0.4	Aug 24, 2023		Soil	M23-Au0071112	X		
115	BH29_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071113	X		
116	BH30_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071114	X		
117	BH31_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071115	X		
118	BH32_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071116	X		
119	BH33_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071117	X		
120	BH33_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071118	X		
121	BH34_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071119	X		
122	BH35_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071120	X		
123	BH36_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071121	X		
124	BH37_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071122	X		
125	BH38_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071123	X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
126	BH39_0.05-0.1	Aug 25, 2023		Soil	M23-Au0071124	X		
127	BH39_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071125	X		
128	BH40_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071126	X		
129	BH41_0.45-0.55	Aug 25, 2023		Soil	M23-Au0071127	X		
130	BH42_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071128	X		
131	BH43_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071129	X		
132	BH44_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071130	X		
133	BH45_0.1-0.15	Aug 25, 2023		Soil	M23-Au0071131	X		
134	BH45_0.2-0.24	Aug 25, 2023		Soil	M23-Au0071132	X		
135	BH46_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071133	X		
136	BH47_0.15-0.25	Aug 25, 2023		Soil	M23-Au0071134	X		
137	BH47_0.35-0.45	Aug 25, 2023		Soil	M23-Au0071135	X		
Test Counts						58	75	79

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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.

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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:

Joseph Edouard	Senior Analyst-PFAS
Mary Makarios	Senior Analyst-Sample Properties

Glenn Jackson
Managing Director

- 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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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						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH14_0.4-0.5	Aug 23, 2023		Soil	M23-Au0070998		X	X
2	BH15_0.4-0.5	Aug 23, 2023		Soil	M23-Au0070999		X	X
3	BH16_0.1-0.2	Aug 23, 2023		Soil	M23-Au0071000		X	X
4	BH16_0.4-0.6	Aug 23, 2023		Soil	M23-Au0071001		X	X
5	BH17_0.25-0.42	Aug 23, 2023		Soil	M23-Au0071002		X	X
6	BH18_0.9-1.0	Aug 23, 2023		Soil	M23-Au0071003		X	X
7	BH09_0.9-1.0	Aug 23, 2023		Soil	M23-Au0071004		X	X
8	BH10_0.4-0.5	Aug 23, 2023		Soil	M23-Au0071005		X	X
9	BH11_0.9-1.0	Aug 23, 2023		Soil	M23-Au0071006		X	X
10	BH12_0.6-0.7	Aug 24, 2023		Soil	M23-Au0071007		X	X
11	BH13_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071008		X	X
12	BH19_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071009		X	X

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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14	BH20_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071011		X	X
15	BH20_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071012		X	X
16	BH21_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071013		X	X
17	BH21_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071014		X	X
18	BH22_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071015		X	X
19	BH22_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071016		X	X
20	BH23_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071017		X	X
21	BH23_0.2-0.32	Aug 24, 2023		Soil	M23-Au0071018		X	X
22	BH24_0.5-0.6	Aug 24, 2023		Soil	M23-Au0071019		X	X
23	BH25_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071020		X	X
24	BH26_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071021		X	X
25	BH27_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071022		X	X

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26	BH27_0.4-0.45	Aug 24, 2023		Soil	M23-Au0071023		X	X
27	BH28_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071024		X	X
28	BH28_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071025		X	X
29	BH29_0.01-0.06	Aug 24, 2023		Soil	M23-Au0071026		X	X
30	BH29_0.25-0.3	Aug 24, 2023		Soil	M23-Au0071027		X	X
31	BH30_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071028		X	X
32	BH30_0.25-0.3	Aug 24, 2023		Soil	M23-Au0071029		X	X
33	BH31_0.25-0.35	Aug 24, 2023		Soil	M23-Au0071030		X	X
34	BH31_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071031		X	X
35	BH32_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071032		X	X
36	BH32_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071033		X	X
37	BH33_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071034		X	X

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Company Name: GHD Pty Ltd SA
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Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1020822
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Aug 28, 2023 1:46 PM
Due: Sep 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
38	BH34_0.01-0.05	Aug 25, 2023		Soil	M23-Au0071035		X	X
39	BH34_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071036		X	X
40	BH35_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071037		X	X
41	BH36_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071038		X	X
42	BH36_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071039		X	X
43	BH37_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071040		X	X
44	BH37_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071041		X	X
45	BH38_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071042		X	X
46	BH38-0.4-0.5	Aug 25, 2023		Soil	M23-Au0071043		X	X
47	BH39_0.0-0.05	Aug 25, 2023		Soil	M23-Au0071044		X	X
48	BH39_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071045		X	X
49	BH40_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071046		X	X
50	BH40_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071047		X	X
51	BH41_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071048		X	X
52	BH41_0.9-1.0	Aug 25, 2023		Soil	M23-Au0071049		X	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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Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
53	BH42_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071050		X	X
54	BH42_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071051		X	X
55	BH43_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071052		X	X
56	BH43_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071053		X	X
57	BH44_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071054		X	X
58	BH44_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071055		X	X
59	BH45_0.0-0.05	Aug 25, 2023		Soil	M23-Au0071056		X	X
60	BH45_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071057		X	X
61	BH46_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071058		X	X
62	BH46_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071059		X	X
63	BH47_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071060		X	X
64	BH47_0.45-0.5	Aug 25, 2023		Soil	M23-Au0071061		X	X
65	SED01	Aug 24, 2023		Soil	M23-Au0071062		X	X
66	SED02	Aug 24, 2023		Soil	M23-Au0071063		X	X
67	SED03	Aug 24, 2023		Soil	M23-Au0071064		X	X
68	FD01	Aug 23, 2023		Soil	M23-Au0071065		X	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						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
69	FD02	Aug 24, 2023		Soil	M23-Au0071066		X	X
70	FD03	Aug 24, 2023		Soil	M23-Au0071067		X	X
71	FD04	Aug 24, 2023		Soil	M23-Au0071068		X	X
72	FD05	Aug 24, 2023		Soil	M23-Au0071069		X	X
73	FD06	Aug 25, 2023		Soil	M23-Au0071070		X	X
74	FD07	Aug 25, 2023		Soil	M23-Au0071071		X	X
75	FD08	Aug 25, 2023		Soil	M23-Au0071072		X	X
76	RB01A	Aug 23, 2023		Water	M23-Au0071073			X
77	RB01B	Aug 23, 2023		Water	M23-Au0071074			X
78	RB02A	Aug 24, 2023		Water	M23-Au0071075			X
79	RB03A	Aug 25, 2023		Water	M23-Au0071076			X
80	BH14_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071077	X		
81	BH14_0.1-0.15	Aug 23, 2023		Soil	M23-Au0071078	X		
82	BH14_0.2-0.3	Aug 23, 2023		Soil	M23-Au0071079	X		
83	BH15_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071080	X		
84	BH15_0.1-0.2	Aug 23, 2023		Soil	M23-Au0071081	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						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
85	BH15_0.2-0.4	Aug 23, 2023		Soil	M23-Au0071082	X		
86	BH16_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071083	X		
87	BH17_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071084	X		
88	BH17_0.1-0.25	Aug 23, 2023		Soil	M23-Au0071085	X		
89	BH18_0.01-0.15	Aug 23, 2023		Soil	M23-Au0071086	X		
90	BH18_0.15-0.25	Aug 23, 2023		Soil	M23-Au0071087	X		
91	BH18_0.25-0.35	Aug 23, 2023		Soil	M23-Au0071088	X		
92	BH09_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071089	X		
93	BH09_0.2-0.3	Aug 23, 2023		Soil	M23-Au0071090	X		
94	BH09_0.4-0.5	Aug 23, 2023		Soil	M23-Au0071091	X		
95	BH10_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071092	X		
96	BH10_0.2-0.3	Aug 23, 2023		Soil	M23-Au0071093	X		
97	BH11_0.0-0.1	Aug 23, 2023		Soil	M23-Au0071094	X		
98	BH11_0.25-	Aug 23, 2023		Soil	M23-Au0071095	X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
	0.35							
99	BH12_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071096	X		
100	BH12_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071097	X		
101	BH13_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071098	X		
102	BH13_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071100	X		
103	BH19_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071101	X		
104	BH20_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071102	X		
105	BH21_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071103	X		
106	BH22_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071104	X		
107	BH23_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071105	X		
108	BH24_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071106	X		
109	BH24_0.25-0.35	Aug 24, 2023		Soil	M23-Au0071107	X		
110	BH25_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071108	X		
111	BH25_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071109	X		

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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
112	BH26_0.01-0.06	Aug 24, 2023		Soil	M23-Au0071110	X		
113	BH26_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071111	X		
114	BH27_0.3-0.4	Aug 24, 2023		Soil	M23-Au0071112	X		
115	BH29_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071113	X		
116	BH30_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071114	X		
117	BH31_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071115	X		
118	BH32_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071116	X		
119	BH33_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071117	X		
120	BH33_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071118	X		
121	BH34_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071119	X		
122	BH35_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071120	X		
123	BH36_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071121	X		
124	BH37_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071122	X		
125	BH38_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071123	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						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
126	BH39_0.05-0.1	Aug 25, 2023		Soil	M23-Au0071124	X		
127	BH39_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071125	X		
128	BH40_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071126	X		
129	BH41_0.45-0.55	Aug 25, 2023		Soil	M23-Au0071127	X		
130	BH42_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071128	X		
131	BH43_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071129	X		
132	BH44_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071130	X		
133	BH45_0.1-0.15	Aug 25, 2023		Soil	M23-Au0071131	X		
134	BH45_0.2-0.24	Aug 25, 2023		Soil	M23-Au0071132	X		
135	BH46_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071133	X		
136	BH47_0.15-0.25	Aug 25, 2023		Soil	M23-Au0071134	X		
137	BH47_0.35-0.45	Aug 25, 2023		Soil	M23-Au0071135	X		
Test Counts						58	75	79

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Eurofins Environment Testing Australia Pty Ltd

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Site# 1254	Site# 25403	Site# 18217	Site# 25466	Site# 20794	

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IANZ# 1327	IANZ# 1290	IANZ# 1402

Sample Receipt Advice

Company name:	GHD Pty Ltd SA
Contact name:	Tom Duncan
Project name:	MFS Oakden DSI
Project ID:	12611126
Turnaround time:	5 Day
Date/Time received	Aug 28, 2023 1:46 PM
Eurofins reference	1020822

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

BH30_0.1-0.2 received instead of BH30_0.05-0.15. BH13_0.1-0.2 included twice on COC

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.

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 **1020822-S**
Project name MFS Oakden DSI
Project ID 12611126
Received Date Aug 28, 2023

Client Sample ID			**BH14_0.4-0.5**	**BH15_0.4-0.5**	**BH16_0.1-0.2**	**BH16_0.4-0.6**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M23-Au0070998**	**M23-Au0070999**	**M23-Au0071000**	**M23-Au0071001**
Date Sampled			**Aug 23, 2023**	**Aug 23, 2023**	**Aug 23, 2023**	**Aug 23, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	18	19	23	19
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	%	105	112	110	110
13C5-PFPeA (surr.)	1	%	123	131	130	125
13C5-PFHxA (surr.)	1	%	113	124	116	119
13C4-PFHpA (surr.)	1	%	105	117	108	131
13C8-PFOA (surr.)	1	%	121	124	124	127
13C5-PFNA (surr.)	1	%	132	139	137	132
13C6-PFDA (surr.)	1	%	108	114	114	114
13C2-PFUnDA (surr.)	1	%	109	112	105	115
13C2-PFDoDA (surr.)	1	%	121	128	122	126
13C2-PFTeDA (surr.)	1	%	143	139	122	126
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			BH14_0.4-0.5	BH15_0.4-0.5	BH16_0.1-0.2	BH16_0.4-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0070998	M23-Au0070999	M23-Au0071000	M23-Au0071001
Date Sampled			Aug 23, 2023	Aug 23, 2023	Aug 23, 2023	Aug 23, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	121	122	123	120
D3-N-MeFOSA (surr.)	1	%	117	124	122	114
D5-N-EtFOSA (surr.)	1	%	131	131	129	129
D7-N-MeFOSE (surr.)	1	%	116	128	114	113
D9-N-EtFOSE (surr.)	1	%	119	129	124	124
D5-N-EtFOSAA (surr.)	1	%	138	144	128	142
D3-N-MeFOSAA (surr.)	1	%	123	120	115	123
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	132	134	136	128
18O2-PFHxS (surr.)	1	%	124	121	130	121
13C8-PFOS (surr.)	1	%	124	124	126	121
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	%	107	112	108	107
13C2-6:2 FTSA (surr.)	1	%	120	119	109	119
13C2-8:2 FTSA (surr.)	1	%	134	135	131	130
13C2-10:2 FTSA (surr.)	1	%	119	133	127	131
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH17_0.25-0.42	BH18_0.9-1.0	BH09_0.9-1.0	BH10_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071002	M23-Au0071003	M23-Au0071004	M23-Au0071005
Date Sampled			Aug 23, 2023	Aug 23, 2023	Aug 23, 2023	Aug 23, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	22	15	22	24
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	%	107	55	104	46
13C5-PFPeA (surr.)	1	%	128	64	126	51
13C5-PFHxA (surr.)	1	%	130	57	115	49
13C4-PFHpA (surr.)	1	%	108	52	111	46
13C8-PFOA (surr.)	1	%	125	53	125	51
13C5-PFNA (surr.)	1	%	129	69	124	55
13C6-PFDA (surr.)	1	%	108	49	105	48
13C2-PFUnDA (surr.)	1	%	109	52	105	49
13C2-PFDoDA (surr.)	1	%	121	59	123	50
13C2-PFTeDA (surr.)	1	%	124	48	127	37
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	%	118	62	120	54
D3-N-MeFOSA (surr.)	1	%	115	58	117	48
D5-N-EtFOSA (surr.)	1	%	129	63	132	54
D7-N-MeFOSE (surr.)	1	%	112	59	116	50
D9-N-EtFOSE (surr.)	1	%	123	58	126	47
D5-N-EtFOSAA (surr.)	1	%	142	58	147	59
D3-N-MeFOSAA (surr.)	1	%	121	56	119	51
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			BH17_0.25-0.42	BH18_0.9-1.0	BH09_0.9-1.0	BH10_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071002	M23-Au0071003	M23-Au0071004	M23-Au0071005
Date Sampled			Aug 23, 2023	Aug 23, 2023	Aug 23, 2023	Aug 23, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	131	66	131	57
18O2-PFHxS (surr.)	1	%	120	60	121	52
13C8-PFOS (surr.)	1	%	125	64	118	54
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	%	109	55	106	47
13C2-6:2 FTSA (surr.)	1	%	119	63	135	50
13C2-8:2 FTSA (surr.)	1	%	118	69	121	51
13C2-10:2 FTSA (surr.)	1	%	127	60	127	49
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH11_0.9-1.0	BH12_0.6-0.7	BH13_0.4-0.5	BH19_0.01-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071006	M23-Au0071007	M23-Au0071008	M23-Au0071009
Date Sampled			Aug 23, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	22	16	11	16
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	< 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	%	64	112	105	109
13C5-PFPeA (surr.)	1	%	73	133	128	121
13C5-PFHxA (surr.)	1	%	68	137	118	106

Client Sample ID			BH11_0.9-1.0	BH12_0.6-0.7	BH13_0.4-0.5	BH19_0.01-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071006	M23-Au0071007	M23-Au0071008	M23-Au0071009
Date Sampled			Aug 23, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C4-PFHpA (surr.)	1	%	64	121	108	114
13C8-PFOA (surr.)	1	%	71	133	121	126
13C5-PFNA (surr.)	1	%	88	143	128	134
13C6-PFDA (surr.)	1	%	64	123	116	115
13C2-PFUnDA (surr.)	1	%	58	110	98	107
13C2-PFDoDA (surr.)	1	%	65	134	121	124
13C2-PFTeDA (surr.)	1	%	34	112	109	112
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	%	69	137	124	125
D3-N-MeFOSA (surr.)	1	%	68	128	117	121
D5-N-EtFOSA (surr.)	1	%	68	146	127	131
D7-N-MeFOSE (surr.)	1	%	64	132	115	118
D9-N-EtFOSE (surr.)	1	%	58	138	123	120
D5-N-EtFOSAA (surr.)	1	%	83	138	126	136
D3-N-MeFOSAA (surr.)	1	%	73	123	110	112
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	[N09]8.6	< 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	[N09]37	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	6.1	[N09]14	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	78	142	127	130
18O2-PFHxS (surr.)	1	%	73	126	116	120
13C8-PFOS (surr.)	1	%	71	134	124	111
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	%	66	115	106	112
13C2-6:2 FTSA (surr.)	1	%	74	125	121	127
13C2-8:2 FTSA (surr.)	1	%	74	144	138	126
13C2-10:2 FTSA (surr.)	1	%	72	130	121	122

Client Sample ID			BH11_0.9-1.0	BH12_0.6-0.7	BH13_0.4-0.5	BH19_0.01-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071006	M23-Au0071007	M23-Au0071008	M23-Au0071009
Date Sampled			Aug 23, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	6.1	51	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	6.1	14	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	6.1	51	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	65.1	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	65.1	< 50	< 50

Client Sample ID			BH19_0.4-0.5	BH20_0.01-0.1	BH20_0.4-0.5	BH21_0.01-0.11
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071010	M23-Au0071011	M23-Au0071012	M23-Au0071013
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	18	17	17	16
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	%	126	89	131	107
13C5-PFPeA (surr.)	1	%	124	131	122	119
13C5-PFHxA (surr.)	1	%	120	114	120	115
13C4-PFHpA (surr.)	1	%	114	115	114	114
13C8-PFOA (surr.)	1	%	124	130	127	122
13C5-PFNA (surr.)	1	%	120	132	131	133
13C6-PFDA (surr.)	1	%	128	133	120	115
13C2-PFUnDA (surr.)	1	%	124	111	131	111
13C2-PFDoDA (surr.)	1	%	99	124	115	126
13C2-PFTeDA (surr.)	1	%	120	122	135	124
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			BH19_0.4-0.5	BH20_0.01-0.1	BH20_0.4-0.5	BH21_0.01-0.11
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071010	M23-Au0071011	M23-Au0071012	M23-Au0071013
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	114	130	111	123
D3-N-MeFOSA (surr.)	1	%	111	121	113	123
D5-N-EtFOSA (surr.)	1	%	119	134	124	133
D7-N-MeFOSE (surr.)	1	%	109	123	117	108
D9-N-EtFOSE (surr.)	1	%	98	127	109	113
D5-N-EtFOSAA (surr.)	1	%	117	134	122	129
D3-N-MeFOSAA (surr.)	1	%	115	124	118	115
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	117	133	126	153
18O2-PFHxS (surr.)	1	%	133	127	119	119
13C8-PFOS (surr.)	1	%	112	130	112	127
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	%	115	133	120	119
13C2-6:2 FTSA (surr.)	1	%	116	141	115	126
13C2-8:2 FTSA (surr.)	1	%	112	138	123	136
13C2-10:2 FTSA (surr.)	1	%	129	129	130	119
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH21_0.4-0.5	BH22_0.01-0.11	BH22_0.4-0.5	BH23_0.01-0.11
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071014	M23-Au0071015	M23-Au0071016	M23-Au0071017
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	16	17	18	18
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	%	126	100	105	107
13C5-PFPeA (surr.)	1	%	124	113	116	118
13C5-PFHxA (surr.)	1	%	117	131	134	109
13C4-PFHpA (surr.)	1	%	126	107	108	110
13C8-PFOA (surr.)	1	%	122	115	118	113
13C5-PFNA (surr.)	1	%	119	127	133	134
13C6-PFDA (surr.)	1	%	115	116	115	113
13C2-PFUnDA (surr.)	1	%	119	102	101	110
13C2-PFDoDA (surr.)	1	%	92	134	129	113
13C2-PFTeDA (surr.)	1	%	117	91	93	124
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	%	114	102	104	121
D3-N-MeFOSA (surr.)	1	%	115	114	111	117
D5-N-EtFOSA (surr.)	1	%	120	121	120	124
D7-N-MeFOSE (surr.)	1	%	104	109	110	107
D9-N-EtFOSE (surr.)	1	%	97	98	102	116
D5-N-EtFOSAA (surr.)	1	%	117	117	128	136
D3-N-MeFOSAA (surr.)	1	%	114	123	121	116
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			BH21_0.4-0.5	BH22_0.01-0.11	BH22_0.4-0.5	BH23_0.01-0.11
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071014	M23-Au0071015	M23-Au0071016	M23-Au0071017
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	121	123	121	132
18O2-PFHxS (surr.)	1	%	119	106	107	122
13C8-PFOS (surr.)	1	%	113	116	120	121
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	%	117	73	75	110
13C2-6:2 FTSA (surr.)	1	%	110	80	81	126
13C2-8:2 FTSA (surr.)	1	%	120	120	129	133
13C2-10:2 FTSA (surr.)	1	%	124	129	132	120
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH23_0.2-0.32	BH24_0.5-0.6	BH25_0.4-0.5	BH26_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071018	M23-Au0071019	M23-Au0071020	M23-Au0071021
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	25	18	24	24
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	%	62	54	89	98
13C5-PFPeA (surr.)	1	%	66	60	94	106
13C5-PFHxA (surr.)	1	%	80	75	106	123

Client Sample ID			BH23_0.2-0.32	BH24_0.5-0.6	BH25_0.4-0.5	BH26_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071018	M23-Au0071019	M23-Au0071020	M23-Au0071021
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C4-PFHpA (surr.)	1	%	62	59	91	97
13C8-PFOA (surr.)	1	%	67	61	97	114
13C5-PFNA (surr.)	1	%	76	64	100	113
13C6-PFDA (surr.)	1	%	78	59	95	101
13C2-PFUnDA (surr.)	1	%	65	52	93	102
13C2-PFDoDA (surr.)	1	%	73	62	98	102
13C2-PFTeDA (surr.)	1	%	37	25	45	47
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	%	62	53	88	94
D3-N-MeFOSA (surr.)	1	%	67	56	96	99
D5-N-EtFOSA (surr.)	1	%	61	50	90	97
D7-N-MeFOSE (surr.)	1	%	61	55	90	97
D9-N-EtFOSE (surr.)	1	%	53	42	70	76
D5-N-EtFOSAA (surr.)	1	%	67	60	115	129
D3-N-MeFOSAA (surr.)	1	%	69	60	107	123
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	[N09]220
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	80	70	101	117
18O2-PFHxS (surr.)	1	%	67	51	96	105
13C8-PFOS (surr.)	1	%	75	61	103	103
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	%	45	38	65	75
13C2-6:2 FTSA (surr.)	1	%	44	37	69	83
13C2-8:2 FTSA (surr.)	1	%	77	59	99	110
13C2-10:2 FTSA (surr.)	1	%	70	53	109	115

Client Sample ID			BH23_0.2-0.32	BH24_0.5-0.6	BH25_0.4-0.5	BH26_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071018	M23-Au0071019	M23-Au0071020	M23-Au0071021
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	220
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	220
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	220
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	220
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	220

Client Sample ID			BH27_0.01-0.11	BH27_0.4-0.45	BH28_0.01-0.11	BH28_0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071022	M23-Au0071023	M23-Au0071024	M23-Au0071025
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	10.0	18	16	26
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	%	108	95	127	126
13C5-PFPeA (surr.)	1	%	112	118	127	121
13C5-PFHxA (surr.)	1	%	128	131	129	125
13C4-PFHpA (surr.)	1	%	118	109	109	111
13C8-PFOA (surr.)	1	%	110	115	115	132
13C5-PFNA (surr.)	1	%	110	126	123	123
13C6-PFDA (surr.)	1	%	107	117	115	119
13C2-PFUnDA (surr.)	1	%	102	108	123	124
13C2-PFDoDA (surr.)	1	%	100	116	118	105
13C2-PFTeDA (surr.)	1	%	46	102	127	125
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			BH27_0.01-0.11	BH27_0.4-0.45	BH28_0.01-0.11	BH28_0.2-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071022	M23-Au0071023	M23-Au0071024	M23-Au0071025
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	85	102	110	108
D3-N-MeFOSA (surr.)	1	%	103	107	112	109
D5-N-EtFOSA (surr.)	1	%	91	120	124	119
D7-N-MeFOSE (surr.)	1	%	95	104	103	105
D9-N-EtFOSE (surr.)	1	%	62	94	101	98
D5-N-EtFOSAA (surr.)	1	%	89	108	113	112
D3-N-MeFOSAA (surr.)	1	%	87	107	111	103
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]14	5.7	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	124	121	122	123
18O2-PFHxS (surr.)	1	%	109	116	124	119
13C8-PFOS (surr.)	1	%	108	119	113	116
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	%	85	82	122	121
13C2-6:2 FTSA (surr.)	1	%	87	82	127	118
13C2-8:2 FTSA (surr.)	1	%	108	126	119	117
13C2-10:2 FTSA (surr.)	1	%	89	112	124	121
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	14	5.7	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	14	5.7	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	14	5.7	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	14	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH29_0.01-0.06	BH29_0.25-0.3	BH30_0.01-0.11	BH30_0.25-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071026	M23-Au0071027	M23-Au0071028	M23-Au0071029
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	11	12	13	17
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 6	< 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	%	68	105	129	135
13C5-PFPeA (surr.)	1	%	65	119	128	129
13C5-PFHxA (surr.)	1	%	71	122	132	129
13C4-PFHpA (surr.)	1	%	63	109	119	122
13C8-PFOA (surr.)	1	%	69	122	130	129
13C5-PFNA (surr.)	1	%	69	119	125	128
13C6-PFDA (surr.)	1	%	66	110	115	127
13C2-PFUnDA (surr.)	1	%	72	122	125	129
13C2-PFDoDA (surr.)	1	%	65	87	95	98
13C2-PFTeDA (surr.)	1	%	62	106	124	124
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	%	63	111	116	117
D3-N-MeFOSA (surr.)	1	%	61	114	116	121
D5-N-EtFOSA (surr.)	1	%	64	122	127	125
D7-N-MeFOSE (surr.)	1	%	62	107	112	117
D9-N-EtFOSE (surr.)	1	%	57	101	104	103
D5-N-EtFOSAA (surr.)	1	%	60	101	128	115
D3-N-MeFOSAA (surr.)	1	%	56	103	123	114
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			BH29_0.01-0.06	BH29_0.25-0.3	BH30_0.01-0.11	BH30_0.25-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071026	M23-Au0071027	M23-Au0071028	M23-Au0071029
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	67	117	124	128
18O2-PFHxS (surr.)	1	%	66	117	127	124
13C8-PFOS (surr.)	1	%	64	110	114	118
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	%	68	114	121	131
13C2-6:2 FTSA (surr.)	1	%	60	109	131	123
13C2-8:2 FTSA (surr.)	1	%	67	118	125	128
13C2-10:2 FTSA (surr.)	1	%	62	108	128	135
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH31_0.25-0.35	BH31_0.4-0.5	BH32_0.01-0.11	BH32_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071030	M23-Au0071031	M23-Au0071032	M23-Au0071033
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	16	25	11	8.1
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	%	100	101	99	101
13C5-PFPeA (surr.)	1	%	108	105	105	106
13C5-PFHxA (surr.)	1	%	115	114	114	114

Client Sample ID			BH31_0.25-0.35	BH31_0.4-0.5	BH32_0.01-0.11	BH32_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071030	M23-Au0071031	M23-Au0071032	M23-Au0071033
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C4-PFHpA (surr.)	1	%	101	97	98	99
13C8-PFOA (surr.)	1	%	98	98	101	102
13C5-PFNA (surr.)	1	%	97	100	98	101
13C6-PFDA (surr.)	1	%	107	110	103	109
13C2-PFUnDA (surr.)	1	%	71	82	73	80
13C2-PFDoDA (surr.)	1	%	64	79	77	74
13C2-PFTeDA (surr.)	1	%	98	106	93	89
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	%	70	78	79	80
D3-N-MeFOSA (surr.)	1	%	100	104	108	106
D5-N-EtFOSA (surr.)	1	%	106	106	107	111
D7-N-MeFOSE (surr.)	1	%	73	81	86	77
D9-N-EtFOSE (surr.)	1	%	84	85	81	85
D5-N-EtFOSAA (surr.)	1	%	105	123	119	118
D3-N-MeFOSAA (surr.)	1	%	67	126	121	87
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	104	103	101	104
18O2-PFHxS (surr.)	1	%	100	98	94	99
13C8-PFOS (surr.)	1	%	78	73	71	83
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	109	104	106
13C2-6:2 FTSA (surr.)	1	%	90	96	93	94
13C2-8:2 FTSA (surr.)	1	%	138	144	137	128
13C2-10:2 FTSA (surr.)	1	%	111	110	111	109

Client Sample ID			BH31_0.25-0.35	BH31_0.4-0.5	BH32_0.01-0.11	BH32_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071030	M23-Au0071031	M23-Au0071032	M23-Au0071033
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH33_0.4-0.5	BH34_0.01-0.05	BH34_0.4-0.5	BH35_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071034	M23-Au0071035	M23-Au0071036	M23-Au0071037
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	11	11	18	23
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	%	101	99	99	92
13C5-PFPeA (surr.)	1	%	109	105	106	99
13C5-PFHxA (surr.)	1	%	112	110	113	103
13C4-PFHpA (surr.)	1	%	96	94	98	93
13C8-PFOA (surr.)	1	%	102	96	102	95
13C5-PFNA (surr.)	1	%	100	95	102	91
13C6-PFDA (surr.)	1	%	103	103	106	97
13C2-PFUnDA (surr.)	1	%	74	71	89	80
13C2-PFDoDA (surr.)	1	%	94	62	97	89
13C2-PFTeDA (surr.)	1	%	106	90	105	97
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

Client Sample ID			BH33_0.4-0.5	BH34_0.01-0.05	BH34_0.4-0.5	BH35_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071034	M23-Au0071035	M23-Au0071036	M23-Au0071037
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	82	70	78	72
D3-N-MeFOSA (surr.)	1	%	102	101	107	99
D5-N-EtFOSA (surr.)	1	%	107	104	108	99
D7-N-MeFOSE (surr.)	1	%	91	75	95	81
D9-N-EtFOSE (surr.)	1	%	91	77	91	89
D5-N-EtFOSAA (surr.)	1	%	143	103	136	137
D3-N-MeFOSAA (surr.)	1	%	129	78	134	133
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	[N09]7.6
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	100	98	101	93
18O2-PFHxS (surr.)	1	%	101	91	98	94
13C8-PFOS (surr.)	1	%	74	72	78	71
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	109	100	86
13C2-6:2 FTSA (surr.)	1	%	99	94	99	93
13C2-8:2 FTSA (surr.)	1	%	132	124	118	116
13C2-10:2 FTSA (surr.)	1	%	124	93	142	120
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	7.6
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	7.6
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	7.6
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH36_0.01-0.1	BH36_0.4-0.5	BH37_0.01-0.1	BH37_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071038	M23-Au0071039	M23-Au0071040	M23-Au0071041
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	16	17	6.9	13
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	%	102	98	102	99
13C5-PFPeA (surr.)	1	%	107	103	102	101
13C5-PFHxA (surr.)	1	%	112	105	118	114
13C4-PFHpA (surr.)	1	%	95	89	97	93
13C8-PFOA (surr.)	1	%	100	97	104	106
13C5-PFNA (surr.)	1	%	95	96	102	99
13C6-PFDA (surr.)	1	%	101	101	110	105
13C2-PFUnDA (surr.)	1	%	79	76	77	82
13C2-PFDoDA (surr.)	1	%	91	94	85	89
13C2-PFTeDA (surr.)	1	%	104	102	104	103
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	%	81	76	80	76
D3-N-MeFOSA (surr.)	1	%	102	99	109	114
D5-N-EtFOSA (surr.)	1	%	104	104	129	128
D7-N-MeFOSE (surr.)	1	%	78	86	80	113
D9-N-EtFOSE (surr.)	1	%	89	90	88	89
D5-N-EtFOSAA (surr.)	1	%	131	139	116	108
D3-N-MeFOSAA (surr.)	1	%	133	130	100	103
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			BH36_0.01-0.1	BH36_0.4-0.5	BH37_0.01-0.1	BH37_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071038	M23-Au0071039	M23-Au0071040	M23-Au0071041
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]11	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	101	94	101	103
18O2-PFHxS (surr.)	1	%	93	93	95	95
13C8-PFOS (surr.)	1	%	72	78	72	71
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	%	92	86	102	88
13C2-6:2 FTSA (surr.)	1	%	92	77	99	97
13C2-8:2 FTSA (surr.)	1	%	120	114	137	131
13C2-10:2 FTSA (surr.)	1	%	119	132	99	104
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	11	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	11	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	11	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	11	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH38_0.0-0.1	BH38-0.4-0.5	BH39_0.0-0.05	BH39_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071042	M23-Au0071043	M23-Au0071044	M23-Au0071045
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	8.3	15	6.8	18
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	%	101	96	104	105
13C5-PFPeA (surr.)	1	%	103	97	107	107
13C5-PFHxA (surr.)	1	%	116	109	117	122
13C4-PFHpA (surr.)	1	%	96	94	100	98

Client Sample ID			BH38_0.0-0.1	BH38-0.4-0.5	BH39_0.0-0.05	BH39_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071042	M23-Au0071043	M23-Au0071044	M23-Au0071045
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C8-PFOA (surr.)	1	%	104	103	108	109
13C5-PFNA (surr.)	1	%	102	102	102	103
13C6-PFDA (surr.)	1	%	101	104	113	108
13C2-PFUnDA (surr.)	1	%	91	91	89	91
13C2-PFDoDA (surr.)	1	%	79	94	91	90
13C2-PFTeDA (surr.)	1	%	99	95	102	107
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	%	77	83	83	79
D3-N-MeFOSA (surr.)	1	%	111	105	113	117
D5-N-EtFOSA (surr.)	1	%	130	127	133	132
D7-N-MeFOSE (surr.)	1	%	99	97	95	93
D9-N-EtFOSE (surr.)	1	%	90	91	92	95
D5-N-EtFOSAA (surr.)	1	%	96	102	102	124
D3-N-MeFOSAA (surr.)	1	%	85	100	112	116
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	108	102	106	113
18O2-PFHxS (surr.)	1	%	100	91	101	106
13C8-PFOS (surr.)	1	%	82	80	81	74
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	%	87	90	86	97
13C2-6:2 FTSA (surr.)	1	%	93	105	105	89
13C2-8:2 FTSA (surr.)	1	%	117	110	118	123
13C2-10:2 FTSA (surr.)	1	%	110	107	119	122

Client Sample ID			BH38_0.0-0.1	BH38-0.4-0.5	BH39_0.0-0.05	BH39_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071042	M23-Au0071043	M23-Au0071044	M23-Au0071045
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH40_0.0-0.1	BH40_0.4-0.5	BH41_0.01-0.1	BH41_0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071046	M23-Au0071047	M23-Au0071048	M23-Au0071049
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	7.2	7.3	18	12
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	104	100	90
13C5-PFPeA (surr.)	1	%	108	107	104	98
13C5-PFHxA (surr.)	1	%	117	119	113	107
13C4-PFHpA (surr.)	1	%	100	97	95	90
13C8-PFOA (surr.)	1	%	109	108	104	101
13C5-PFNA (surr.)	1	%	106	105	103	94
13C6-PFDA (surr.)	1	%	112	109	104	107
13C2-PFUnDA (surr.)	1	%	84	90	86	88
13C2-PFDoDA (surr.)	1	%	96	95	91	95
13C2-PFTeDA (surr.)	1	%	110	106	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

Client Sample ID			BH40_0.0-0.1	BH40_0.4-0.5	BH41_0.01-0.1	BH41_0.9-1.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071046	M23-Au0071047	M23-Au0071048	M23-Au0071049
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	81	88	81	78
D3-N-MeFOSA (surr.)	1	%	114	119	104	109
D5-N-EtFOSA (surr.)	1	%	128	132	121	122
D7-N-MeFOSE (surr.)	1	%	92	87	74	89
D9-N-EtFOSE (surr.)	1	%	95	94	90	92
D5-N-EtFOSAA (surr.)	1	%	109	106	109	108
D3-N-MeFOSAA (surr.)	1	%	105	108	100	90
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	107	107	102	100
18O2-PFHxS (surr.)	1	%	101	98	97	91
13C8-PFOS (surr.)	1	%	78	86	77	72
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	%	103	89	105	83
13C2-6:2 FTSA (surr.)	1	%	103	92	86	94
13C2-8:2 FTSA (surr.)	1	%	125	114	120	105
13C2-10:2 FTSA (surr.)	1	%	121	130	115	97
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH42_0.0-0.1	BH42_0.4-0.5	BH43_0.01-0.1	BH43_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071050	M23-Au0071051	M23-Au0071052	M23-Au0071053
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	13	9.9	12	11
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	%	100	95	99	86
13C5-PFPeA (surr.)	1	%	103	106	105	93
13C5-PFHxA (surr.)	1	%	113	112	111	104
13C4-PFHpA (surr.)	1	%	97	97	94	88
13C8-PFOA (surr.)	1	%	97	107	104	99
13C5-PFNA (surr.)	1	%	91	101	96	94
13C6-PFDA (surr.)	1	%	98	115	111	109
13C2-PFUnDA (surr.)	1	%	55	93	78	87
13C2-PFDoDA (surr.)	1	%	44	104	82	88
13C2-PFTeDA (surr.)	1	%	65	106	56	82
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	%	62	85	81	82
D3-N-MeFOSA (surr.)	1	%	102	119	111	111
D5-N-EtFOSA (surr.)	1	%	120	130	122	122
D7-N-MeFOSE (surr.)	1	%	66	99	65	91
D9-N-EtFOSE (surr.)	1	%	68	105	88	94
D5-N-EtFOSAA (surr.)	1	%	57	119	105	100
D3-N-MeFOSAA (surr.)	1	%	29	113	81	92
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			BH42_0.0-0.1	BH42_0.4-0.5	BH43_0.01-0.1	BH43_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071050	M23-Au0071051	M23-Au0071052	M23-Au0071053
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	95	107	96	93
18O2-PFHxS (surr.)	1	%	83	102	90	89
13C8-PFOS (surr.)	1	%	77	78	75	72
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	%	100	98	91	78
13C2-6:2 FTSA (surr.)	1	%	93	99	95	89
13C2-8:2 FTSA (surr.)	1	%	98	115	114	105
13C2-10:2 FTSA (surr.)	1	%	50	131	83	106
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH44_0.0-0.1	BH44_0.4-0.5	BH45_0.0-0.05	BH45_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071054	M23-Au0071055	M23-Au0071056	M23-Au0071057
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	13	25	19	12
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	%	97	99	95	100
13C5-PFPeA (surr.)	1	%	101	106	103	103
13C5-PFHxA (surr.)	1	%	108	109	111	114
13C4-PFHpA (surr.)	1	%	90	93	92	94

Client Sample ID			BH44_0.0-0.1	BH44_0.4-0.5	BH45_0.0-0.05	BH45_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071054	M23-Au0071055	M23-Au0071056	M23-Au0071057
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C8-PFOA (surr.)	1	%	99	102	100	106
13C5-PFNA (surr.)	1	%	93	99	89	99
13C6-PFDA (surr.)	1	%	106	106	85	107
13C2-PFUnDA (surr.)	1	%	92	85	55	91
13C2-PFDoDA (surr.)	1	%	86	94	37	104
13C2-PFTeDA (surr.)	1	%	92	108	77	103
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	%	79	80	58	84
D3-N-MeFOSA (surr.)	1	%	108	103	93	109
D5-N-EtFOSA (surr.)	1	%	117	112	107	121
D7-N-MeFOSE (surr.)	1	%	76	90	62	102
D9-N-EtFOSE (surr.)	1	%	89	88	70	97
D5-N-EtFOSAA (surr.)	1	%	110	119	44	106
D3-N-MeFOSAA (surr.)	1	%	102	100	31	99
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	95	100	100	101
18O2-PFHxS (surr.)	1	%	95	95	87	100
13C8-PFOS (surr.)	1	%	75	76	71	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	%	92	89	138	97
13C2-6:2 FTSA (surr.)	1	%	101	84	126	100
13C2-8:2 FTSA (surr.)	1	%	104	116	113	107
13C2-10:2 FTSA (surr.)	1	%	109	106	58	115

Client Sample ID			BH44_0.0-0.1	BH44_0.4-0.5	BH45_0.0-0.05	BH45_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071054	M23-Au0071055	M23-Au0071056	M23-Au0071057
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH46_0.0-0.1	BH46_0.4-0.5	BH47_0.0-0.1	BH47_0.45-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071058	M23-Au0071059	M23-Au0071060	M23-Au0071061
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	16	22	15	18
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	%	94	95	98	101
13C5-PFPeA (surr.)	1	%	99	98	103	105
13C5-PFHxA (surr.)	1	%	111	110	109	112
13C4-PFHpA (surr.)	1	%	93	90	91	94
13C8-PFOA (surr.)	1	%	102	100	103	106
13C5-PFNA (surr.)	1	%	95	97	95	100
13C6-PFDA (surr.)	1	%	101	104	107	112
13C2-PFUnDA (surr.)	1	%	83	96	86	81
13C2-PFDoDA (surr.)	1	%	88	94	95	92
13C2-PFTeDA (surr.)	1	%	102	95	102	109
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			BH46_0.0-0.1	BH46_0.4-0.5	BH47_0.0-0.1	BH47_0.45-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071058	M23-Au0071059	M23-Au0071060	M23-Au0071061
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	71	78	76	75
D3-N-MeFOSA (surr.)	1	%	109	102	109	105
D5-N-EtFOSA (surr.)	1	%	119	118	120	118
D7-N-MeFOSE (surr.)	1	%	85	92	100	94
D9-N-EtFOSE (surr.)	1	%	93	94	95	92
D5-N-EtFOSAA (surr.)	1	%	102	107	104	126
D3-N-MeFOSAA (surr.)	1	%	96	103	94	114
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	99	96	102	103
18O2-PFHxS (surr.)	1	%	92	94	90	100
13C8-PFOS (surr.)	1	%	70	82	79	66
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	%	87	81	84	88
13C2-6:2 FTSA (surr.)	1	%	105	99	106	98
13C2-8:2 FTSA (surr.)	1	%	111	102	107	124
13C2-10:2 FTSA (surr.)	1	%	118	116	117	125
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			SED01	SED02	SED03	FD01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071062	M23-Au0071063	M23-Au0071064	M23-Au0071065
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 23, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	34	31	24	19
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	%	94	99	100	101
13C5-PFPeA (surr.)	1	%	98	102	102	106
13C5-PFHxA (surr.)	1	%	110	111	110	109
13C4-PFHpA (surr.)	1	%	92	93	92	97
13C8-PFOA (surr.)	1	%	101	102	104	105
13C5-PFNA (surr.)	1	%	94	92	101	101
13C6-PFDA (surr.)	1	%	100	105	112	111
13C2-PFUnDA (surr.)	1	%	86	88	90	91
13C2-PFDoDA (surr.)	1	%	89	91	94	103
13C2-PFTeDA (surr.)	1	%	96	105	72	111
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	%	79	76	80	79
D3-N-MeFOSA (surr.)	1	%	94	99	107	104
D5-N-EtFOSA (surr.)	1	%	107	113	119	124
D7-N-MeFOSE (surr.)	1	%	78	91	91	105
D9-N-EtFOSE (surr.)	1	%	89	96	91	98
D5-N-EtFOSAA (surr.)	1	%	107	100	111	116
D3-N-MeFOSAA (surr.)	1	%	95	98	101	106
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			SED01	SED02	SED03	FD01
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071062	M23-Au0071063	M23-Au0071064	M23-Au0071065
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 23, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	100	104	96	102
18O2-PFHxS (surr.)	1	%	89	96	95	94
13C8-PFOS (surr.)	1	%	69	77	77	75
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	%	92	102	91	94
13C2-6:2 FTSA (surr.)	1	%	112	107	107	107
13C2-8:2 FTSA (surr.)	1	%	115	116	113	116
13C2-10:2 FTSA (surr.)	1	%	128	129	105	136
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			FD02	FD03	FD04	FD05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071066	M23-Au0071067	M23-Au0071068	M23-Au0071069
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	15	17	24	21
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	10	< 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	%	84	95	99	101
13C5-PFPeA (surr.)	1	%	91	100	104	108
13C5-PFHxA (surr.)	1	%	98	106	112	119
13C4-PFHpA (surr.)	1	%	86	91	93	96

Client Sample ID			FD02	FD03	FD04	FD05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071066	M23-Au0071067	M23-Au0071068	M23-Au0071069
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C8-PFOA (surr.)	1	%	95	102	102	110
13C5-PFNA (surr.)	1	%	91	95	98	101
13C6-PFDA (surr.)	1	%	99	100	93	105
13C2-PFUnDA (surr.)	1	%	88	85	66	73
13C2-PFDoDA (surr.)	1	%	88	90	81	82
13C2-PFTeDA (surr.)	1	%	91	97	99	103
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	%	75	76	76	75
D3-N-MeFOSA (surr.)	1	%	105	105	98	101
D5-N-EtFOSA (surr.)	1	%	114	113	114	114
D7-N-MeFOSE (surr.)	1	%	87	90	84	82
D9-N-EtFOSE (surr.)	1	%	90	90	85	85
D5-N-EtFOSAA (surr.)	1	%	107	102	114	123
D3-N-MeFOSAA (surr.)	1	%	88	113	98	91
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	[N09]15	< 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	[N09]8.2	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]48	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]12	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	88	91	96	101
18O2-PFHxS (surr.)	1	%	83	93	94	94
13C8-PFOS (surr.)	1	%	70	69	56	54
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	%	79	93	95	100
13C2-6:2 FTSA (surr.)	1	%	88	111	108	112
13C2-8:2 FTSA (surr.)	1	%	96	116	142	144
13C2-10:2 FTSA (surr.)	1	%	111	112	95	110

Client Sample ID			FD02	FD03	FD04	FD05
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071066	M23-Au0071067	M23-Au0071068	M23-Au0071069
Date Sampled			Aug 24, 2023	Aug 24, 2023	Aug 24, 2023	Aug 24, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	60	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	12	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	60	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	85	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	93.2	< 50	< 50	< 50

Client Sample ID			FD06	FD07	FD08
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071070	M23-Au0071071	M23-Au0071072
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit			
Sample Properties					
% Moisture	1	%	10	14	27
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	100	83	91
13C5-PFPeA (surr.)	1	%	103	91	100
13C5-PFHxA (surr.)	1	%	108	98	110
13C4-PFHpA (surr.)	1	%	93	86	92
13C8-PFOA (surr.)	1	%	106	100	102
13C5-PFNA (surr.)	1	%	101	90	95
13C6-PFDA (surr.)	1	%	102	103	102
13C2-PFUnDA (surr.)	1	%	89	91	82
13C2-PFDoDA (surr.)	1	%	94	96	77
13C2-PFTeDA (surr.)	1	%	103	97	94
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10

Client Sample ID			FD06	FD07	FD08
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M23-Au0071070	M23-Au0071071	M23-Au0071072
Date Sampled			Aug 25, 2023	Aug 25, 2023	Aug 25, 2023
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonamido substances					
13C8-FOSA (surr.)	1	%	85	76	78
D3-N-MeFOSA (surr.)	1	%	110	102	102
D5-N-EtFOSA (surr.)	1	%	118	116	116
D7-N-MeFOSE (surr.)	1	%	75	82	84
D9-N-EtFOSE (surr.)	1	%	92	93	90
D5-N-EtFOSAA (surr.)	1	%	109	100	104
D3-N-MeFOSAA (surr.)	1	%	105	97	88
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	99	95	96
18O2-PFHxS (surr.)	1	%	96	95	94
13C8-PFOS (surr.)	1	%	75	71	68
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	93	61	85
13C2-6:2 FTSA (surr.)	1	%	100	93	103
13C2-8:2 FTSA (surr.)	1	%	110	111	112
13C2-10:2 FTSA (surr.)	1	%	119	115	96
PFASs Summations					
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Aug 28, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Aug 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Aug 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Aug 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Aug 31, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Aug 28, 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
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Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1020822
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Aug 28, 2023 1:46 PM
Due: Sep 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH14_0.4-0.5	Aug 23, 2023		Soil	M23-Au0070998		X	X
2	BH15_0.4-0.5	Aug 23, 2023		Soil	M23-Au0070999		X	X
3	BH16_0.1-0.2	Aug 23, 2023		Soil	M23-Au0071000		X	X
4	BH16_0.4-0.6	Aug 23, 2023		Soil	M23-Au0071001		X	X
5	BH17_0.25-0.42	Aug 23, 2023		Soil	M23-Au0071002		X	X
6	BH18_0.9-1.0	Aug 23, 2023		Soil	M23-Au0071003		X	X
7	BH09_0.9-1.0	Aug 23, 2023		Soil	M23-Au0071004		X	X
8	BH10_0.4-0.5	Aug 23, 2023		Soil	M23-Au0071005		X	X
9	BH11_0.9-1.0	Aug 23, 2023		Soil	M23-Au0071006		X	X
10	BH12_0.6-0.7	Aug 24, 2023		Soil	M23-Au0071007		X	X
11	BH13_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071008		X	X
12	BH19_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071009		X	X

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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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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 Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1020822
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Aug 28, 2023 1:46 PM
Due: Sep 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
13	BH19_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071010		X	X
14	BH20_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071011		X	X
15	BH20_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071012		X	X
16	BH21_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071013		X	X
17	BH21_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071014		X	X
18	BH22_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071015		X	X
19	BH22_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071016		X	X
20	BH23_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071017		X	X
21	BH23_0.2-0.32	Aug 24, 2023		Soil	M23-Au0071018		X	X
22	BH24_0.5-0.6	Aug 24, 2023		Soil	M23-Au0071019		X	X
23	BH25_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071020		X	X
24	BH26_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071021		X	X
25	BH27_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071022		X	X

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Received: Aug 28, 2023 1:46 PM
Due: Sep 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
26	BH27_0.4-0.45	Aug 24, 2023		Soil	M23-Au0071023		X	X
27	BH28_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071024		X	X
28	BH28_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071025		X	X
29	BH29_0.01-0.06	Aug 24, 2023		Soil	M23-Au0071026		X	X
30	BH29_0.25-0.3	Aug 24, 2023		Soil	M23-Au0071027		X	X
31	BH30_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071028		X	X
32	BH30_0.25-0.3	Aug 24, 2023		Soil	M23-Au0071029		X	X
33	BH31_0.25-0.35	Aug 24, 2023		Soil	M23-Au0071030		X	X
34	BH31_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071031		X	X
35	BH32_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071032		X	X
36	BH32_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071033		X	X
37	BH33_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071034		X	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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Order No.:
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Received: Aug 28, 2023 1:46 PM
Due: Sep 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
38	BH34_0.01-0.05	Aug 25, 2023		Soil	M23-Au0071035		X	X
39	BH34_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071036		X	X
40	BH35_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071037		X	X
41	BH36_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071038		X	X
42	BH36_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071039		X	X
43	BH37_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071040		X	X
44	BH37_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071041		X	X
45	BH38_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071042		X	X
46	BH38-0.4-0.5	Aug 25, 2023		Soil	M23-Au0071043		X	X
47	BH39_0.0-0.05	Aug 25, 2023		Soil	M23-Au0071044		X	X
48	BH39_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071045		X	X
49	BH40_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071046		X	X
50	BH40_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071047		X	X
51	BH41_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071048		X	X
52	BH41_0.9-1.0	Aug 25, 2023		Soil	M23-Au0071049		X	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 Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
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Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Aug 28, 2023 1:46 PM
Due: Sep 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
53	BH42_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071050		X	X
54	BH42_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071051		X	X
55	BH43_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071052		X	X
56	BH43_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071053		X	X
57	BH44_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071054		X	X
58	BH44_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071055		X	X
59	BH45_0.0-0.05	Aug 25, 2023		Soil	M23-Au0071056		X	X
60	BH45_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071057		X	X
61	BH46_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071058		X	X
62	BH46_0.4-0.5	Aug 25, 2023		Soil	M23-Au0071059		X	X
63	BH47_0.0-0.1	Aug 25, 2023		Soil	M23-Au0071060		X	X
64	BH47_0.45-0.5	Aug 25, 2023		Soil	M23-Au0071061		X	X
65	SED01	Aug 24, 2023		Soil	M23-Au0071062		X	X
66	SED02	Aug 24, 2023		Soil	M23-Au0071063		X	X
67	SED03	Aug 24, 2023		Soil	M23-Au0071064		X	X
68	FD01	Aug 23, 2023		Soil	M23-Au0071065		X	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 Name: MFS Oakden DSI
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Received: Aug 28, 2023 1:46 PM
Due: Sep 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
69	FD02	Aug 24, 2023		Soil	M23-Au0071066		X	X
70	FD03	Aug 24, 2023		Soil	M23-Au0071067		X	X
71	FD04	Aug 24, 2023		Soil	M23-Au0071068		X	X
72	FD05	Aug 24, 2023		Soil	M23-Au0071069		X	X
73	FD06	Aug 25, 2023		Soil	M23-Au0071070		X	X
74	FD07	Aug 25, 2023		Soil	M23-Au0071071		X	X
75	FD08	Aug 25, 2023		Soil	M23-Au0071072		X	X
76	RB01A	Aug 23, 2023		Water	M23-Au0071073			X
77	RB01B	Aug 23, 2023		Water	M23-Au0071074			X
78	RB02A	Aug 24, 2023		Water	M23-Au0071075			X
79	RB03A	Aug 25, 2023		Water	M23-Au0071076			X
80	BH14_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071077	X		
81	BH14_0.1-0.15	Aug 23, 2023		Soil	M23-Au0071078	X		
82	BH14_0.2-0.3	Aug 23, 2023		Soil	M23-Au0071079	X		
83	BH15_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071080	X		
84	BH15_0.1-0.2	Aug 23, 2023		Soil	M23-Au0071081	X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
85	BH15_0.2-0.4	Aug 23, 2023		Soil	M23-Au0071082	X		
86	BH16_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071083	X		
87	BH17_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071084	X		
88	BH17_0.1-0.25	Aug 23, 2023		Soil	M23-Au0071085	X		
89	BH18_0.01-0.15	Aug 23, 2023		Soil	M23-Au0071086	X		
90	BH18_0.15-0.25	Aug 23, 2023		Soil	M23-Au0071087	X		
91	BH18_0.25-0.35	Aug 23, 2023		Soil	M23-Au0071088	X		
92	BH09_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071089	X		
93	BH09_0.2-0.3	Aug 23, 2023		Soil	M23-Au0071090	X		
94	BH09_0.4-0.5	Aug 23, 2023		Soil	M23-Au0071091	X		
95	BH10_0.01-0.1	Aug 23, 2023		Soil	M23-Au0071092	X		
96	BH10_0.2-0.3	Aug 23, 2023		Soil	M23-Au0071093	X		
97	BH11_0.0-0.1	Aug 23, 2023		Soil	M23-Au0071094	X		
98	BH11_0.25-	Aug 23, 2023		Soil	M23-Au0071095	X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
	0.35							
99	BH12_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071096	X		
100	BH12_0.4-0.5	Aug 24, 2023		Soil	M23-Au0071097	X		
101	BH13_0.01-0.1	Aug 24, 2023		Soil	M23-Au0071098	X		
102	BH13_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071100	X		
103	BH19_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071101	X		
104	BH20_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071102	X		
105	BH21_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071103	X		
106	BH22_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071104	X		
107	BH23_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071105	X		
108	BH24_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071106	X		
109	BH24_0.25-0.35	Aug 24, 2023		Soil	M23-Au0071107	X		
110	BH25_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071108	X		
111	BH25_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071109	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
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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IANZ# 1327	IANZ# 1290	IANZ# 1402

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

Project Name: MFS Oakden DSI
Project ID: 12611126

Order No.:
Report #: 1020822
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Aug 28, 2023 1:46 PM
Due: Sep 4, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
112	BH26_0.01-0.06	Aug 24, 2023		Soil	M23-Au0071110	X		
113	BH26_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071111	X		
114	BH27_0.3-0.4	Aug 24, 2023		Soil	M23-Au0071112	X		
115	BH29_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071113	X		
116	BH30_0.1-0.2	Aug 24, 2023		Soil	M23-Au0071114	X		
117	BH31_0.01-0.11	Aug 24, 2023		Soil	M23-Au0071115	X		
118	BH32_0.2-0.3	Aug 24, 2023		Soil	M23-Au0071116	X		
119	BH33_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071117	X		
120	BH33_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071118	X		
121	BH34_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071119	X		
122	BH35_0.01-0.1	Aug 25, 2023		Soil	M23-Au0071120	X		
123	BH36_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071121	X		
124	BH37_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071122	X		
125	BH38_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071123	X		

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Eurofins Environment Testing Australia Pty Ltd
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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
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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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Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
126	BH39_0.05-0.1	Aug 25, 2023		Soil	M23-Au0071124	X		
127	BH39_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071125	X		
128	BH40_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071126	X		
129	BH41_0.45-0.55	Aug 25, 2023		Soil	M23-Au0071127	X		
130	BH42_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071128	X		
131	BH43_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071129	X		
132	BH44_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071130	X		
133	BH45_0.1-0.15	Aug 25, 2023		Soil	M23-Au0071131	X		
134	BH45_0.2-0.24	Aug 25, 2023		Soil	M23-Au0071132	X		
135	BH46_0.2-0.3	Aug 25, 2023		Soil	M23-Au0071133	X		
136	BH47_0.15-0.25	Aug 25, 2023		Soil	M23-Au0071134	X		
137	BH47_0.35-0.45	Aug 25, 2023		Soil	M23-Au0071135	X		
Test Counts						58	75	79

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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)	%	100			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	77			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	96			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	89			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	93			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	100			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	95			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	135			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	112			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	129			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	91			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	100			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	111			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	100			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	105			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	96			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	80			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	96			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	89			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	100			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	78			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	77			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	93			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	98			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	97			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	100			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	91			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	98			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-Au0071006	CP	%	102			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Au0071006	CP	%	65			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Au0071006	CP	%	96			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Au0071006	CP	%	101			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Au0071006	CP	%	93			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Au0071006	CP	%	103			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Au0071006	CP	%	99			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Au0071006	CP	%	125			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Au0071006	CP	%	110			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Au0071006	CP	%	133			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0071006	CP	%	87			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Au0071006	CP	%	96			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0071006	CP	%	108			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0071006	CP	%	95			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Au0071006	CP	%	98			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0071006	CP	%	90			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Au0071006	CP	%	73			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0071006	CP	%	97			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Au0071006	CP	%	89			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Au0071006	CP	%	98			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0071006	CP	%	76			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Au0071006	CP	%	75			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0071006	CP	%	92			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0071006	CP	%	83			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Au0071006	CP	%	71			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Au0071006	CP	%	99			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-Au0071006	CP	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0071006	CP	%	105			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0071006	CP	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0071006	CP	%	99			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Au0071016	CP	%	101			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Au0071016	CP	%	63			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Au0071016	CP	%	91			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Au0071016	CP	%	95			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Au0071016	CP	%	103			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Au0071016	CP	%	104			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Au0071016	CP	%	107			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Au0071016	CP	%	143			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Au0071016	CP	%	116			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Au0071016	CP	%	128			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0071016	CP	%	100			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Au0071016	CP	%	101			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0071016	CP	%	101			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0071016	CP	%	95			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-Au0071016	CP	%	98			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0071016	CP	%	81			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Au0071016	CP	%	83			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0071016	CP	%	96			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Au0071016	CP	%	84			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Au0071016	CP	%	104			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0071016	CP	%	77			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Au0071016	CP	%	77			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0071016	CP	%	80			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0071016	CP	%	103			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Au0071016	CP	%	103			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Au0071016	CP	%	98			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	M23-Au0071016	CP	%	87			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0071016	CP	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0071016	CP	%	87			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0071016	CP	%	96			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluoropentanoic acid (PFPeA)	M23-Au0071027	CP	%	83			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Au0071027	CP	%	110			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Au0071027	CP	%	107			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Au0071027	CP	%	107			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Au0071027	CP	%	104			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Au0071027	CP	%	112			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Au0071027	CP	%	119			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Au0071027	CP	%	127			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Au0071027	CP	%	120			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0071027	CP	%	103			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Au0071027	CP	%	105			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0071027	CP	%	106			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0071027	CP	%	97			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Au0071027	CP	%	109			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0071027	CP	%	102			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Au0071027	CP	%	93			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0071027	CP	%	104			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Au0071027	CP	%	92			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Au0071027	CP	%	102			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0071027	CP	%	84			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Au0071027	CP	%	83			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0071027	CP	%	98			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0071027	CP	%	99			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Au0071027	CP	%	99			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Au0071027	CP	%	99			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-Au0071027	CP	%	83			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0071027	CP	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0071027	CP	%	99			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0071027	CP	%	109			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Au0071047	CP	%	80			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Au0071047	CP	%	98			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Au0071047	CP	%	94			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Au0071047	CP	%	96			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Au0071047	CP	%	91			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Au0071047	CP	%	87			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Au0071047	CP	%	81			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Au0071047	CP	%	81			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Au0071047	CP	%	78			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Au0071047	CP	%	90			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0071047	CP	%	85			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctane sulfonamide (FOSA)	M23-Au0071047	CP	%	109			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0071047	CP	%	99			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0071047	CP	%	100			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Au0071047	CP	%	82			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0071047	CP	%	88			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Au0071047	CP	%	91			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0071047	CP	%	95			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Au0071047	CP	%	82			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Au0071047	CP	%	95			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0071047	CP	%	78			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Au0071047	CP	%	84			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0071047	CP	%	88			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0071047	CP	%	122			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Au0071047	CP	%	87			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Au0071047	CP	%	114			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-Au0071047	CP	%	99			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0071047	CP	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0071047	CP	%	89			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0071047	CP	%	91			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Au0071056	CP	%	84			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Au0071056	CP	%	98			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Au0071056	CP	%	96			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Au0071056	CP	%	103			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Au0071056	CP	%	90			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Au0071056	CP	%	91			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Au0071056	CP	%	89			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Au0071056	CP	%	91			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Au0071056	CP	%	88			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Au0071056	CP	%	110			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0071056	CP	%	85			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Au0071056	CP	%	111			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0071056	CP	%	103			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0071056	CP	%	101			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Au0071056	CP	%	81			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0071056	CP	%	93			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Au0071056	CP	%	101			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0071056	CP	%	102			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Au0071056	CP	%	88			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Au0071056	CP	%	89			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0071056	CP	%	81			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Au0071056	CP	%	81			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0071056	CP	%	88			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0071056	CP	%	120			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Au0071056	CP	%	99			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Au0071056	CP	%	110			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-Au0071056	CP	%	98			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0071056	CP	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0071056	CP	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0071056	CP	%	89			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Au0071067	CP	%	81			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Au0071067	CP	%	99			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Au0071067	CP	%	98			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Au0071067	CP	%	97			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Au0071067	CP	%	100			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Au0071067	CP	%	90			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Au0071067	CP	%	87			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Au0071067	CP	%	87			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Au0071067	CP	%	78			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorotridecanoic acid (PFTrDA)	M23-Au0071067	CP	%	86			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0071067	CP	%	82			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Au0071067	CP	%	105			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0071067	CP	%	98			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0071067	CP	%	99			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Au0071067	CP	%	87			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0071067	CP	%	92			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Au0071067	CP	%	115			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0071067	CP	%	80			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Au0071067	CP	%	95			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Au0071067	CP	%	100			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0071067	CP	%	86			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Au0071067	CP	%	81			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0071067	CP	%	99			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0071067	CP	%	127			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Au0071067	CP	%	93			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Au0071067	CP	%	136			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-Au0071067	CP	%	89			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0071067	CP	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0071067	CP	%	90			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0071067	CP	%	78			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	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			
Perfluorodecanoic acid (PFDA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Au0071005	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0071005	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Au0071005	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-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0071005	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0071005	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate								
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD		
Perfluorobutanoic acid (PFBA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropentanoic acid (PFPeA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorohexanoic acid (PFHxA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroheptanoic acid (PFHpA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorooctanoic acid (PFOA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorononanoic acid (PFNA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorodecanoic acid (PFDA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroundecanoic acid (PFUnDA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorododecanoic acid (PFDoDA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorotridecanoic acid (PFTrDA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD		
Perfluorooctane sulfonamide (FOSA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Au0071015	CP	ug/kg	< 10	< 10	<1	30%	Pass
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0071015	CP	ug/kg	< 10	< 10	<1	30%	Pass
Duplicate								
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD		
Perfluorobutanesulfonic acid (PFBS)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorononanesulfonic acid (PFNS)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoropentanesulfonic acid (PFPeS)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorooctanesulfonic acid (PFOS)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
Perfluorodecanesulfonic acid (PFDS)	M23-Au0071015	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-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0071015	CP	ug/kg	< 10	< 10	<1	30%	Pass
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0071015	CP	ug/kg	< 5	< 5	<1	30%	Pass

Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-Au0071018	CP	%	25	24	3.7	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Au0071026	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0071026	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Au0071026	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-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0071026	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0071026	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-Au0071039	CP	%	17	16	9.4	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Au0071046	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0071046	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Au0071046	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-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0071046	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0071046	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-Au0071049	CP	%	12	13	8.2	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Au0071055	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0071055	CP	ug/kg	< 10	< 10	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Au0071055	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-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0071055	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0071055	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-Au0071059	CP	%	22	21	4.5	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Au0071066	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Au0071066	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorononanesulfonic acid (PFNS)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Au0071066	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-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Au0071066	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Au0071066	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-Au0071069	CP	%	21	21	<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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Due: Sep 13, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH48_0.1-0.2	Sep 04, 2023		Soil	M23-Se0014510		X	X
2	BH49_0.01-0.1	Sep 04, 2023		Soil	M23-Se0014511		X	X
3	BH50_0.01-0.1	Sep 04, 2023		Soil	M23-Se0014512		X	X
4	BH50_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014513		X	X
5	BH51_0.01-0.1	Sep 04, 2023		Soil	M23-Se0014514		X	X
6	BH52_0.01-0.15	Sep 04, 2023		Soil	M23-Se0014515		X	X
7	BH53_0.01-0.15	Sep 04, 2023		Soil	M23-Se0014516		X	X
8	BH54_0.0-0.15	Sep 04, 2023		Soil	M23-Se0014517		X	X
9	BH54_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014518		X	X
10	BH55_0.01-0.1	Sep 04, 2023		Soil	M23-Se0014519		X	X
11	BH56_0.01-0.2	Sep 04, 2023		Soil	M23-Se0014520		X	X
12	BH57_0-0.1	Sep 05, 2023		Soil	M23-Se0014521		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
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IANZ# 1327	IANZ# 1290	IANZ# 1402

Company Name: GHD Pty Ltd SA
Address: GPO Box 2052
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Project Name: MFS OAKDEN DSI
Project ID: 12611126

Order No.:
Report #: 1024020
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 6, 2023 5:21 PM
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Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
13	BH57_1.4-1.5	Sep 05, 2023		Soil	M23-Se0014522		X	X
14	BH58_0-0.1	Sep 05, 2023		Soil	M23-Se0014523		X	X
15	BH58_3.9-4.0	Sep 05, 2023		Soil	M23-Se0014524		X	X
16	BH59_0-0.06	Sep 05, 2023		Soil	M23-Se0014525		X	X
17	BH60_0.01-0.15	Sep 05, 2023		Soil	M23-Se0014526		X	X
18	BH61_0.01-0.05	Sep 05, 2023		Soil	M23-Se0014527		X	X
19	BH62_0.01-0.1	Sep 05, 2023		Soil	M23-Se0014528		X	X
20	BH62_2.4-2.5	Sep 05, 2023		Soil	M23-Se0014529		X	X
21	BH63_0.9-1.0	Sep 05, 2023		Soil	M23-Se0014530		X	X
22	BH64_0.01-0.1	Sep 05, 2023		Soil	M23-Se0014531		X	X
23	BH65_0.01-0.1	Sep 05, 2023		Soil	M23-Se0014532		X	X
24	BH65_2.4-2.5	Sep 05, 2023		Soil	M23-Se0014533		X	X
25	QC01A	Sep 05, 2023		Soil	M23-Se0014534		X	X
26	QC02A	Sep 05, 2023		Soil	M23-Se0014535		X	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
27	RINSATE01	Sep 05, 2023		Water	M23-Se0014536			X
28	QC03A	Sep 05, 2023		Soil	M23-Se0014537		X	X
29	QC04A	Sep 05, 2023		Soil	M23-Se0014538		X	X
30	QC05A	Sep 05, 2023		Soil	M23-Se0014539		X	X
31	RINSATE02	Sep 05, 2023		Water	M23-Se0014540			X
32	BH48_0.3-0.4	Sep 04, 2023		Soil	M23-Se0014541	X		
33	BH48_0.9-1.0	Sep 04, 2023		Soil	M23-Se0014542	X		
34	BH48_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014543	X		
35	BH48_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014544	X		
36	BH49_0.15-0.25	Sep 04, 2023		Soil	M23-Se0014545	X		
37	BH49_0.65-0.75	Sep 04, 2023		Soil	M23-Se0014546	X		
38	BH49_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014547	X		
39	BH49_1.9-2.0	Sep 04, 2023		Soil	M23-Se0014548	X		
40	BH49_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014549	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
41	BH50_0.65-0.75	Sep 04, 2023		Soil	M23-Se0014550	X		
42	BH50_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014551	X		
43	BH51_0.5-0.6	Sep 04, 2023		Soil	M23-Se0014552	X		
44	BH51_0.9-1.0	Sep 04, 2023		Soil	M23-Se0014553	X		
45	BH51_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014554	X		
46	BH51_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014555	X		
47	BH52_0.3-0.4	Sep 04, 2023		Soil	M23-Se0014556	X		
48	BH52_0.9-1.0	Sep 04, 2023		Soil	M23-Se0014557	X		
49	BH52_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014558	X		
50	BH52_1.9-2.0	Sep 04, 2023		Soil	M23-Se0014559	X		
51	BH52_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014560	X		
52	BH53_0.25-0.35	Sep 04, 2023		Soil	M23-Se0014561	X		
53	BH53_1.1-1.2	Sep 04, 2023		Soil	M23-Se0014562	X		
54	BH53_1.6-1.7	Sep 04, 2023		Soil	M23-Se0014563	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
55	BH53_2.1-2.2	Sep 04, 2023		Soil	M23-Se0014564	X		
56	BH53_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014565	X		
57	BH54_0.3-0.4	Sep 04, 2023		Soil	M23-Se0014566	X		
58	BH54_0.9-1.0	Sep 04, 2023		Soil	M23-Se0014567	X		
59	BH54_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014568	X		
60	BH54_1.9-2.0	Sep 04, 2023		Soil	M23-Se0014569	X		
61	BH55_0.15-0.25	Sep 04, 2023		Soil	M23-Se0014570	X		
62	BH55_0.75-0.85	Sep 04, 2023		Soil	M23-Se0014571	X		
63	BH55_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014572	X		
64	BH55_1.9-2.0	Sep 04, 2023		Soil	M23-Se0014573	X		
65	BH55_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014574	X		
66	BH56_0.2-0.3	Sep 04, 2023		Soil	M23-Se0014575	X		
67	BH56_0.4-0.5	Sep 04, 2023		Soil	M23-Se0014576	X		
68	BH56_0.9-1.0	Sep 04, 2023		Soil	M23-Se0014577	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
69	BH56_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014578	X		
70	BH56_1.9-2.0	Sep 04, 2023		Soil	M23-Se0014579	X		
71	BH56_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014580	X		
72	BH57_0.4-0.5	Sep 05, 2023		Soil	M23-Se0014581	X		
73	BH57_0.7-0.8	Sep 05, 2023		Soil	M23-Se0014582	X		
74	BH57_1.9-2.0	Sep 05, 2023		Soil	M23-Se0014583	X		
75	BH57_2.9-3.0	Sep 05, 2023		Soil	M23-Se0014584	X		
76	BH57_3.9-4.0	Sep 05, 2023		Soil	M23-Se0014585	X		
77	BH57_4.9-5.0	Sep 05, 2023		Soil	M23-Se0014586	X		
78	BH58_0.3-0.4	Sep 05, 2023		Soil	M23-Se0014587	X		
79	BH58_0.5-0.6	Sep 05, 2023		Soil	M23-Se0014588	X		
80	BH58_0.75-0.85	Sep 05, 2023		Soil	M23-Se0014589	X		
81	BH58_1.5-1.6	Sep 05, 2023		Soil	M23-Se0014590	X		
82	BH58_2.1-2.3	Sep 05, 2023		Soil	M23-Se0014591	X		
83	BH58_2.9-3.0	Sep 05, 2023		Soil	M23-Se0014592	X		

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
84	BH59_0.3-0.4	Sep 05, 2023		Soil	M23-Se0014593	X		
85	BH59_0.6-0.7	Sep 05, 2023		Soil	M23-Se0014594	X		
86	BH59_0.95-1.05	Sep 05, 2023		Soil	M23-Se0014595	X		
87	BH59_1.3-1.4	Sep 05, 2023		Soil	M23-Se0014596	X		
88	BH59_1.9-2.0	Sep 05, 2023		Soil	M23-Se0014597	X		
89	BH59_2.4-2.5	Sep 05, 2023		Soil	M23-Se0014598	X		
90	BH60_0.4-0.5	Sep 05, 2023		Soil	M23-Se0014599	X		
91	BH60_0.9-1.0	Sep 05, 2023		Soil	M23-Se0014600	X		
92	BH60_1.3-1.4	Sep 05, 2023		Soil	M23-Se0014601	X		
93	BH60_1.6-1.7	Sep 05, 2023		Soil	M23-Se0014602	X		
94	BH60_2.4-2.5	Sep 05, 2023		Soil	M23-Se0014603	X		
95	BH61_0.05-0.15	Sep 05, 2023		Soil	M23-Se0014604	X		
96	BH61_0.5-0.6	Sep 05, 2023		Soil	M23-Se0014605	X		
97	BH61_1.15-1.25	Sep 05, 2023		Soil	M23-Se0014606	X		

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NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	NATA# 1261	Site# 25079 & 25289
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Received: Sep 6, 2023 5:21 PM
Due: Sep 13, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
98	BH61_1.9-2.0	Sep 05, 2023		Soil	M23-Se0014607	X		
99	BH61_2.4-2.5	Sep 05, 2023		Soil	M23-Se0014608	X		
100	BH62_0.2-0.3	Sep 05, 2023		Soil	M23-Se0014609	X		
101	BH62_0.8-0.9	Sep 05, 2023		Soil	M23-Se0014610	X		
102	BH62_1.4-1.5	Sep 05, 2023		Soil	M23-Se0014611	X		
103	BH62_1.9-2.0	Sep 05, 2023		Soil	M23-Se0014612	X		
104	BH63_0.01-0.11	Sep 05, 2023		Soil	M23-Se0014613	X		
105	BH63_0.1-0.2	Sep 05, 2023		Soil	M23-Se0014614	X		
106	BH63_0.4-0.53	Sep 05, 2023		Soil	M23-Se0014615	X		
107	BH63_1.15-1.25	Sep 05, 2023		Soil	M23-Se0014616	X		
108	BH63_1.4-1.5	Sep 05, 2023		Soil	M23-Se0014617	X		
109	BH63_2.4-2.5	Sep 05, 2023		Soil	M23-Se0014618	X		
110	BH64_0.15-0.25	Sep 05, 2023		Soil	M23-Se0014619	X		
111	BH64_0.75-	Sep 05, 2023		Soil	M23-Se0014620	X		

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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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NZBN: 9429046024954

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35 O'Rorke Road	43 Detroit Drive	1277 Cameron Road,
Penrose,	Rolleston,	Gate Pa,
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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

Order No.:
Report #: 1024020
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 6, 2023 5:21 PM
Due: Sep 13, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Project Name: MFS OAKDEN DSI
Project ID: 12611126

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
111	BH64_0.75-0.85	Sep 05, 2023		Soil	M23-Se0014620			
112	BH64_1.4-1.5	Sep 05, 2023		Soil	M23-Se0014621	X		
113	BH64_1.9-2.0	Sep 05, 2023		Soil	M23-Se0014622	X		
114	BH64_2.4-2.5	Sep 05, 2023		Soil	M23-Se0014623	X		
115	BH65_0.3-0.4	Sep 05, 2023		Soil	M23-Se0014624	X		
116	BH65_0.9-1.0	Sep 05, 2023		Soil	M23-Se0014625	X		
117	BH65_1.4-1.5	Sep 05, 2023		Soil	M23-Se0014626	X		
118	BH65_1.9-2.0	Sep 05, 2023		Soil	M23-Se0014627	X		
119	BH50_1.9-2.0	Sep 05, 2023		Soil	M23-Se0014965	X		
Test Counts						88	29	31

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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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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 OAKDEN DSI
Project ID:	12611126
Turnaround time:	5 Day
Date/Time received	Sep 6, 2023 5:21 PM
Eurofins reference	1024020

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

MISSING SAMPLE BH50_1.9-2.0.

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 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.

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 **1024020-S**
Project name MFS OAKDEN DSI
Project ID 12611126
Received Date Sep 06, 2023

Client Sample ID			**BH48_0.1-0.2**	**BH49_0.01-0.1**	**BH50_0.01-0.1**	**BH50_2.4-2.5**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M23-Se0014510**	**M23-Se0014511**	**M23-Se0014512**	**M23-Se0014513**
Date Sampled			**Sep 04, 2023**	**Sep 04, 2023**	**Sep 04, 2023**	**Sep 04, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	18	17	18	21
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	%	89	98	97	104
13C5-PFPeA (surr.)	1	%	115	114	109	120
13C5-PFHxA (surr.)	1	%	116	114	119	121
13C4-PFHpA (surr.)	1	%	123	113	107	110
13C8-PFOA (surr.)	1	%	113	128	121	139
13C5-PFNA (surr.)	1	%	102	93	99	101
13C6-PFDA (surr.)	1	%	89	95	100	96
13C2-PFUnDA (surr.)	1	%	118	110	110	127
13C2-PFDoDA (surr.)	1	%	106	113	110	122
13C2-PFTeDA (surr.)	1	%	104	110	111	115
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			BH48_0.1-0.2	BH49_0.01-0.1	BH50_0.01-0.1	BH50_2.4-2.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014510	M23-Se0014511	M23-Se0014512	M23-Se0014513
Date Sampled			Sep 04, 2023	Sep 04, 2023	Sep 04, 2023	Sep 04, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	80	80	88	81
D3-N-MeFOSA (surr.)	1	%	121	117	120	121
D5-N-EtFOSA (surr.)	1	%	121	119	123	126
D7-N-MeFOSE (surr.)	1	%	116	115	123	128
D9-N-EtFOSE (surr.)	1	%	115	111	115	117
D5-N-EtFOSAA (surr.)	1	%	118	119	126	129
D3-N-MeFOSAA (surr.)	1	%	119	114	116	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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	[N09]12	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	112	116	110	120
18O2-PFHxS (surr.)	1	%	111	112	110	117
13C8-PFOS (surr.)	1	%	96	100	96	93
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	%	84	126	137	88
13C2-6:2 FTSA (surr.)	1	%	114	130	120	119
13C2-8:2 FTSA (surr.)	1	%	125	121	145	118
13C2-10:2 FTSA (surr.)	1	%	134	128	126	137
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	12	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	12	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	12	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	12	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH51_0.01-0.1	BH52_0.01-0.15	BH53_0.01-0.15	BH54_0.0-0.15
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014514	M23-Se0014515	M23-Se0014516	M23-Se0014517
Date Sampled			Sep 04, 2023	Sep 04, 2023	Sep 04, 2023	Sep 04, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	15	11	11	11
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	%	97	105	104	99
13C5-PFPeA (surr.)	1	%	115	122	111	119
13C5-PFHxA (surr.)	1	%	120	128	127	122
13C4-PFHpA (surr.)	1	%	105	99	111	106
13C8-PFOA (surr.)	1	%	117	123	133	119
13C5-PFNA (surr.)	1	%	96	115	105	107
13C6-PFDA (surr.)	1	%	96	103	103	96
13C2-PFUnDA (surr.)	1	%	92	121	115	115
13C2-PFDoDA (surr.)	1	%	107	129	127	117
13C2-PFTeDA (surr.)	1	%	101	114	111	102
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	%	78	86	81	89
D3-N-MeFOSA (surr.)	1	%	122	135	128	130
D5-N-EtFOSA (surr.)	1	%	119	126	126	122
D7-N-MeFOSE (surr.)	1	%	107	125	120	113
D9-N-EtFOSE (surr.)	1	%	110	116	119	115
D5-N-EtFOSAA (surr.)	1	%	106	126	129	115
D3-N-MeFOSAA (surr.)	1	%	106	123	126	117
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			BH51_0.01-0.1	BH52_0.01-0.15	BH53_0.01-0.15	BH54_0.0-0.15
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014514	M23-Se0014515	M23-Se0014516	M23-Se0014517
Date Sampled			Sep 04, 2023	Sep 04, 2023	Sep 04, 2023	Sep 04, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	[N09]9.0	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	111	117	112	112
18O2-PFHxS (surr.)	1	%	110	107	109	113
13C8-PFOS (surr.)	1	%	98	99	101	104
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	%	96	98	95	94
13C2-6:2 FTSA (surr.)	1	%	111	103	120	110
13C2-8:2 FTSA (surr.)	1	%	122	129	128	138
13C2-10:2 FTSA (surr.)	1	%	120	135	140	136
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	9	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	9	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	9	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH54_2.4-2.5	BH55_0.01-0.1	BH56_0.01-0.2	BH57_0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014518	M23-Se0014519	M23-Se0014520	M23-Se0014521
Date Sampled			Sep 04, 2023	Sep 04, 2023	Sep 04, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	18	19	16	14
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	%	117	106	93	93
13C5-PFPeA (surr.)	1	%	105	99	84	84
13C5-PFHxA (surr.)	1	%	121	113	94	105

Client Sample ID			BH54_2.4-2.5	BH55_0.01-0.1	BH56_0.01-0.2	BH57_0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014518	M23-Se0014519	M23-Se0014520	M23-Se0014521
Date Sampled			Sep 04, 2023	Sep 04, 2023	Sep 04, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C4-PFHpA (surr.)	1	%	98	88	72	77
13C8-PFOA (surr.)	1	%	100	92	74	62
13C5-PFNA (surr.)	1	%	94	86	67	44
13C6-PFDA (surr.)	1	%	96	87	70	46
13C2-PFUnDA (surr.)	1	%	61	73	59	14
13C2-PFDoDA (surr.)	1	%	94	89	68	13
13C2-PFTeDA (surr.)	1	%	100	85	64	27
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	%	96	96	80	27
D3-N-MeFOSA (surr.)	1	%	101	96	74	62
D5-N-EtFOSA (surr.)	1	%	128	114	89	71
D7-N-MeFOSE (surr.)	1	%	73	80	68	42
D9-N-EtFOSE (surr.)	1	%	88	83	65	44
D5-N-EtFOSAA (surr.)	1	%	149	108	92	28
D3-N-MeFOSAA (surr.)	1	%	126	116	83	15
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	< 5	< 5	[N09]14
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	[N09]93
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	106	95	82	90
18O2-PFHxS (surr.)	1	%	87	76	62	64
13C8-PFOS (surr.)	1	%	60	84	65	116
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	%	99	96	79	80
13C2-6:2 FTSA (surr.)	1	%	110	98	80	70
13C2-8:2 FTSA (surr.)	1	%	134	98	81	27
13C2-10:2 FTSA (surr.)	1	%	104	115	84	13

Client Sample ID			BH54_2.4-2.5	BH55_0.01-0.1	BH56_0.01-0.2	BH57_0-0.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014518	M23-Se0014519	M23-Se0014520	M23-Se0014521
Date Sampled			Sep 04, 2023	Sep 04, 2023	Sep 04, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	107
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	93
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	107
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	107
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	107

Client Sample ID			BH57_1.4-1.5	BH58_0-0.1	BH58_3.9-4.0	BH59_0-0.06
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014522	M23-Se0014523	M23-Se0014524	M23-Se0014525
Date Sampled			Sep 05, 2023	Sep 05, 2023	Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	15	21	22	8.6
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	8.4	< 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	%	103	100	108	114
13C5-PFPeA (surr.)	1	%	95	92	99	100
13C5-PFHxA (surr.)	1	%	110	102	115	111
13C4-PFHpA (surr.)	1	%	89	82	92	94
13C8-PFOA (surr.)	1	%	94	79	93	92
13C5-PFNA (surr.)	1	%	87	73	87	89
13C6-PFDA (surr.)	1	%	93	84	90	97
13C2-PFUnDA (surr.)	1	%	76	60	64	74
13C2-PFDoDA (surr.)	1	%	90	59	89	87
13C2-PFTeDA (surr.)	1	%	91	80	96	102
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			BH57_1.4-1.5	BH58_0-0.1	BH58_3.9-4.0	BH59_0-0.06
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014522	M23-Se0014523	M23-Se0014524	M23-Se0014525
Date Sampled			Sep 05, 2023	Sep 05, 2023	Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	99	77	91	98
D3-N-MeFOSA (surr.)	1	%	108	90	106	99
D5-N-EtFOSA (surr.)	1	%	126	102	124	122
D7-N-MeFOSE (surr.)	1	%	87	57	85	78
D9-N-EtFOSE (surr.)	1	%	87	62	87	83
D5-N-EtFOSAA (surr.)	1	%	114	84	122	110
D3-N-MeFOSAA (surr.)	1	%	114	59	119	103
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	[N09]11	< 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	[N09]8.1	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	[N09]50	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	[N09]19	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	91	89	101	101
18O2-PFHxS (surr.)	1	%	84	72	84	80
13C8-PFOS (surr.)	1	%	83	72	62	92
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	%	87	96	82	109
13C2-6:2 FTSA (surr.)	1	%	97	92	91	117
13C2-8:2 FTSA (surr.)	1	%	101	68	120	96
13C2-10:2 FTSA (surr.)	1	%	119	63	106	95
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	50	19	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	19	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	50	19	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	69.4	19	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	77.5	< 50	< 50	< 50

Client Sample ID			BH60_0.01-0.15	BH61_0.01-0.05	BH62_0.01-0.1	BH62_2.4-2.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014526	M23-Se0014527	M23-Se0014528	M23-Se0014529
Date Sampled			Sep 05, 2023	Sep 05, 2023	Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	5.2	12	10	21
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	%	109	106	112	106
13C5-PFPeA (surr.)	1	%	100	98	102	99
13C5-PFHxA (surr.)	1	%	115	119	115	115
13C4-PFHpA (surr.)	1	%	92	88	94	93
13C8-PFOA (surr.)	1	%	92	85	92	95
13C5-PFNA (surr.)	1	%	89	84	84	93
13C6-PFDA (surr.)	1	%	96	92	86	93
13C2-PFUnDA (surr.)	1	%	76	68	56	73
13C2-PFDoDA (surr.)	1	%	84	66	51	93
13C2-PFTeDA (surr.)	1	%	102	95	64	100
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	%	98	80	74	97
D3-N-MeFOSA (surr.)	1	%	104	103	99	104
D5-N-EtFOSA (surr.)	1	%	123	114	117	128
D7-N-MeFOSE (surr.)	1	%	79	81	70	85
D9-N-EtFOSE (surr.)	1	%	88	83	76	89
D5-N-EtFOSAA (surr.)	1	%	107	92	82	129
D3-N-MeFOSAA (surr.)	1	%	108	72	54	122
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5

Client Sample ID			BH60_0.01-0.15	BH61_0.01-0.05	BH62_0.01-0.1	BH62_2.4-2.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014526	M23-Se0014527	M23-Se0014528	M23-Se0014529
Date Sampled			Sep 05, 2023	Sep 05, 2023	Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonic acids (PFSAs)						
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	[N09]10	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	102	104	95	97
18O2-PFHxS (surr.)	1	%	82	84	79	88
13C8-PFOS (surr.)	1	%	81	83	85	76
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	%	107	99	98	85
13C2-6:2 FTSA (surr.)	1	%	109	121	105	97
13C2-8:2 FTSA (surr.)	1	%	104	102	76	117
13C2-10:2 FTSA (surr.)	1	%	111	78	56	117
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	10	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	10	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	10	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH63_0.9-1.0	BH64_0.01-0.1	BH65_0.01-0.1	BH65_2.4-2.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014530	M23-Se0014531	M23-Se0014532	M23-Se0014533
Date Sampled			Sep 05, 2023	Sep 05, 2023	Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	17	21	19	21
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	%	102	91	94	94
13C5-PFPeA (surr.)	1	%	115	106	111	109
13C5-PFHxA (surr.)	1	%	119	106	117	125

Client Sample ID			BH63_0.9-1.0	BH64_0.01-0.1	BH65_0.01-0.1	BH65_2.4-2.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014530	M23-Se0014531	M23-Se0014532	M23-Se0014533
Date Sampled			Sep 05, 2023	Sep 05, 2023	Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
13C4-PFHpA (surr.)	1	%	106	104	103	105
13C8-PFOA (surr.)	1	%	119	111	108	117
13C5-PFNA (surr.)	1	%	102	94	94	100
13C6-PFDA (surr.)	1	%	95	88	89	92
13C2-PFUnDA (surr.)	1	%	115	75	86	120
13C2-PFDoDA (surr.)	1	%	121	96	101	109
13C2-PFTeDA (surr.)	1	%	100	96	96	101
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	%	83	78	76	77
D3-N-MeFOSA (surr.)	1	%	126	113	113	121
D5-N-EtFOSA (surr.)	1	%	122	106	112	119
D7-N-MeFOSE (surr.)	1	%	121	92	100	117
D9-N-EtFOSE (surr.)	1	%	118	88	100	113
D5-N-EtFOSAA (surr.)	1	%	123	77	103	122
D3-N-MeFOSAA (surr.)	1	%	121	83	100	123
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	[N09]16	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	[N09]170	[N09]63	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	111	119	112	107
18O2-PFHxS (surr.)	1	%	107	109	108	111
13C8-PFOS (surr.)	1	%	97	84	93	92
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	%	108	106	94	87
13C2-6:2 FTSA (surr.)	1	%	116	112	118	112
13C2-8:2 FTSA (surr.)	1	%	124	120	116	116
13C2-10:2 FTSA (surr.)	1	%	129	107	122	122

Client Sample ID			BH63_0.9-1.0	BH64_0.01-0.1	BH65_0.01-0.1	BH65_2.4-2.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014530	M23-Se0014531	M23-Se0014532	M23-Se0014533
Date Sampled			Sep 05, 2023	Sep 05, 2023	Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	16	170	63	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	170	63	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	16	170	63	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	16	170	63	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	170	63	< 50

Client Sample ID			QC01A	QC02A	QC03A	QC04A
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014534	M23-Se0014535	M23-Se0014537	M23-Se0014538
Date Sampled			Sep 05, 2023	Sep 05, 2023	Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	20	17	21	21
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	%	99	103	99	96
13C5-PFPeA (surr.)	1	%	115	114	107	116
13C5-PFHxA (surr.)	1	%	121	116	118	120
13C4-PFHpA (surr.)	1	%	107	101	110	103
13C8-PFOA (surr.)	1	%	113	118	120	105
13C5-PFNA (surr.)	1	%	95	102	94	97
13C6-PFDA (surr.)	1	%	93	92	89	85
13C2-PFUnDA (surr.)	1	%	120	121	126	117
13C2-PFDoDA (surr.)	1	%	112	105	109	105
13C2-PFTeDA (surr.)	1	%	103	106	102	98
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			QC01A	QC02A	QC03A	QC04A
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0014534	M23-Se0014535	M23-Se0014537	M23-Se0014538
Date Sampled			Sep 05, 2023	Sep 05, 2023	Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	78	80	79	78
D3-N-MeFOSA (surr.)	1	%	121	124	122	128
D5-N-EtFOSA (surr.)	1	%	122	123	128	123
D7-N-MeFOSE (surr.)	1	%	115	109	114	109
D9-N-EtFOSE (surr.)	1	%	108	103	113	111
D5-N-EtFOSAA (surr.)	1	%	123	124	116	124
D3-N-MeFOSAA (surr.)	1	%	120	124	115	122
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	111	110	106	111
18O2-PFHxS (surr.)	1	%	116	111	119	111
13C8-PFOS (surr.)	1	%	94	97	92	93
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	%	96	93	97	80
13C2-6:2 FTSA (surr.)	1	%	118	110	113	117
13C2-8:2 FTSA (surr.)	1	%	103	112	107	126
13C2-10:2 FTSA (surr.)	1	%	125	127	129	128
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			QC05A
Sample Matrix			Soil
Eurofins Sample No.			M23-Se0014539
Date Sampled			Sep 05, 2023
Test/Reference	LOR	Unit	
Sample Properties			
% Moisture	1	%	20
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	%	90
13C5-PFPeA (surr.)	1	%	106
13C5-PFHxA (surr.)	1	%	108
13C4-PFHpA (surr.)	1	%	101
13C8-PFOA (surr.)	1	%	110
13C5-PFNA (surr.)	1	%	98
13C6-PFDA (surr.)	1	%	95
13C2-PFUnDA (surr.)	1	%	106
13C2-PFDoDA (surr.)	1	%	116
13C2-PFTeDA (surr.)	1	%	99
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
13C8-FOSA (surr.)	1	%	76
D3-N-MeFOSA (surr.)	1	%	124
D5-N-EtFOSA (surr.)	1	%	121
D7-N-MeFOSE (surr.)	1	%	107
D9-N-EtFOSE (surr.)	1	%	102
D5-N-EtFOSAA (surr.)	1	%	115
D3-N-MeFOSAA (surr.)	1	%	115
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5

Client Sample ID			QC05A
Sample Matrix			**Soil**
Eurofins Sample No.			**M23-Se0014539**
Date Sampled			**Sep 05, 2023**
Test/Reference	LOR	Unit	
Perfluoroalkyl sulfonic acids (PFSAs)			
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5
13C3-PFBS (surr.)	1	%	107
18O2-PFHxS (surr.)	1	%	106
13C8-PFOS (surr.)	1	%	95
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	%	82
13C2-6:2 FTSA (surr.)	1	%	103
13C2-8:2 FTSA (surr.)	1	%	123
13C2-10:2 FTSA (surr.)	1	%	119
PFASs Summations			
Sum (PFHxS + PFOS)*	5	ug/kg	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Sep 07, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Sep 07, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Sep 07, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Sep 07, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Sep 07, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Sep 07, 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 OAKDEN DSI
Project ID: 12611126

Order No.:
Report #: 1024020
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 6, 2023 5:21 PM
Due: Sep 13, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH48_0.1-0.2	Sep 04, 2023		Soil	M23-Se0014510		X	X
2	BH49_0.01-0.1	Sep 04, 2023		Soil	M23-Se0014511		X	X
3	BH50_0.01-0.1	Sep 04, 2023		Soil	M23-Se0014512		X	X
4	BH50_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014513		X	X
5	BH51_0.01-0.1	Sep 04, 2023		Soil	M23-Se0014514		X	X
6	BH52_0.01-0.15	Sep 04, 2023		Soil	M23-Se0014515		X	X
7	BH53_0.01-0.15	Sep 04, 2023		Soil	M23-Se0014516		X	X
8	BH54_0.0-0.15	Sep 04, 2023		Soil	M23-Se0014517		X	X
9	BH54_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014518		X	X
10	BH55_0.01-0.1	Sep 04, 2023		Soil	M23-Se0014519		X	X
11	BH56_0.01-0.2	Sep 04, 2023		Soil	M23-Se0014520		X	X
12	BH57_0-0.1	Sep 05, 2023		Soil	M23-Se0014521		X	X

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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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Company Name: GHD Pty Ltd SA
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Project Name: MFS OAKDEN DSI
Project ID: 12611126

Order No.:
Report #: 1024020
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 6, 2023 5:21 PM
Due: Sep 13, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
13	BH57_1.4-1.5	Sep 05, 2023		Soil	M23-Se0014522		X	X
14	BH58_0-0.1	Sep 05, 2023		Soil	M23-Se0014523		X	X
15	BH58_3.9-4.0	Sep 05, 2023		Soil	M23-Se0014524		X	X
16	BH59_0-0.06	Sep 05, 2023		Soil	M23-Se0014525		X	X
17	BH60_0.01-0.15	Sep 05, 2023		Soil	M23-Se0014526		X	X
18	BH61_0.01-0.05	Sep 05, 2023		Soil	M23-Se0014527		X	X
19	BH62_0.01-0.1	Sep 05, 2023		Soil	M23-Se0014528		X	X
20	BH62_2.4-2.5	Sep 05, 2023		Soil	M23-Se0014529		X	X
21	BH63_0.9-1.0	Sep 05, 2023		Soil	M23-Se0014530		X	X
22	BH64_0.01-0.1	Sep 05, 2023		Soil	M23-Se0014531		X	X
23	BH65_0.01-0.1	Sep 05, 2023		Soil	M23-Se0014532		X	X
24	BH65_2.4-2.5	Sep 05, 2023		Soil	M23-Se0014533		X	X
25	QC01A	Sep 05, 2023		Soil	M23-Se0014534		X	X
26	QC02A	Sep 05, 2023		Soil	M23-Se0014535		X	X

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Project ID: 12611126

Order No.:
Report #: 1024020
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 6, 2023 5:21 PM
Due: Sep 13, 2023
Priority: 5 Day
Contact Name: Tom Duncan

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
27	RINSATE01	Sep 05, 2023		Water	M23-Se0014536			X
28	QC03A	Sep 05, 2023		Soil	M23-Se0014537		X	X
29	QC04A	Sep 05, 2023		Soil	M23-Se0014538		X	X
30	QC05A	Sep 05, 2023		Soil	M23-Se0014539		X	X
31	RINSATE02	Sep 05, 2023		Water	M23-Se0014540			X
32	BH48_0.3-0.4	Sep 04, 2023		Soil	M23-Se0014541	X		
33	BH48_0.9-1.0	Sep 04, 2023		Soil	M23-Se0014542	X		
34	BH48_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014543	X		
35	BH48_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014544	X		
36	BH49_0.15-0.25	Sep 04, 2023		Soil	M23-Se0014545	X		
37	BH49_0.65-0.75	Sep 04, 2023		Soil	M23-Se0014546	X		
38	BH49_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014547	X		
39	BH49_1.9-2.0	Sep 04, 2023		Soil	M23-Se0014548	X		
40	BH49_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014549	X		

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Project ID: 12611126

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
41	BH50_0.65-0.75	Sep 04, 2023		Soil	M23-Se0014550	X		
42	BH50_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014551	X		
43	BH51_0.5-0.6	Sep 04, 2023		Soil	M23-Se0014552	X		
44	BH51_0.9-1.0	Sep 04, 2023		Soil	M23-Se0014553	X		
45	BH51_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014554	X		
46	BH51_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014555	X		
47	BH52_0.3-0.4	Sep 04, 2023		Soil	M23-Se0014556	X		
48	BH52_0.9-1.0	Sep 04, 2023		Soil	M23-Se0014557	X		
49	BH52_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014558	X		
50	BH52_1.9-2.0	Sep 04, 2023		Soil	M23-Se0014559	X		
51	BH52_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014560	X		
52	BH53_0.25-0.35	Sep 04, 2023		Soil	M23-Se0014561	X		
53	BH53_1.1-1.2	Sep 04, 2023		Soil	M23-Se0014562	X		
54	BH53_1.6-1.7	Sep 04, 2023		Soil	M23-Se0014563	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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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
55	BH53_2.1-2.2	Sep 04, 2023		Soil	M23-Se0014564	X		
56	BH53_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014565	X		
57	BH54_0.3-0.4	Sep 04, 2023		Soil	M23-Se0014566	X		
58	BH54_0.9-1.0	Sep 04, 2023		Soil	M23-Se0014567	X		
59	BH54_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014568	X		
60	BH54_1.9-2.0	Sep 04, 2023		Soil	M23-Se0014569	X		
61	BH55_0.15-0.25	Sep 04, 2023		Soil	M23-Se0014570	X		
62	BH55_0.75-0.85	Sep 04, 2023		Soil	M23-Se0014571	X		
63	BH55_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014572	X		
64	BH55_1.9-2.0	Sep 04, 2023		Soil	M23-Se0014573	X		
65	BH55_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014574	X		
66	BH56_0.2-0.3	Sep 04, 2023		Soil	M23-Se0014575	X		
67	BH56_0.4-0.5	Sep 04, 2023		Soil	M23-Se0014576	X		
68	BH56_0.9-1.0	Sep 04, 2023		Soil	M23-Se0014577	X		

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
69	BH56_1.4-1.5	Sep 04, 2023		Soil	M23-Se0014578	X		
70	BH56_1.9-2.0	Sep 04, 2023		Soil	M23-Se0014579	X		
71	BH56_2.4-2.5	Sep 04, 2023		Soil	M23-Se0014580	X		
72	BH57_0.4-0.5	Sep 05, 2023		Soil	M23-Se0014581	X		
73	BH57_0.7-0.8	Sep 05, 2023		Soil	M23-Se0014582	X		
74	BH57_1.9-2.0	Sep 05, 2023		Soil	M23-Se0014583	X		
75	BH57_2.9-3.0	Sep 05, 2023		Soil	M23-Se0014584	X		
76	BH57_3.9-4.0	Sep 05, 2023		Soil	M23-Se0014585	X		
77	BH57_4.9-5.0	Sep 05, 2023		Soil	M23-Se0014586	X		
78	BH58_0.3-0.4	Sep 05, 2023		Soil	M23-Se0014587	X		
79	BH58_0.5-0.6	Sep 05, 2023		Soil	M23-Se0014588	X		
80	BH58_0.75-0.85	Sep 05, 2023		Soil	M23-Se0014589	X		
81	BH58_1.5-1.6	Sep 05, 2023		Soil	M23-Se0014590	X		
82	BH58_2.1-2.3	Sep 05, 2023		Soil	M23-Se0014591	X		
83	BH58_2.9-3.0	Sep 05, 2023		Soil	M23-Se0014592	X		

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Sample Detail						HOLD	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
84	BH59_0.3-0.4	Sep 05, 2023		Soil	M23-Se0014593	X		
85	BH59_0.6-0.7	Sep 05, 2023		Soil	M23-Se0014594	X		
86	BH59_0.95-1.05	Sep 05, 2023		Soil	M23-Se0014595	X		
87	BH59_1.3-1.4	Sep 05, 2023		Soil	M23-Se0014596	X		
88	BH59_1.9-2.0	Sep 05, 2023		Soil	M23-Se0014597	X		
89	BH59_2.4-2.5	Sep 05, 2023		Soil	M23-Se0014598	X		
90	BH60_0.4-0.5	Sep 05, 2023		Soil	M23-Se0014599	X		
91	BH60_0.9-1.0	Sep 05, 2023		Soil	M23-Se0014600	X		
92	BH60_1.3-1.4	Sep 05, 2023		Soil	M23-Se0014601	X		
93	BH60_1.6-1.7	Sep 05, 2023		Soil	M23-Se0014602	X		
94	BH60_2.4-2.5	Sep 05, 2023		Soil	M23-Se0014603	X		
95	BH61_0.05-0.15	Sep 05, 2023		Soil	M23-Se0014604	X		
96	BH61_0.5-0.6	Sep 05, 2023		Soil	M23-Se0014605	X		
97	BH61_1.15-1.25	Sep 05, 2023		Soil	M23-Se0014606	X		

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
98	BH61_1.9-2.0	Sep 05, 2023		Soil	M23-Se0014607	X		
99	BH61_2.4-2.5	Sep 05, 2023		Soil	M23-Se0014608	X		
100	BH62_0.2-0.3	Sep 05, 2023		Soil	M23-Se0014609	X		
101	BH62_0.8-0.9	Sep 05, 2023		Soil	M23-Se0014610	X		
102	BH62_1.4-1.5	Sep 05, 2023		Soil	M23-Se0014611	X		
103	BH62_1.9-2.0	Sep 05, 2023		Soil	M23-Se0014612	X		
104	BH63_0.01-0.11	Sep 05, 2023		Soil	M23-Se0014613	X		
105	BH63_0.1-0.2	Sep 05, 2023		Soil	M23-Se0014614	X		
106	BH63_0.4-0.53	Sep 05, 2023		Soil	M23-Se0014615	X		
107	BH63_1.15-1.25	Sep 05, 2023		Soil	M23-Se0014616	X		
108	BH63_1.4-1.5	Sep 05, 2023		Soil	M23-Se0014617	X		
109	BH63_2.4-2.5	Sep 05, 2023		Soil	M23-Se0014618	X		
110	BH64_0.15-0.25	Sep 05, 2023		Soil	M23-Se0014619	X		
111	BH64_0.75-	Sep 05, 2023		Soil	M23-Se0014620	X		

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Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
111	BH64_0.75-0.85	Sep 05, 2023		Soil	M23-Se0014620			
112	BH64_1.4-1.5	Sep 05, 2023		Soil	M23-Se0014621	X		
113	BH64_1.9-2.0	Sep 05, 2023		Soil	M23-Se0014622	X		
114	BH64_2.4-2.5	Sep 05, 2023		Soil	M23-Se0014623	X		
115	BH65_0.3-0.4	Sep 05, 2023		Soil	M23-Se0014624	X		
116	BH65_0.9-1.0	Sep 05, 2023		Soil	M23-Se0014625	X		
117	BH65_1.4-1.5	Sep 05, 2023		Soil	M23-Se0014626	X		
118	BH65_1.9-2.0	Sep 05, 2023		Soil	M23-Se0014627	X		
119	BH50_1.9-2.0	Sep 05, 2023		Soil	M23-Se0014965	X		
Test Counts						88	29	31

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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)	%	78			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	81			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	79			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	88			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	83			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	79			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	87			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	92			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	84			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	86			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	85			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	87			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	85			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	81			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	97			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	87			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	90			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	90			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	91			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	78			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	81			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	84			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	83			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	108			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	88			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	86			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	82			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)	%	89			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	78			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-Se0014518	CP	%	91			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0014518	CP	%	94			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0014518	CP	%	90			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0014518	CP	%	95			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0014518	CP	%	92			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0014518	CP	%	90			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0014518	CP	%	99			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0014518	CP	%	100			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0014518	CP	%	93			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0014518	CP	%	98			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0014518	CP	%	100			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Se0014518	CP	%	106			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0014518	CP	%	99			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0014518	CP	%	100			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0014518	CP	%	110			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0014518	CP	%	102			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-Se0014518	CP	%	104			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0014518	CP	%	100			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Se0014518	CP	%	99			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0014518	CP	%	101			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0014518	CP	%	91			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0014518	CP	%	102			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0014518	CP	%	106			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0014518	CP	%	144			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0014518	CP	%	98			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0014518	CP	%	118			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-Se0014518	CP	%	93			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0014518	CP	%	99			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0014518	CP	%	99			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0014518	CP	%	93			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	M23-Se0014530	CP	%	101			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0014530	CP	%	73			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0014530	CP	%	99			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0014530	CP	%	102			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0014530	CP	%	100			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0014530	CP	%	113			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0014530	CP	%	112			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0014530	CP	%	112			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0014530	CP	%	108			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0014530	CP	%	130			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0014530	CP	%	104			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Se0014530	CP	%	104			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0014530	CP	%	114			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0014530	CP	%	98			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-Se0014530	CP	%	104			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0014530	CP	%	100			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0014530	CP	%	85			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0014530	CP	%	105			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Se0014530	CP	%	88			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0014530	CP	%	110			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0014530	CP	%	79			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0014530	CP	%	82			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0014530	CP	%	95			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0014530	CP	%	91			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0014530	CP	%	90			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0014530	CP	%	113			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-Se0014530	CP	%	95			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0014530	CP	%	101			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0014530	CP	%	107			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0014530	CP	%	97			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-Se0014511	CP	%	17	17	2.8	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0014514	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0014514	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0014514	CP	ug/kg	9.0	10	13	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0014514	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-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0014514	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0014514	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0014519	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0014519	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0014519	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-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0014519	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0014519	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-Se0014522	CP	%	15	16	8.1	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	M23-Se0014532	CP	%	19	19	2.8	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
Carroll Lee	Senior Analyst-PFAS
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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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
Adelaide
SA 5001

Project Name: MFS OAKDEN DSI
Project ID: 12611126

Order No.:
Report #: 1025806
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 13, 2023 4:03 PM
Due: Sep 20, 2023
Priority: 5 Day
Contact Name: Terrance Wilson

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						AUS Leaching Procedure	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH50_1.4-1.5	Sep 04, 2023		Soil	M23-Se0030658		X	X
2	BH51_0.9-1.0	Sep 04, 2023		Soil	M23-Se0030659		X	X
3	BH57_2.9-3.0	Sep 05, 2023		Soil	M23-Se0030660		X	X
4	BH58_2.1-2.3	Sep 05, 2023		Soil	M23-Se0030661		X	X
5	BH63_1.4-1.5	Sep 05, 2023		Soil	M23-Se0030662		X	X
6	BH64_1.4-1.5	Sep 05, 2023		Soil	M23-Se0030663		X	X
7	BH65_1.9-2.0	Sep 05, 2023		Soil	M23-Se0030664		X	X
8	BH26_0.4-0.5	Aug 24, 2023		AUS Leachate	M23-Se0030665	X		X
9	BH51_0.9-1.0	Sep 04, 2023		AUS Leachate	M23-Se0030666	X		X
10	BH52_0.01-0.15	Sep 04, 2023		AUS Leachate	M23-Se0030667	X		X
11	BH53_0.01-0.15	Sep 04, 2023		AUS Leachate	M23-Se0030668	X		X
12	BH64_0.01-0.1	Sep 05, 2023		AUS Leachate	M23-Se0030669	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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Site# 2370

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IANZ# 1327	IANZ# 1290	IANZ# 1402

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

Project Name: MFS OAKDEN DSI
Project ID: 12611126

Order No.:
Report #: 1025806
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 13, 2023 4:03 PM
Due: Sep 20, 2023
Priority: 5 Day
Contact Name: Terrance Wilson

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						AUS Leaching Procedure	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
13	BH65_0.01-0.1	Sep 05, 2023		AUS Leachate	M23-Se0030670	X		X
Test Counts						6	7	13

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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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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:	Terrance Wilson
Project name:	MFS OAKDEN DSI
Project ID:	12611126
Turnaround time:	5 Day
Date/Time received	Sep 13, 2023 4:03 PM
Eurofins reference	1025806

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 Terrance Wilson - Terrence.Wilson@ghd.com.

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

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: **Terrance Wilson**

Report **1025806-S**
Project name MFS OAKDEN DSI
Project ID 12611126
Received Date Sep 13, 2023

Client Sample ID			**BH50_1.4-1.5**	**BH51_0.9-1.0**	**BH57_2.9-3.0**	**BH58_2.1-2.3**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**M23-Se0030658**	**M23-Se0030659**	**M23-Se0030660**	**M23-Se0030661**
Date Sampled			**Sep 04, 2023**	**Sep 04, 2023**	**Sep 05, 2023**	**Sep 05, 2023**
Test/Reference	LOR	Unit				
Sample Properties						
% Moisture	1	%	22	19	18	21
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	%	96	94	90	98
13C5-PFPeA (surr.)	1	%	112	101	117	111
13C5-PFHxA (surr.)	1	%	121	136	119	127
13C4-PFHpA (surr.)	1	%	105	113	100	102
13C8-PFOA (surr.)	1	%	112	107	95	109
13C5-PFNA (surr.)	1	%	114	109	112	123
13C6-PFDA (surr.)	1	%	103	104	103	103
13C2-PFUnDA (surr.)	1	%	118	111	107	114
13C2-PFDoDA (surr.)	1	%	121	121	119	118
13C2-PFTeDA (surr.)	1	%	95	103	89	93
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			BH50_1.4-1.5	BH51_0.9-1.0	BH57_2.9-3.0	BH58_2.1-2.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			M23-Se0030658	M23-Se0030659	M23-Se0030660	M23-Se0030661
Date Sampled			Sep 04, 2023	Sep 04, 2023	Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	100	102	101	105
D3-N-MeFOSA (surr.)	1	%	105	96	100	102
D5-N-EtFOSA (surr.)	1	%	103	101	98	102
D7-N-MeFOSE (surr.)	1	%	92	92	91	95
D9-N-EtFOSE (surr.)	1	%	97	95	96	99
D5-N-EtFOSAA (surr.)	1	%	119	111	106	111
D3-N-MeFOSAA (surr.)	1	%	122	117	115	118
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	< 5	< 5	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	< 5	< 5	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	111	115	114	114
18O2-PFHxS (surr.)	1	%	121	117	128	113
13C8-PFOS (surr.)	1	%	104	106	107	109
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	%	104	102	101	110
13C2-6:2 FTSA (surr.)	1	%	93	91	92	98
13C2-8:2 FTSA (surr.)	1	%	101	109	104	115
13C2-10:2 FTSA (surr.)	1	%	127	114	114	123
PFASs Summations						
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	< 5	< 5	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	< 10	< 10	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	< 50	< 50	< 50

Client Sample ID			BH63_1.4-1.5	BH64_1.4-1.5	BH65_1.9-2.0
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M23-Se0030662	M23-Se0030663	M23-Se0030664
Date Sampled			Sep 05, 2023	Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit			
Sample Properties					
% Moisture	1	%	13	20	20
Perfluoroalkyl carboxylic acids (PFCAs)					
Perfluorobutanoic acid (PFBA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoropentanoic acid (PFPeA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorohexanoic acid (PFHxA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroheptanoic acid (PFHpA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorooctanoic acid (PFOA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorononanoic acid (PFNA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorodecanoic acid (PFDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluoroundecanoic acid (PFUnDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorododecanoic acid (PFDoDA)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	< 5	< 5	< 5
13C4-PFBA (surr.)	1	%	86	103	90
13C5-PFPeA (surr.)	1	%	107	110	102
13C5-PFHxA (surr.)	1	%	122	130	119
13C4-PFHpA (surr.)	1	%	108	109	108
13C8-PFOA (surr.)	1	%	107	118	106
13C5-PFNA (surr.)	1	%	137	112	109
13C6-PFDA (surr.)	1	%	102	96	102
13C2-PFUnDA (surr.)	1	%	117	129	114
13C2-PFDoDA (surr.)	1	%	104	122	121
13C2-PFTeDA (surr.)	1	%	91	100	104
Perfluoroalkyl sulfonamido substances					
Perfluorooctane sulfonamide (FOSA)[N11]	5	ug/kg	< 5	< 5	< 5
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)[N11]	5	ug/kg	< 5	< 5	< 5
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)[N11]	5	ug/kg	< 5	< 5	< 5
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)[N11]	5	ug/kg	< 5	< 5	< 5
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)[N11]	5	ug/kg	< 5	< 5	< 5
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)[N11]	10	ug/kg	< 10	< 10	< 10
13C8-FOSA (surr.)	1	%	104	99	104
D3-N-MeFOSA (surr.)	1	%	99	101	99
D5-N-EtFOSA (surr.)	1	%	103	104	97
D7-N-MeFOSE (surr.)	1	%	97	94	95
D9-N-EtFOSE (surr.)	1	%	101	97	96
D5-N-EtFOSAA (surr.)	1	%	108	130	118
D3-N-MeFOSAA (surr.)	1	%	112	135	122
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorobutanesulfonic acid (PFBS)[N11]	5	ug/kg	< 5	< 5	< 5
Perfluorononanesulfonic acid (PFNS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluoropropanesulfonic acid (PFPrS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluoropentanesulfonic acid (PFPeS)[N15]	5	ug/kg	< 5	< 5	< 5
Perfluorohexanesulfonic acid (PFHxS)[N11]	5	ug/kg	< 5	[N09]38	< 5
Perfluoroheptanesulfonic acid (PFHpS)[N15]	5	ug/kg	< 5	[N09]19	< 5

Client Sample ID			BH63_1.4-1.5	BH64_1.4-1.5	BH65_1.9-2.0
Sample Matrix			Soil	Soil	Soil
Eurofins Sample No.			M23-Se0030662	M23-Se0030663	M23-Se0030664
Date Sampled			Sep 05, 2023	Sep 05, 2023	Sep 05, 2023
Test/Reference	LOR	Unit			
Perfluoroalkyl sulfonic acids (PFSAs)					
Perfluorooctanesulfonic acid (PFOS)[N11]	5	ug/kg	< 5	[N09]83	< 5
Perfluorodecanesulfonic acid (PFDS)[N15]	5	ug/kg	< 5	< 5	< 5
13C3-PFBS (surr.)	1	%	118	109	117
18O2-PFHxS (surr.)	1	%	118	117	119
13C8-PFOS (surr.)	1	%	107	101	105
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)					
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)[N11]	10	ug/kg	< 10	< 10	< 10
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)[N11]	5	ug/kg	< 5	< 5	< 5
13C2-4:2 FTSA (surr.)	1	%	101	113	101
13C2-6:2 FTSA (surr.)	1	%	95	99	105
13C2-8:2 FTSA (surr.)	1	%	99	98	96
13C2-10:2 FTSA (surr.)	1	%	122	132	134
PFASs Summations					
Sum (PFHxS + PFOS)*	5	ug/kg	< 5	121	< 5
Sum of US EPA PFAS (PFOS + PFOA)*	5	ug/kg	< 5	83	< 5
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	5	ug/kg	< 5	121	< 5
Sum of WA DWER PFAS (n=10)*	10	ug/kg	< 10	121	< 10
Sum of PFASs (n=30)*	50	ug/kg	< 50	140	< 50

Sample History

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

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

Description	Testing Site	Extracted	Holding Time
% Moisture	Melbourne	Sep 13, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Melbourne	Sep 13, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Melbourne	Sep 13, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Melbourne	Sep 13, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Melbourne	Sep 13, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Melbourne	Sep 13, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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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
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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
Adelaide
SA 5001

Project Name: MFS OAKDEN DSI
Project ID: 12611126

Order No.:
Report #: 1025806
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 13, 2023 4:03 PM
Due: Sep 20, 2023
Priority: 5 Day
Contact Name: Terrance Wilson

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						AUS Leaching Procedure	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	BH50_1.4-1.5	Sep 04, 2023		Soil	M23-Se0030658		X	X
2	BH51_0.9-1.0	Sep 04, 2023		Soil	M23-Se0030659		X	X
3	BH57_2.9-3.0	Sep 05, 2023		Soil	M23-Se0030660		X	X
4	BH58_2.1-2.3	Sep 05, 2023		Soil	M23-Se0030661		X	X
5	BH63_1.4-1.5	Sep 05, 2023		Soil	M23-Se0030662		X	X
6	BH64_1.4-1.5	Sep 05, 2023		Soil	M23-Se0030663		X	X
7	BH65_1.9-2.0	Sep 05, 2023		Soil	M23-Se0030664		X	X
8	BH26_0.4-0.5	Aug 24, 2023		AUS Leachate	M23-Se0030665	X		X
9	BH51_0.9-1.0	Sep 04, 2023		AUS Leachate	M23-Se0030666	X		X
10	BH52_0.01-0.15	Sep 04, 2023		AUS Leachate	M23-Se0030667	X		X
11	BH53_0.01-0.15	Sep 04, 2023		AUS Leachate	M23-Se0030668	X		X
12	BH64_0.01-0.1	Sep 05, 2023		AUS Leachate	M23-Se0030669	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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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 OAKDEN DSI
Project ID: 12611126

Order No.:
Report #: 1025806
Phone: 08 8111 6600
Fax: 08 8111 6699

Received: Sep 13, 2023 4:03 PM
Due: Sep 20, 2023
Priority: 5 Day
Contact Name: Terrance Wilson

Eurofins Analytical Services Manager : Amy Meunier

Sample Detail						AUS Leaching Procedure	Moisture Set	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254						X	X	X
13	BH65_0.01-0.1	Sep 05, 2023		AUS Leachate	M23-Se0030670	X		X
Test Counts						6	7	13

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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)	%	89			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	77			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	92			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	93			50-150	Pass	
Perfluorooctanoic acid (PFOA)	%	102			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	98			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	91			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	105			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	104			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	99			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	94			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	97			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	101			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	92			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	87			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	87			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	84			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	90			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	80			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	100			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	78			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	73			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	86			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	80			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	88			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	99			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	102			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	81			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	93			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-Se0030445	NCP	%	97			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0030445	NCP	%	83			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0030445	NCP	%	114			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0030445	NCP	%	95			50-150	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0030446	NCP	%	108			50-150	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0030445	NCP	%	105			50-150	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0030445	NCP	%	104			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0030445	NCP	%	107			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0030445	NCP	%	106			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0030445	NCP	%	99			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0030445	NCP	%	101			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	M23-Se0030445	NCP	%	100			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0030445	NCP	%	106			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0030445	NCP	%	91			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0030445	NCP	%	92			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0030445	NCP	%	94			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-Se0030445	NCP	%	88			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0030445	NCP	%	103			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	M23-Se0030445	NCP	%	80			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0030445	NCP	%	142			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0030445	NCP	%	74			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0030445	NCP	%	73			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0030445	NCP	%	100			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0030445	NCP	%	115			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0030446	NCP	%	88			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0030445	NCP	%	149			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-Se0030445	NCP	%	96			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0030445	NCP	%	92			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0030445	NCP	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0030445	NCP	%	101			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-Se0029251	NCP	%	18	19	7.6	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorododecanoic acid (PFDoDA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	M23-Se0030760	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	M23-Se0030760	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanesulfonic acid (PFNS)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	M23-Se0030760	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-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	M23-Se0030760	NCP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	M23-Se0030760	NCP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	M23-Se0030760	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
Carroll Lee	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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CERTIFICATE OF ANALYSIS

Work Order	: **EM2312852**	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	: 12611126	Date Samples Received	: 17-Jul-2023 12:15
Order number	: ----	Date Analysis Commenced	: 18-Jul-2023
C-O-C number	: ----	Issue Date	: 20-Jul-2023 14:26
Sampler	: Terrence Wilson		
Site	:		
Quote number	: EN/005		
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*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Sanjay Parekh	LCMS Coordinator	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 EM2312851-068 due to sample matrix interference.
- 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	FS01	----	----	----	----
				Sampling date / time	14-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2312852-001	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**16.4**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0003**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0609**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		**0.0005**	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0003**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS01	----	----	----	----
				Sampling date / time	14-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2312852-001	--------	--------	--------	--------
					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		**0.0620**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0612**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0615**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**121**	----	----	----	----
13C8-PFOA	----	0.0002	%		**95.5**	----	----	----	----

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	: **EM2312852**	Page	: 1 of 6
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	: 12611126	Date Samples Received	: 17-Jul-2023
Order number	: ----	Date Analysis Commenced	: 18-Jul-2023
C-O-C number	: ----	Issue Date	: 20-Jul-2023
Sampler	: Terrence Wilson		
Site	:		
Quote number	: EN/005		
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*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Sanjay Parekh	LCMS Coordinator	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: 5178459)									
EM2312816-001	Anonymous	EA055: Moisture Content	----	0.1	%	11.6	10.7	8.2	0% - 50%
EM2312851-075	Anonymous	EA055: Moisture Content	----	0.1	%	33.0	34.6	4.9	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5178205)									
EM2312847-001	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	0.0003	0.0006	56.8	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: 5178205)									
EM2312847-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<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: 5178205)									
EM2312847-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5178205) - continued									
EM2312847-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5178205)									
EM2312847-001	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
EP231P: PFAS Sums (QC Lot: 5178205)									
EM2312847-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0003	0.0006	66.7	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0003	0.0006	66.7	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0003	0.0006	66.7	No Limit

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

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

Sub-Matrix: **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: 5178205)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	80.0	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	90.2	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	83.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	106	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	93.1	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	93.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5178205)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	78.0	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.6	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.5	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.8	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.8	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.9	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	75.6	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.8	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	71.0	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	109	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5178205)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.4	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	92.4	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	84.7	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.4	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5178205)								

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: 5178205) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	95.8	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	93.1	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	93.2	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	90.2	70.0	130
EP231P: PFAS Sums (QCLot: 5178205)								
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: 5178205)							
EM2312851-068	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	# 71.7	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	93.7	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	82.5	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	104	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	# Not Determined	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	75.5	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5178205)							
EM2312851-068	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	# 66.6	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	# 59.6	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	80.5	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	71.9	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	# 53.8	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	75.7	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	70.5	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	99.6	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	71.0	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	76.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	122	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: 5178205)							
EM2312851-068	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	101	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	81.4	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	84.0	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	100	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	105	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	# Not Determined	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	67.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5178205)							
EM2312851-068	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	86.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	86.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	# 53.9	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2312852**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Telephone	: +6138549 9645
Project	: 12611126	Date Samples Received	: 17-Jul-2023
Site	:	Issue Date	: 20-Jul-2023
Sampler	: Terrence Wilson	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.**
- **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
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EM2312851--068	Anonymous	**Perfluorobutane sulfonic acid (PFBS)**	375-73-5	71.7 %	72.0-128%	**Recovery less than lower data quality objective**
EP231A: Perfluoroalkyl Sulfonic Acids	EM2312851--068	Anonymous	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2312851--068	Anonymous	**Perfluorobutanoic acid (PFBA)**	375-22-4	66.6 %	71.0-135%	**Recovery less than lower data quality objective**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2312851--068	Anonymous	**Perfluoropentanoic acid (PFPeA)**	2706-90-3	59.6 %	69.0-132%	**Recovery less than lower data quality objective**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2312851--068	Anonymous	**Perfluorooctanoic acid (PFOA)**	335-67-1	53.8 %	69.0-133%	**Recovery less than lower data quality objective**
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2312851--068	Anonymous	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	53.9 %	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)							
FS01	**14-Jul-2023**	**----**	----	----	**18-Jul-2023**	28-Jul-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
FS01	**14-Jul-2023**	**18-Jul-2023**	10-Jan-2024	✓	**19-Jul-2023**	27-Aug-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
FS01	**14-Jul-2023**	**18-Jul-2023**	10-Jan-2024	✓	**19-Jul-2023**	27-Aug-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
FS01	**14-Jul-2023**	**18-Jul-2023**	10-Jan-2024	✓	**19-Jul-2023**	27-Aug-2023	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
FS01	**14-Jul-2023**	**18-Jul-2023**	10-Jan-2024	✓	**19-Jul-2023**	27-Aug-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
FS01	**14-Jul-2023**	**18-Jul-2023**	10-Jan-2024	✓	**19-Jul-2023**	27-Aug-2023	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

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

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	: **EM2313267**	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	: 12611126	Date Samples Received	: 21-Jul-2023 10:45
Order number	: 12611126	Date Analysis Commenced	: 24-Jul-2023
C-O-C number	: ----	Issue Date	: 28-Jul-2023 13:13
Sampler	: Terrence Wilson		
Site	: ----		
Quote number	: MEBQ/005/21 (Vic Only, Primary)		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Jarwis Nheu	Non-Metals Team Leader	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 EM2313077-002 due to sample matrix interference.
- 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	FS02	FS03	FS04	----	----
				Sampling date / time	18-Jul-2023 00:00	18-Jul-2023 00:00	19-Jul-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2313267-001	EM2313267-002	EM2313267-003	--------	--------
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**7.6**	**19.0**	**24.2**	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	**0.0006**	**0.0043**	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	**0.0004**	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0006**	**0.0215**	**0.0755**	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	**0.0004**	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	**0.0003**	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	**0.0004**	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	**0.0003**	**0.0006**	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	**0.0002**	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	**0.0004**	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS02	FS03	FS04	----	----
				Sampling date / time	18-Jul-2023 00:00	18-Jul-2023 00:00	19-Jul-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2313267-001	EM2313267-002	EM2313267-003	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	**0.0005**	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		**0.0026**	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0032**	**0.0229**	**0.0825**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0006**	**0.0221**	**0.0798**	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0032**	**0.0224**	**0.0811**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**104**	**89.5**	**107**	----	----
13C8-PFOA	----	0.0002	%		**103**	**94.0**	**93.0**	----	----

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	: **EM2313267**	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	: 12611126	Date Samples Received	: 21-Jul-2023
Order number	: 12611126	Date Analysis Commenced	: 24-Jul-2023
C-O-C number	: ----	Issue Date	: 28-Jul-2023
Sampler	: Terrence Wilson		
Site	: ----		
Quote number	: MEBQ/005/21 (Vic Only, Primary)		
No. of samples received	: 3		
No. of samples analysed	: 3		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Jarwis Nheu	Non-Metals Team Leader	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: 5189645)									
EM2313077-001	Anonymous	EA055: Moisture Content	----	0.1	%	24.2	23.8	1.3	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5196060)									
EM2313077-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0008	0.0003	85.1	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0009	0.0003	98.2	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0108	# 0.0051	71.6	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0007	0.0002	92.5	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0613	0.0555	9.8	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0013	0.0011	12.1	No Limit
EM2313308-002	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: 5196060)									
EM2313077-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0020	0.0021	0.0	0% - 50%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0029	0.0019	39.1	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0013	0.0015	10.6	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0020	0.0018	12.4	0% - 50%
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0011	0.0014	17.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0003	0.0003	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0005	0.0005	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: 5196060) - continued									
EM2313077-001	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
EM2313308-002	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: 5196060)									
EM2313077-001	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
EM2313308-002	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: 5196060)									

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: 5196060) - continued									
EM2313077-001	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
EM2313308-002	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: 5196060)									
EM2313077-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0869	0.0730	17.4	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0721	0.0606	17.3	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0821	0.0692	17.1	0% - 20%
EM2313308-002	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: 5196060)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	121	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	80.5	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	98.1	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	77.4	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	90.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	68.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5196060)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	86.1	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.1	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.4	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.7	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.3	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.3	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.3	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	88.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5196060)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.0	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	107	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	113	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	79.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	82.4	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5196060)								

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: 5196060) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	96.8	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	96.0	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	108	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	120	70.0	130
EP231P: PFAS Sums (QCLot: 5196060)								
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: 5196060)							
EM2313077-002	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	# Not Determined	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	# Not Determined	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	# Not Determined	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	# Not Determined	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	70.7	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5196060)							
EM2313077-002	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	80.7	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	# Not Determined	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	# Not Determined	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	# 42.5	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	# Not Determined	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*
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5196060) - continued							
EM2313077-002	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	89.2	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	98.4	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	83.4	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	100.0	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	91.4	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	89.9	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5196060)							
EM2313077-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	77.6	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	98.7	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	102	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	87.5	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	82.3	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	79.0	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	69.5	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5196060)							
EM2313077-002	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	93.6	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	110	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	95.6	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	103	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2313267**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Telephone	: +6138549 9645
Project	: 12611126	Date Samples Received	: 21-Jul-2023
Site	: ----	Issue Date	: 28-Jul-2023
Sampler	: Terrence Wilson	No. of samples received	: 3
Order number	: 12611126	No. of samples analysed	: 3

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO 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	EM2313077--001	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	71.6 %	0% - 20%	**RPD exceeds LOR based limits**
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EM2313077--002	Anonymous	**Perfluorohexane sulfonic acid (PFHxS)**	355-46-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231A: Perfluoroalkyl Sulfonic Acids	EM2313077--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.**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2313077--002	Anonymous	**Perfluorohexanoic acid (PFHxA)**	307-24-4	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EP231B: Perfluoroalkyl Carboxylic Acids	EM2313077--002	Anonymous	**Perfluoroheptanoic acid (PFHpA)**	375-85-9	42.5 %	71.0-131%	**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) FS02, FS03	**18-Jul-2023**	**----**	----	**----**	**24-Jul-2023**	01-Aug-2023	✓
HDPE Soil Jar (EA055) FS04	**19-Jul-2023**	**----**	----	**----**	**24-Jul-2023**	02-Aug-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) FS02, FS03	**18-Jul-2023**	**26-Jul-2023**	14-Jan-2024	✓	**27-Jul-2023**	04-Sep-2023	✓
HDPE Soil Jar (EP231X) FS04	**19-Jul-2023**	**26-Jul-2023**	15-Jan-2024	✓	**27-Jul-2023**	04-Sep-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
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) FS02, FS03	**18-Jul-2023**	**26-Jul-2023**	14-Jan-2024	✓	**27-Jul-2023**	04-Sep-2023	✓
HDPE Soil Jar (EP231X) FS04	**19-Jul-2023**	**26-Jul-2023**	15-Jan-2024	✓	**27-Jul-2023**	04-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) FS02, FS03	**18-Jul-2023**	**26-Jul-2023**	14-Jan-2024	✓	**27-Jul-2023**	04-Sep-2023	✓
HDPE Soil Jar (EP231X) FS04	**19-Jul-2023**	**26-Jul-2023**	15-Jan-2024	✓	**27-Jul-2023**	04-Sep-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) FS02, FS03	**18-Jul-2023**	**26-Jul-2023**	14-Jan-2024	✓	**27-Jul-2023**	04-Sep-2023	✓
HDPE Soil Jar (EP231X) FS04	**19-Jul-2023**	**26-Jul-2023**	15-Jan-2024	✓	**27-Jul-2023**	04-Sep-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) FS02, FS03	**18-Jul-2023**	**26-Jul-2023**	14-Jan-2024	✓	**27-Jul-2023**	04-Sep-2023	✓
HDPE Soil Jar (EP231X) FS04	**19-Jul-2023**	**26-Jul-2023**	15-Jan-2024	✓	**27-Jul-2023**	04-Sep-2023	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **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	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
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	: **EM2313731**	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	: 12611126	Date Samples Received	: 31-Jul-2023 11:30
Order number	: ----	Date Analysis Commenced	: 31-Jul-2023
C-O-C number	: ----	Issue Date	: 03-Aug-2023 16:18
Sampler	: Terrence Wilson		
Site	:		
Quote number	: EN/005		
No. of samples received	: 2		
No. of samples analysed	: 2		

Accreditation No. 825
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This 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*
Dilani Fernando	Laboratory Coordinator	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	FS06	----	----	----
				Sampling date / time	24-Jul-2023 00:00	24-Jul-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2313731-001	EM2313731-002	--------	--------	--------
					Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**3.6**	**6.2**	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		**0.0077**	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		**0.0050**	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0466**	**0.0004**	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0045**	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.124**	**0.0053**	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		**0.0004**	**0.0007**	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		**0.002**	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0041**	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0189**	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0015**	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0034**	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		**0.0008**	<0.0002	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS05	FS06	----	----	----
				Sampling date / time	24-Jul-2023 00:00	24-Jul-2023 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EM2313731-001	EM2313731-002	--------	--------	--------
					Result	Result	----	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	**0.0012**	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.219**	**0.0076**	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.171**	**0.0057**	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.208**	**0.0069**	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**116**	**106**	----	----	----
13C8-PFOA	----	0.0002	%		**98.4**	**102**	----	----	----

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	: **EM2313731**	Page	: 1 of 6
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	: 12611126	Date Samples Received	: 31-Jul-2023
Order number	: ----	Date Analysis Commenced	: 31-Jul-2023
C-O-C number	: ----	Issue Date	: 03-Aug-2023
Sampler	: Terrence Wilson		
Site	:		
Quote number	: EN/005		
No. of samples received	: 2		
No. of samples analysed	: 2		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Dilani Fernando	Laboratory Coordinator	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

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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: 5205353)									
EM2313681-001	Anonymous	EA055: Moisture Content	----	0.1	%	14.3	15.4	7.2	0% - 20%
EM2313726-003	Anonymous	EA055: Moisture Content	----	0.1	%	32.5	37.1	13.2	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5207497)									
EM2313731-001	FS05	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0077	0.0071	7.2	0% - 20%
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	0.0050	0.0047	6.0	0% - 20%
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0466	0.0402	14.8	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	0.0045	0.0039	13.1	0% - 20%
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.124	0.102	18.9	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0004	0.0002	43.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5207497)									
EM2313731-001	FS05	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0041	0.0035	14.7	0% - 20%
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0189	0.0157	18.7	0% - 20%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0015	0.0013	12.5	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0034	0.0029	15.8	0% - 50%
		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	0.002	0.002	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5207497)									
EM2313731-001	FS05	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0008	0.0007	16.5	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5207497) - continued									
EM2313731-001	FS05	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: 5207497)									
EM2313731-001	FS05	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: 5207497)									
EM2313731-001	FS05	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.219	0.184	17.2	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.171	0.142	18.2	0% - 20%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.208	0.175	17.5	0% - 20%

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

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

Sub-Matrix: **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: 5207497)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	88.2	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	99.8	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	87.6	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	97.3	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	95.6	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	102	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5207497)								
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	92.2	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.3	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.6	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.8	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.3	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5207497)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	96.0	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	98.9	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.6	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5207497)								

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: 5207497) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	97.4	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	95.7	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	102	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: 5207497)								
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: 5207497)							
EM2313731-002	FS06	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	79.5	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	77.1	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	74.7	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	88.8	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	101	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5207497)							
EM2313731-002	FS06	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	83.5	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	88.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	87.2	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	90.4	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	92.5	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	90.8	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	85.0	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	91.4	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	93.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	92.0	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	92.0	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: 5207497)							
EM2313731-002	FS06	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	77.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	83.8	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	104	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	85.2	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	97.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	89.5	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	83.8	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5207497)							
EM2313731-002	FS06	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	94.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	98.1	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	104	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	74.3	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2313731**	Page	: 1 of 4
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Telephone	: +6138549 9645
Project	: 12611126	Date Samples Received	: 31-Jul-2023
Site	:	Issue Date	: 03-Aug-2023
Sampler	: Terrence Wilson	No. of samples received	: 2
Order number	: ----	No. of samples analysed	: 2

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EP231A: Perfluoroalkyl Sulfonic Acids	EM2313731--002	FS06	**Perfluorooctane sulfonic acid (PFOS)**	1763-23-1	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**

Analysis Holding Time Compliance

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

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

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

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

Matrix: **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,	FS06	**24-Jul-2023**	**----**	----	**----**	**31-Jul-2023**	07-Aug-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X)								
FS05,	FS06	**24-Jul-2023**	**01-Aug-2023**	20-Jan-2024	✓	**02-Aug-2023**	10-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
FS05,	FS06	**24-Jul-2023**	**01-Aug-2023**	20-Jan-2024	✓	**02-Aug-2023**	10-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
FS05,	FS06	**24-Jul-2023**	**01-Aug-2023**	20-Jan-2024	✓	**02-Aug-2023**	10-Sep-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
FS05,	FS06	**24-Jul-2023**	**01-Aug-2023**	20-Jan-2024	✓	**02-Aug-2023**	10-Sep-2023	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
FS05,	FS06	**24-Jul-2023**	**01-Aug-2023**	20-Jan-2024	✓	**02-Aug-2023**	10-Sep-2023	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **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	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
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	: **EM2313574**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: Terrence Wilson	Contact	: Shirley LeCornu
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9630
Project	: 12611126	Date Samples Received	: 27-Jul-2023 11:30
Order number	: 12611126	Date Analysis Commenced	: 28-Jul-2023
C-O-C number	: ----	Issue Date	: 01-Aug-2023 15:17
Sampler	: ----		
Site	: ----		
Quote number	: ME/875/20 B - SECONDARY WORK ONLY		
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*
Eric Chau	Metals Team Leader	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	FS07	----	----	----	----
				Sampling date / time	26-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2313574-001	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**17.1**	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0008**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS07	----	----	----	----
				Sampling date / time	26-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		EM2313574-001	--------	--------	--------	--------
					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		**0.0008**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0008**	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0008**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**108**	----	----	----	----
13C8-PFOA	----	0.0002	%		**93.0**	----	----	----	----

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	: **EM2313574**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: Terrence Wilson	Contact	: Shirley LeCornu
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9630
Project	: 12611126	Date Samples Received	: 27-Jul-2023
Order number	: 12611126	Date Analysis Commenced	: 28-Jul-2023
C-O-C number	: ----	Issue Date	: 01-Aug-2023
Sampler	: ----		
Site	: ----		
Quote number	: ME/875/20 B - SECONDARY WORK ONLY		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Eric Chau	Metals Team Leader	Melbourne Inorganics, Springvale, VIC
Nancy Wang	2IC Organic Chemist	Melbourne Organics, Springvale, VIC

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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: 5200632)									
EM2313559-008	Anonymous	EA055: Moisture Content	----	0.1	%	26.0	26.5	1.8	0% - 20%
EM2313559-018	Anonymous	EA055: Moisture Content	----	0.1	%	21.4	20.3	5.2	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5201073)									
EM2313036-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5201073)									
EM2313036-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<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: 5201073)									
EM2313036-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5201073) - continued									
EM2313036-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5201073)									
EM2313036-001	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
EP231P: PFAS Sums (QC Lot: 5201073)									
EM2313036-001	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

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: 5201073)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	90.3	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	94.7	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	97.5	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	105	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	101	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5201073)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	88.9	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.3	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.3	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.3	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.2	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.0	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	95.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5201073)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.3	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.2	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	94.1	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	103	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	75.6	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5201073)								

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: 5201073) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	92.6	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	99.1	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	99.5	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	93.7	70.0	130
EP231P: PFAS Sums (QCLot: 5201073)								
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: 5201073)							
EM2313036-006	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	99.2	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	88.6	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	87.3	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	93.5	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	101	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	92.4	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5201073)							
EM2313036-006	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	92.0	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	95.8	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	91.8	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	89.7	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	92.8	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	92.4	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	92.4	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	98.5	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	99.2	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	94.5	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	97.2	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5201073)							

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: 5201073) - continued							
EM2313036-006	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	92.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	102	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	100	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	92.9	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	96.5	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	64.8	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	68.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5201073)							
EM2313036-006	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	97.2	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	101	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	89.8	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	94.2	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2313574**	Page	: 1 of 4
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: Terrence Wilson	Telephone	: +6138549 9630
Project	: 12611126	Date Samples Received	: 27-Jul-2023
Site	: ----	Issue Date	: 01-Aug-2023
Sampler	: ----	No. of samples received	: 1
Order number	: 12611126	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
FS07	**26-Jul-2023**	**----**	----	----	**28-Jul-2023**	09-Aug-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X)							
FS07	**26-Jul-2023**	**28-Jul-2023**	22-Jan-2024	✓	**31-Jul-2023**	06-Sep-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X)							
FS07	**26-Jul-2023**	**28-Jul-2023**	22-Jan-2024	✓	**31-Jul-2023**	06-Sep-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X)							
FS07	**26-Jul-2023**	**28-Jul-2023**	22-Jan-2024	✓	**31-Jul-2023**	06-Sep-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X)							
FS07	**26-Jul-2023**	**28-Jul-2023**	22-Jan-2024	✓	**31-Jul-2023**	06-Sep-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X)							
FS07	**26-Jul-2023**	**28-Jul-2023**	22-Jan-2024	✓	**31-Jul-2023**	06-Sep-2023	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
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	: **EM2315510**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: Thomas 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	: 12611126	Date Samples Received	: 29-Aug-2023 11:30
Order number	: ----	Date Analysis Commenced	: 29-Aug-2023
C-O-C number	: ----	Issue Date	: 31-Aug-2023 15:46
Sampler	: EG, JA, LW, NP, TW		
Site	:		
Quote number	: EN/005		
No. of samples received	: 8		
No. of samples analysed	: 8		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Jarwis Nheu	Non-Metals Team Leader	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	FS01	FS02	FS03	FS04	FS05
				Sampling date / time	23-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EM2315510-001	EM2315510-002	EM2315510-003	EM2315510-004	EM2315510-005
					Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**22.7**	**17.7**	**17.8**	**26.2**	**27.5**
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	**0.0052**	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	**0.0038**	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0004**	**0.0212**	<0.0002	**0.0008**	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0014**	**0.0074**	**0.0004**	**0.0026**	**0.0008**
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	**0.0012**	<0.0002	<0.0002	**0.0002**
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	**0.0053**	<0.0002	**0.0008**	**0.0002**
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		<0.0002	**0.0005**	<0.0002	<0.0002	**0.0002**
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS01	FS02	FS03	FS04	FS05
				Sampling date / time	23-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00	24-Aug-2023 00:00
Compound	CAS Number	LOR	Unit		EM2315510-001	EM2315510-002	EM2315510-003	EM2315510-004	EM2315510-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0018**	**0.0454**	**0.0004**	**0.0042**	**0.0014**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0018**	**0.0286**	**0.0004**	**0.0034**	**0.0008**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0018**	**0.0412**	**0.0004**	**0.0042**	**0.0014**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**124**	**96.2**	**109**	**98.8**	**112**
13C8-PFOA	----	0.0002	%		**97.2**	**86.5**	**91.0**	**105**	**102**

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS06	FS07	FS08	----	----
				Sampling date / time	25-Aug-2023 00:00	25-Aug-2023 00:00	25-Aug-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2315510-006	EM2315510-007	EM2315510-008	--------	--------
					Result	Result	Result	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	0.1	%		**8.9**	**15.2**	**16.9**	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	**0.0003**	<0.0002	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.0015**	**0.0008**	**0.0010**	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	<0.001	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0003**	<0.0002	<0.0002	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	FS06	FS07	FS08	----	----
				Sampling date / time	25-Aug-2023 00:00	25-Aug-2023 00:00	25-Aug-2023 00:00	----	----
Compound	CAS Number	LOR	Unit		EM2315510-006	EM2315510-007	EM2315510-008	--------	--------
					Result	Result	Result	----	----
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.0018**	**0.0011**	**0.0010**	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.0015**	**0.0011**	**0.0010**	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		**0.0018**	**0.0011**	**0.0010**	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**125**	**101**	**126**	----	----
13C8-PFOA	----	0.0002	%		**101**	**95.2**	**96.8**	----	----

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	: **EM2315510**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: Thomas 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	: 12611126	Date Samples Received	: 29-Aug-2023
Order number	: ----	Date Analysis Commenced	: 29-Aug-2023
C-O-C number	: ----	Issue Date	: 31-Aug-2023
Sampler	: EG, JA, LW, NP, TW		
Site	:		
Quote number	: EN/005		
No. of samples received	: 8		
No. of samples analysed	: 8		

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

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Jarwis Nheu	Non-Metals Team Leader	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: 5265545)									
EM2315444-001	Anonymous	EA055: Moisture Content	----	0.1	%	<1.0	<1.0	0.0	No Limit
EM2315510-004	FS04	EA055: Moisture Content	----	0.1	%	26.2	26.1	0.0	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5265743)									
EM2315324-001	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
EM2315510-004	FS04	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	0.0008	0.0009	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	0.0026	0.0028	5.9	0% - 50%
		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: 5265743)									
EM2315324-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5265743) - continued									
EM2315324-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EM2315510-004	FS04	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	0.0008	0.0009	15.5	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: 5265743)									
EM2315324-001	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
EM2315510-004	FS04	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5265743)									
EM2315324-001	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
EM2315510-004	FS04	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: 5265743)									
EM2315324-001	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
EM2315510-004	FS04	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0042	0.0046	9.1	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0034	0.0037	8.5	0% - 50%
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0042	0.0046	9.1	0% - 20%

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

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

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5265743)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	81.7	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	76.0	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	98.9	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	86.5	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	97.2	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	90.5	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5265743)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	83.1	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.2	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.1	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.2	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.0	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	84.9	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.0	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	83.0	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.9	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.1	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5265743)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	104	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	86.3	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	87.5	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	99.0	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	97.3	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	102	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.2	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5265743)								

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5265743) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	105	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	87.6	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	93.0	70.0	130
EP231P: PFAS Sums (QCLot: 5265743)								
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.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2315510**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: Thomas Duncan	Telephone	: +6138549 9645
Project	: 12611126	Date Samples Received	: 29-Aug-2023
Site	:	Issue Date	: 31-Aug-2023
Sampler	: EG, JA, LW, NP, TW	No. of samples received	: 8
Order number	: ----	No. of samples analysed	: 8

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Outliers : Frequency of Quality Control Samples

Matrix: **SOIL**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
Method	QC	Regular	Actual	Expected	
	0				
Matrix Spikes (MS)					
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	0	15	0.00	5.00	NEPM 2013 B3 & ALS QC Standard

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method / *Container* / Client Sample ID(s)	*Sample Date*	*Extraction / Preparation*			*Analysis*		
		Date extracted	*Due for extraction*	*Evaluation*	*Date analysed*	*Due for analysis*	*Evaluation*
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055) FS01	**23-Aug-2023**	**----**	----	**----**	**29-Aug-2023**	06-Sep-2023	✓
HDPE Soil Jar (EA055) FS02, FS03, FS04, FS05	**24-Aug-2023**	**----**	----	**----**	**29-Aug-2023**	07-Sep-2023	✓
HDPE Soil Jar (EA055) FS06, FS07, FS08	**25-Aug-2023**	**----**	----	**----**	**29-Aug-2023**	08-Sep-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) FS01	**23-Aug-2023**	**30-Aug-2023**	19-Feb-2024	✓	**31-Aug-2023**	09-Oct-2023	✓
HDPE Soil Jar (EP231X) FS02, FS03, FS04, FS05	**24-Aug-2023**	**30-Aug-2023**	20-Feb-2024	✓	**31-Aug-2023**	09-Oct-2023	✓
HDPE Soil Jar (EP231X) FS06, FS07, FS08	**25-Aug-2023**	**30-Aug-2023**	21-Feb-2024	✓	**31-Aug-2023**	09-Oct-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
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) FS01	**23-Aug-2023**	**30-Aug-2023**	19-Feb-2024	✓	**31-Aug-2023**	09-Oct-2023	✓
HDPE Soil Jar (EP231X) FS02, FS03, FS04, FS05	**24-Aug-2023**	**30-Aug-2023**	20-Feb-2024	✓	**31-Aug-2023**	09-Oct-2023	✓
HDPE Soil Jar (EP231X) FS06, FS07, FS08	**25-Aug-2023**	**30-Aug-2023**	21-Feb-2024	✓	**31-Aug-2023**	09-Oct-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) FS01	**23-Aug-2023**	**30-Aug-2023**	19-Feb-2024	✓	**31-Aug-2023**	09-Oct-2023	✓
HDPE Soil Jar (EP231X) FS02, FS03, FS04, FS05	**24-Aug-2023**	**30-Aug-2023**	20-Feb-2024	✓	**31-Aug-2023**	09-Oct-2023	✓
HDPE Soil Jar (EP231X) FS06, FS07, FS08	**25-Aug-2023**	**30-Aug-2023**	21-Feb-2024	✓	**31-Aug-2023**	09-Oct-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) FS01	**23-Aug-2023**	**30-Aug-2023**	19-Feb-2024	✓	**31-Aug-2023**	09-Oct-2023	✓
HDPE Soil Jar (EP231X) FS02, FS03, FS04, FS05	**24-Aug-2023**	**30-Aug-2023**	20-Feb-2024	✓	**31-Aug-2023**	09-Oct-2023	✓
HDPE Soil Jar (EP231X) FS06, FS07, FS08	**25-Aug-2023**	**30-Aug-2023**	21-Feb-2024	✓	**31-Aug-2023**	09-Oct-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) FS01	**23-Aug-2023**	**30-Aug-2023**	19-Feb-2024	✓	**31-Aug-2023**	09-Oct-2023	✓
HDPE Soil Jar (EP231X) FS02, FS03, FS04, FS05	**24-Aug-2023**	**30-Aug-2023**	20-Feb-2024	✓	**31-Aug-2023**	09-Oct-2023	✓
HDPE Soil Jar (EP231X) FS06, FS07, FS08	**25-Aug-2023**	**30-Aug-2023**	21-Feb-2024	✓	**31-Aug-2023**	09-Oct-2023	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **SOIL**

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

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	0	15	**0.00**	**5.00**	×	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

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

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	: **EM2316158**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Shirley LeCornu
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9630
Project	: 12611126	Date Samples Received	: 08-Sep-2023 11:30
Order number	: ----	Date Analysis Commenced	: 11-Sep-2023
C-O-C number	: ----	Issue Date	: 12-Sep-2023 13:43
Sampler	: EG, NP, TW		
Site	: ----		
Quote number	: ME/875/20 B - SECONDARY WORK ONLY		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Jarwis Nheu	Non-Metals Team Leader	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 EM2315814-017 due to sample matrix interference.
- 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	QC01B	QC02B	QC03B	QC04B	QC05B
			Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	05-Sep-2023 00:00	05-Sep-2023 00:00	05-Sep-2023 00:00
Compound	CAS Number	LOR	Unit	EM2316158-001	EM2316158-002	EM2316158-003	EM2316158-004	EM2316158-005
				Result	Result	Result	Result	Result
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**21.6**	**18.9**	**22.6**	**22.9**	**24.1**
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0016**
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0012**
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	**0.0021**
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QC01B	QC02B	QC03B	QC04B	QC05B
				Sampling date / time	04-Sep-2023 00:00	04-Sep-2023 00:00	05-Sep-2023 00:00	05-Sep-2023 00:00	05-Sep-2023 00:00
Compound	CAS Number	LOR	Unit		EM2316158-001	EM2316158-002	EM2316158-003	EM2316158-004	EM2316158-005
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0049**
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0021**
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	**0.0037**
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**98.3**	**112**	**106**	**114**	**103**
13C8-PFOA	----	0.0002	%		**100**	**102**	**105**	**105**	**102**

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	: **EM2316158**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Contact	: Shirley LeCornu
Address	: Level 4, 211 VICTORIA SQUARE ADELAIDE SA, AUSTRALIA 5000	Address	: 4 Westall Rd Springvale VIC Australia 3171
Telephone	: ----	Telephone	: +6138549 9630
Project	: 12611126	Date Samples Received	: 08-Sep-2023
Order number	: ----	Date Analysis Commenced	: 11-Sep-2023
C-O-C number	: ----	Issue Date	: 12-Sep-2023
Sampler	: EG, NP, TW		
Site	: ----		
Quote number	: ME/875/20 B - SECONDARY WORK ONLY		
No. of samples received	: 5		
No. of samples analysed	: 5		

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

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

This 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*
Jarwis Nheu	Non-Metals Team Leader	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: 5288367)									
EM2315993-001	Anonymous	EA055: Moisture Content	----	0.1	%	30.8	31.6	2.4	0% - 20%
EM2316199-009	Anonymous	EA055: Moisture Content	----	0.1	%	7.5	7.7	2.1	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5288082)									
EM2315814-001	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
EM2316163-002	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	0.0007	0.0008	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: 5288082)									
EM2315814-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 5288082) - continued									
EM2315814-001	Anonymous	EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EM2316163-002	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: 5288082)									
EM2315814-001	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
EM2316163-002	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5288082)									
EM2315814-001	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
EM2316163-002	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: 5288082)									
EM2315814-001	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
EM2316163-002	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0007	0.0008	13.3	No Limit
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0007	0.0008	13.3	No Limit
		EP231X: Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0007	0.0008	13.3	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: 5288082)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00111 mg/kg	88.2	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00118 mg/kg	99.9	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00114 mg/kg	96.4	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00119 mg/kg	109	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00116 mg/kg	90.5	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00121 mg/kg	97.2	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5288082)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	93.2	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	96.1	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	90.3	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.7	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.2	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.5	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.8	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.1	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5288082)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.1	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	105	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	70.0	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	102	70.0	130
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	105	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5288082)								

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: 5288082) - continued								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00117 mg/kg	108	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00119 mg/kg	100	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	98.1	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	103	70.0	130
EP231P: PFAS Sums (QCLot: 5288082)								
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: 5288082)							
EM2315814-017	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00111 mg/kg	93.0	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00118 mg/kg	105	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00114 mg/kg	96.2	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00119 mg/kg	111	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00116 mg/kg	88.0	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00121 mg/kg	66.1	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5288082)							
EM2315814-017	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	94.0	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	97.3	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	88.3	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	96.2	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	102	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	100	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	98.3	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	103	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	97.1	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	138	66.0	139
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	99.4	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5288082)							

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: 5288082) - continued							
EM2315814-017	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	99.1	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	104	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	101	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	119	70.0	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	99.6	70.0	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	105	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	85.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5288082)							
EM2315814-017	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00117 mg/kg	108	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00119 mg/kg	107	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0012 mg/kg	101	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00121 mg/kg	# 43.5	70.0	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EM2316158**	Page	: 1 of 5
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Melbourne
Contact	: TOM DUNCAN	Telephone	: +6138549 9630
Project	: 12611126	Date Samples Received	: 08-Sep-2023
Site	: ----	Issue Date	: 12-Sep-2023
Sampler	: EG, NP, TW	No. of samples received	: 5
Order number	: ----	No. of samples analysed	: 5

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **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
Matrix Spike (MS) Recoveries							
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EM2315814--017	Anonymous	**10:2 Fluorotelomer sulfonic acid (10:2 FTS)**	120226-60-0	43.5 %	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) QC01B, QC02B	**04-Sep-2023**	**----**	----	**----**	**11-Sep-2023**	18-Sep-2023	✓
HDPE Soil Jar (EA055) QC03B, QC04B, QC05B	**05-Sep-2023**	**----**	----	**----**	**11-Sep-2023**	19-Sep-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X) QC01B, QC02B	**04-Sep-2023**	**11-Sep-2023**	02-Mar-2024	✓	**12-Sep-2023**	21-Oct-2023	✓
HDPE Soil Jar (EP231X) QC03B, QC04B, QC05B	**05-Sep-2023**	**11-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	21-Oct-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X) QC01B, QC02B	**04-Sep-2023**	**11-Sep-2023**	02-Mar-2024	✓	**12-Sep-2023**	21-Oct-2023	✓
HDPE Soil Jar (EP231X) QC03B, QC04B, QC05B	**05-Sep-2023**	**11-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	21-Oct-2023	✓
EP231C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X) QC01B, QC02B	**04-Sep-2023**	**11-Sep-2023**	02-Mar-2024	✓	**12-Sep-2023**	21-Oct-2023	✓
HDPE Soil Jar (EP231X) QC03B, QC04B, QC05B	**05-Sep-2023**	**11-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	21-Oct-2023	✓

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X) QC01B, QC02B	**04-Sep-2023**	**11-Sep-2023**	02-Mar-2024	✓	**12-Sep-2023**	21-Oct-2023	✓
HDPE Soil Jar (EP231X) QC03B, QC04B, QC05B	**05-Sep-2023**	**11-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	21-Oct-2023	✓
EP231P: PFAS Sums							
HDPE Soil Jar (EP231X) QC01B, QC02B	**04-Sep-2023**	**11-Sep-2023**	02-Mar-2024	✓	**12-Sep-2023**	21-Oct-2023	✓
HDPE Soil Jar (EP231X) QC03B, QC04B, QC05B	**05-Sep-2023**	**11-Sep-2023**	03-Mar-2024	✓	**12-Sep-2023**	21-Oct-2023	✓

Quality Control Parameter Frequency Compliance

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

Matrix: **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	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	*Method*	*Matrix*	*Method Descriptions*
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.

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CERTIFICATE OF ANALYSIS 329017

Client Details

Client	GHD Pty Ltd
Attention	Terrence Wilson
Address	GPO Box 2052, Adelaide, SA, 5001

Sample Details

Your Reference	**12611126**
Number of Samples	6 Swab
Date samples received	27/07/2023
Date completed instructions received	27/07/2023

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	03/08/2023
Date of Issue	03/08/2023

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Results Approved By
Alexander Mitchell Maclean, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

PFAS in Swab/Filter Extended*				
Our Reference		329017-1	329017-4	329017-6
Your Reference	UNITS	DS01	DS04	DS06
Date Sampled		25/07/2023	25/07/2023	25/07/2023
Type of sample		Swab	Swab	Swab
Date prepared	-	31/07/2023	31/07/2023	31/07/2023
Date analysed	-	31/07/2023	31/07/2023	31/07/2023
Perfluorobutanesulfonic acid	µg/sample	<0.001	<0.001	<0.001
Perfluoropentanesulfonic acid	µg/sample	<0.001	<0.001	<0.001
Perfluorohexanesulfonic acid - PFHxS	µg/sample	<0.001	0.004	<0.001
Perfluoroheptanesulfonic acid	µg/sample	<0.001	<0.001	<0.001
Perfluorooctanesulfonic acid PFOS	µg/sample	<0.001	0.026	0.0023
Perfluorodecanesulfonic acid	µg/sample	<0.002	<0.002	<0.002
Perfluorobutanoic acid	µg/sample	<0.002	<0.002	<0.002
Perfluoropentanoic acid	µg/sample	<0.002	<0.002	<0.002
Perfluorohexanoic acid	µg/sample	<0.001	<0.001	<0.001
Perfluoroheptanoic acid	µg/sample	<0.001	<0.001	<0.001
Perfluorooctanoic acid PFOA	µg/sample	<0.001	<0.001	<0.001
Perfluorononanoic acid	µg/sample	<0.001	<0.001	<0.001
Perfluorodecanoic acid	µg/sample	<0.005	<0.005	<0.005
Perfluoroundecanoic acid	µg/sample	<0.005	<0.005	<0.005
Perfluorododecanoic acid	µg/sample	<0.005	<0.005	<0.005
Perfluorotridecanoic acid	µg/sample	<0.005	<0.005	<0.005
Perfluorotetradecanoic acid	µg/sample	<0.05	<0.05	<0.05
4:2 FTS	µg/sample	<0.001	<0.001	<0.001
6:2 FTS	µg/sample	<0.001	<0.001	<0.001
8:2 FTS	µg/sample	<0.002	<0.002	<0.002
10:2 FTS	µg/sample	<0.002	<0.002	<0.002
Perfluorooctane sulfonamide	µg/sample	<0.01	<0.01	<0.01
N-Methyl perfluorooctane sulfonamide	µg/sample	<0.01	<0.01	<0.01
N-Ethyl perfluorooctanesulfon amide	µg/sample	<0.01	<0.01	<0.01
N-Me perfluorooctanesulfonamid oethanol	µg/sample	<0.01	<0.01	<0.01
N-Et perfluorooctanesulfonamid oethanol	µg/sample	<0.05	<0.05	<0.05
MePerfluorooctanesulf- amid oacetic acid	µg/sample	<0.002	<0.002	<0.002
EtPerfluorooctanesulf amid oacetic acid	µg/sample	<0.002	<0.002	<0.002
Surrogate $^{13}C_8$ *PFOS*	%	102	98	97
Surrogate $^{13}C_2$ *PFOA*	%	98	86	79
Total Positive PFAS	µg/sample	<0.001	0.030	0.002

Method ID	Methodology Summary
Org-029	Soil/miscellaneous media (swabs/wipes/filters for example) samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/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 Swab/Filter Extended*					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			31/07/2023	[NT]	[NT]	[NT]	[NT]	31/07/2023	[NT]
Date analysed	-			31/07/2023	[NT]	[NT]	[NT]	[NT]	31/07/2023	[NT]
Perfluorobutanesulfonic acid	µg/sample	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	123	[NT]
Perfluoropentanesulfonic acid	µg/sample	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	113	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/sample	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	118	[NT]
Perfluoroheptanesulfonic acid	µg/sample	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluorooctanesulfonic acid PFOS	µg/sample	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	110	[NT]
Perfluorodecanesulfonic acid	µg/sample	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluorobutanoic acid	µg/sample	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	119	[NT]
Perfluoropentanoic acid	µg/sample	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	134	[NT]
Perfluorohexanoic acid	µg/sample	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	106	[NT]
Perfluoroheptanoic acid	µg/sample	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	107	[NT]
Perfluorooctanoic acid PFOA	µg/sample	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	111	[NT]
Perfluorononanoic acid	µg/sample	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	100	[NT]
Perfluorodecanoic acid	µg/sample	0.005	Org-029	<0.005	[NT]	[NT]	[NT]	[NT]	122	[NT]
Perfluoroundecanoic acid	µg/sample	0.005	Org-029	<0.005	[NT]	[NT]	[NT]	[NT]	124	[NT]
Perfluorododecanoic acid	µg/sample	0.005	Org-029	<0.005	[NT]	[NT]	[NT]	[NT]	120	[NT]
Perfluorotridecanoic acid	µg/sample	0.005	Org-029	<0.005	[NT]	[NT]	[NT]	[NT]	111	[NT]
Perfluorotetradecanoic acid	µg/sample	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	131	[NT]
4:2 FTS	µg/sample	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	109	[NT]
6:2 FTS	µg/sample	0.001	Org-029	<0.001	[NT]	[NT]	[NT]	[NT]	111	[NT]
8:2 FTS	µg/sample	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	119	[NT]
10:2 FTS	µg/sample	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	110	[NT]
Perfluorooctane sulfonamide	µg/sample	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	137	[NT]
N-Methyl perfluorooctane sulfonamide	µg/sample	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	122	[NT]
N-Ethyl perfluorooctanesulfon amide	µg/sample	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	102	[NT]
N-Me perfluorooctanesulfonamid oethanol	µg/sample	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	124	[NT]
N-Et perfluorooctanesulfonamid oethanol	µg/sample	0.05	Org-029	<0.05	[NT]	[NT]	[NT]	[NT]	139	[NT]
MePerfluorooctanesulf- amid oacetic acid	µg/sample	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	112	[NT]
EtPerfluorooctanesulf amid oacetic acid	µg/sample	0.002	Org-029	<0.002	[NT]	[NT]	[NT]	[NT]	102	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	111	[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.

Appendix G

Tabulated Analytical Results

Table 1
Analytical Soil Results

SA MFS
MFS Oakden DSI

						PFAS - Perfluoroalkyl Sulfonic Acids					PFAS - Perfluoroalkyl Sulfonic Acids		PFAS - Perfluoroalkyl Carboxylic Acids			PFAS - Perfluoroalkyl Carboxylic 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)
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
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	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure											1						10				
PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed sites											0.14										
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)									20		20						50				
PFAS NEMP 2.0 2020 Public open space (HIL C)									1		1						10				
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)									2		2						20				
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)									0.01		0.01						0.1				
SA MFS Site Specific Criteria - Metropolitan (Staffed)																	50				
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth (metres)**																	
S1	26 Sep 2018	S1	ES1828831	0 - 0.2	-	0.0025	0.0039	0.135	0.0300	3.79	0.0110	0.009	0.0153	0.115	0.0098	0.0521	0.0021	0.0006	0.0003	0.0008
S2	26 Sep 2018	S2	ES1828831	0 - 0.3	-	<0.0002	<0.0002	0.0020	<0.0002	0.0575	0.0024	0.006	0.0136	0.0140	0.0052	0.0064	0.0028	0.0017	0.0008	0.0004
S3	26 Sep 2018	S3	ES1828831	0 - 0.2	-	0.0004	0.0004	0.0045	0.0006	0.0657	0.0030	0.006	0.0053	0.0077	0.0032	0.0028	0.0030	0.0009	0.0016	0.0002
TP121	16 Mar 2022	TP121_0.5-0.8	EM2204661	0.5 - 0.8	-	<0.0002	-	0.0003	-	<0.0002	-	<0.001	<0.0002	0.0005	<0.0002	<0.0002	-	-	-	-
TP122	16 Mar 2022	TP122_0.0-0.2	EM2204661	0 - 0.2	-	<0.0002	-	<0.0002	-	0.0366	-	<0.001	<0.0002	<0.0002	<0.0002	0.0002	-	-	-	-
		TP122_0.5-0.7	EM2204661	0.5 - 0.7	-	<0.0002	-	0.0007	-	0.013	-	<0.001	<0.0002	0.0004	<0.0002	<0.0002	-	-	-	-
TP201	15 May 2023	TP201_0.0-0.2	EM2308637	0 - 0.2	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0012	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
TP202	15 May 2023	TP202_0.0-0.1	EM2308637	0 - 0.1	-	<0.0002	<0.0002	0.0008	<0.0002	0.0041	<0.0002	<0.001	0.0010	0.0006	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
TP203	15 May 2023	TP203_0.0-0.2	EM2308637	0 - 0.2	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0014	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
TP204	15 May 2023	TP204_0.0-0.2	EM2308637	0 - 0.2	-	<0.0002	<0.0002	0.0002	<0.0002	0.0193	<0.0002	<0.001	0.0015	0.0004	0.0002	0.0005	0.0005	<0.0002	<0.0002	<0.0002
		TP204_0.3-0.5	EM2310314	0.3 - 0.5	-	0.0006	0.0004	0.0033	<0.0002	0.0035	<0.0002	<0.001	0.0027	0.0032	0.0003	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
TP205	15 May 2023	TP205_0.0-0.2	EM2308637	0 - 0.2	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0038	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
TP206	15 May 2023	TP206_0.0-0.2	EM2308637	0 - 0.2	-	<0.0002	<0.0002	0.0010	<0.0002	0.112	0.0020	<0.001	0.0002	0.0004	<0.0002	0.0006	<0.0002	<0.0002	<0.0002	<0.0002
		TP206_0.5-0.7	EM2310314	0.5 - 0.7	-	<0.0002	<0.0002	0.0070	0.0028	0.126	<0.0002	<0.001	0.0004	0.0006	0.0002	0.0021	<0.0002	<0.0002	<0.0002	<0.0002
		TP206_0.8-1.0	EM2310619	0.8 - 1	-	0.0013	0.0010	0.0196	0.0028	0.0406	<0.0002	<0.001	0.0007	0.0016	0.0002	0.0018	<0.0002	<0.0002	<0.0002	<0.0002
TP207	15 May 2023	TP207_0.0-0.2	EM2308637	0 - 0.2	-	<0.0002	<0.0002	0.0014	<0.0002	0.102	0.0013	<0.001	0.0011	0.0006	0.0005	0.0012	0.0021	0.0007	0.0009	0.0003
		TP207_0.3-0.5	EM2310314	0.3 - 0.5	-	<0.0002	<0.0002	0.0011	0.0004	0.122	0.0004	<0.001	0.0007	0.0002	0.0004	0.0006	0.0003	<0.0002	<0.0002	<0.0002
		TP207_0.8-1.0	EM2310619	0.8 - 1	-	<0.0002	<0.0002	0.0040	0.0015	0.0356	<0.0002	<0.001	0.0003	<0.0002	0.0004	0.0013	<0.0002	<0.0002	<0.0002	<0.0002
TP208	16 May 2023	TP208_0.0-0.2	EM2308849	0 - 0.2	-	<0.0002	<0.0002	0.0002	<0.0002	0.0060	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
TP209	16 May 2023	TP209_0.0-0.2	EM2308849	0 - 0.2	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0051	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
TP210	15 May 2023	TP210_0.0-0.1	EM2310314	0 - 0.1	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0027	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
TP212	15 May 2023	TP212_0.0-0.1	EM2310314	0 - 0.1	-	<0.0002	<0.0002	0.0003	<0.0002	0.0081	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
TP214	15 May 2023	TP214_0.0-0.1	EM2310314	0 - 0.1	-	<0.0002	<0.0002	<0.0002	<0.0002	0.0033	<0.0002	<0.001	<0.0002	<0.0002	<0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002
BH01	18 Jul 2023	BH01_0.0-0.1	1009731	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.0054	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH01_0.85-0.95	1013609	0.85 - 0.95	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH01_1.4-1.5	1009731	1.4 - 1.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH01_2.25-2.35	1013609	2.25 - 2.35	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH02	19 Jul 2023	BH02_0-0.1	1009731	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.11	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH02_1.4-1.5	1013609	1.4 - 1.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH02_2.7-2.8	1009731	2.7 - 2.8	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH03	19 Jul 2023	BH03_0.5-0.6	1009731	0.5 - 0.6	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH03_1.5-1.7	1009731	1.5 - 1.7	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH03_3.2-3.3	1013609	3.2 - 3.3	<0.005	<0.005	<0.005	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH03_4.9-5.0	1013609	4.9 - 5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH04	18 Jul 2023	BH04_0.5-0.65	1009731	0.5 - 0.65	<0.005	0.0064	0.0076	0.13	0.022	1.2	<0.005	<0.005	0.0093	0.021	0.0080	0.016	<0.005	<0.005	<0.005	<0.005
		BH04_2.5-2.6	1009731	2.5 - 2.6	<0.005	<0.005	<0.005	0.016	<0.005	0.0078	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH04_2.9-3.0	1013609	2.9 - 3	<0.005	<0.005	<0.005	0.0095	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH05	19 Jul 2023	BH05_0.08-0.18	1009731	0.08 - 0.18	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH05_3.0-3.15	1009731	3 - 3.15	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH06	18 Jul 2023	BH06_0.4-0.5	1009731	0.4 - 0.5	<0.005	<0.005	0.0073	0.096	<0.005	0.019	<0.005	<0.005	<0.005	0.0083	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH06_2.9-3.0	1009731	2.9 - 3	<0.005	<0.005	<0.005	0.0072	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH06_4.4-4.5	1013609	4.4 - 4.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH07	18 Jul 2023	BH07_0.08-0.2	1009731	0.08 - 0.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH07_2.8-2.9	1009731	2.8 - 2.9	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH08	18 Jul 2023	BH08_0-0.1	1009731	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.066	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH08_1.9-2.0	1009731	1.9 - 2	<0.005	<0.005	<0.005	0.014	<0.005	0.018	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH08_2.9-3.0	1013609	2.9 - 3	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH08_4.9-5.0	1013609	4.9 - 5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH09	23 Aug 2023	BH09_0.9-1.0	1020822	0.9 - 1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH10	23 Aug 2023	BH10_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH11	23 Aug 2023	BH11_0.9-1.0	1020822	0.9 - 1	<0.005	<0.005	<0.005	<0.005	<0.005	0.0061	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH12	24 Aug 2023	BH12_0.6-0.7	1020822	0.6 - 0.7	<0.005	0.0086	<0.005	0.037	<0.005	0.014	<0.005	<0.005	<0.005	0.0055	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH13	24 Aug 2023	BH13_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH14	23 Aug 2023	BH14_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH15	23 Aug 2023	BH15_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH16	23 Aug 2023	BH16_0.1-0.2	1020822	0.1 - 0.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH16_0.4-0.6	1020822	0.4 - 0.6	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH17	23 Aug 2023	BH17_0.25-0.42	1020822	0.25 - 0.42	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH18	23 Aug 2023	BH18_0.9-1.0	1020822	0.9 - 1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH19	24 Aug 2023	BH19_0.01-0.1	1020822	0.01 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH19_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH20	24 Aug 2023	BH20_0.01-0.1	1020822	0.01 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH20_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Table 1
Analytical Soil Results

					PFAS - Perfluoroalkyl Carboxylic Acids		PFAS - Perfluoroalkyl Sulfonamide		PFAS - Perfluoroalkyl Sulfonamide				PFAS - Perfluoroalkyl Sulfonamide	PFAS - Fluorotelomer Sulfonic Acids			PFAS - Fluorotelomer Sulfonic Acids
					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
EQL					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 Industrial/ commercial (HIL D)																	
PFAS NEMP 2.0 2020 Public open space (HIL C)																	
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)																	
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)																	
SA MFS Site Specific Criteria - Metropolitan (Staffed)																	
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth (metres)**													
S1	26 Sep 2018	S1	ES1828831	0 - 0.2	<0.0002	<0.0005	0.0110	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005
S2	26 Sep 2018	S2	ES1828831	0 - 0.3	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	0.0083	0.0060	<0.0005
S3	26 Sep 2018	S3	ES1828831	0 - 0.2	<0.0002	<0.0005	<0.0002	<0.0005	<0.0005	<0.0002	<0.0005	<0.0005	0.0003	<0.0005	0.0013	0.0030	0.0005
TP121	16 Mar 2022	TP121_0.5-0.8	EM2204661	0.5 - 0.8	-	-	-	-	-	-	-	-	-	<0.0005	<0.0005	<0.0005	<0.0005
TP122	16 Mar 2022	TP122_0.0-0.2	EM2204661	0 - 0.2	-	-	-	-	-	-	-	-	-	<0.0005	<0.0005	<0.0005	<0.0005
		TP122_0.5-0.7	EM2204661	0.5 - 0.7	-	-	-	-	-	-	-	-	-	<0.0005	<0.0005	<0.0005	<0.0005
TP201	15 May 2023	TP201_0.0-0.2	EM2308637	0 - 0.2	<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
TP202	15 May 2023	TP202_0.0-0.1	EM2308637	0 - 0.1	<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
TP203	15 May 2023	TP203_0.0-0.2	EM2308637	0 - 0.2	<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
TP204	15 May 2023	TP204_0.0-0.2	EM2308637	0 - 0.2	<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
		TP204_0.3-0.5	EM2310314	0.3 - 0.5	<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
TP205	15 May 2023	TP205_0.0-0.2	EM2308637	0 - 0.2	<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
TP206	15 May 2023	TP206_0.0-0.2	EM2308637	0 - 0.2	<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
		TP206_0.5-0.7	EM2310314	0.5 - 0.7	<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
		TP206_0.8-1.0	EM2310619	0.8 - 1	<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
TP207	15 May 2023	TP207_0.0-0.2	EM2308637	0 - 0.2	<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
		TP207_0.3-0.5	EM2310314	0.3 - 0.5	<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
		TP207_0.8-1.0	EM2310619	0.8 - 1	<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
TP208	16 May 2023	TP208_0.0-0.2	EM2308849	0 - 0.2	<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
TP209	16 May 2023	TP209_0.0-0.2	EM2308849	0 - 0.2	<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
TP210	15 May 2023	TP210_0.0-0.1	EM2310314	0 - 0.1	<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
TP212	15 May 2023	TP212_0.0-0.1	EM2310314	0 - 0.1	<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
TP214	15 May 2023	TP214_0.0-0.1	EM2310314	0 - 0.1	<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
BH01	18 Jul 2023	BH01_0.0-0.1	1009731	0 - 0.1	<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_0.85-0.95	1013609	0.85 - 0.95	<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_1.4-1.5	1009731	1.4 - 1.5	<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_2.25-2.35	1013609	2.25 - 2.35	<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
BH02	19 Jul 2023	BH02_0-0.1	1009731	0 - 0.1	<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
		BH02_1.4-1.5	1013609	1.4 - 1.5	<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
		BH02_2.7-2.8	1009731	2.7 - 2.8	<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	19 Jul 2023	BH03_0.5-0.6	1009731	0.5 - 0.6	<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_1.5-1.7	1009731	1.5 - 1.7	<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_3.2-3.3	1013609	3.2 - 3.3	<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_4.9-5.0	1013609	4.9 - 5	<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	18 Jul 2023	BH04_0.5-0.65	1009731	0.5 - 0.65	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	0.074	<0.005	<0.005
		BH04_2.5-2.6	1009731	2.5 - 2.6	<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_2.9-3.0	1013609	2.9 - 3	<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	19 Jul 2023	BH05_0.08-0.18	1009731	0.08 - 0.18	<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_3.0-3.15	1009731	3 - 3.15	<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	18 Jul 2023	BH06_0.4-0.5	1009731	0.4 - 0.5	<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_2.9-3.0	1009731	2.9 - 3	<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_4.4-4.5	1013609	4.4 - 4.5	<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
BH07	18 Jul 2023	BH07_0.08-0.2	1009731	0.08 - 0.2	<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
		BH07_2.8-2.9	1009731	2.8 - 2.9	<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
BH08	18 Jul 2023	BH08_0-0.1	1009731	0 - 0.1	<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
		BH08_1.9-2.0	1009731	1.9 - 2	<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
		BH08_2.9-3.0	1013609	2.9 - 3	<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
		BH08_4.9-5.0	1013609	4.9 - 5	<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
BH09	23 Aug 2023	BH09_0.9-1.0	1020822	0.9 - 1	<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
BH10	23 Aug 2023	BH10_0.4-0.5	1020822	0.4 - 0.5	<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
BH11	23 Aug 2023	BH11_0.9-1.0	1020822	0.9 - 1	<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
BH12	24 Aug 2023	BH12_0.6-0.7	1020822	0.6 - 0.7	<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
BH13	24 Aug 2023	BH13_0.4-0.5	1020822	0.4 - 0.5	<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
BH14	23 Aug 2023	BH14_0.4-0.5	1020822	0.4 - 0.5	<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
BH15	23 Aug 2023	BH15_0.4-0.5	1020822	0.4 - 0.5	<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
BH16	23 Aug 2023	BH16_0.1-0.2	1020822	0.1 - 0.2	<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
		BH16_0.4-0.6	1020822	0.4 - 0.6	<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
BH17	23 Aug 2023	BH17_0.25-0.42	1020822	0.25 - 0.42	<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
BH18	23 Aug 2023	BH18_0.9-1.0	1020822	0.9 - 1	<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
BH19	24 Aug 2023	BH19_0.01-0.1	1020822	0.01 - 0.1	<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
		BH19_0.4-0.5	1020822	0.4 - 0.5	<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
BH20	24 Aug 2023	BH20_0.01-0.1	1020822	0.01 - 0.1	<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
		BH20_0.4-0.5	1020822	0.4 - 0.5	<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

Table 1
Analytical Soil Results

					PFAS - Sums					PFAS - Other
					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 Industrial/ commercial (HIL D)					20					
PFAS NEMP 2.0 2020 Public open space (HIL C)					1					
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)					2					
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)					0.01					
SA MFS Site Specific Criteria - Metropolitan (Staffed)					14					
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth (metres)**						
S1	26 Sep 2018	S1	ES1828831	0 - 0.2	3.92	-	4.17	-	3.60	-
S2	26 Sep 2018	S2	ES1828831	0 - 0.3	0.0593	-	0.112	-	0.0900	-
S3	26 Sep 2018	S3	ES1828831	0 - 0.2	0.07	-	0.107	-	0.0849	-
TP121	16 Mar 2022	TP121_0.5-0.8	EM2204661	0.5 - 0.8	0.0003	-	-	-	-	-
TP122	16 Mar 2022	TP122_0.0-0.2	EM2204661	0 - 0.2	0.0366	-	-	-	-	-
		TP122_0.5-0.7	EM2204661	0.5 - 0.7	0.0137	-	-	-	-	-
TP201	15 May 2023	TP201_0.0-0.2	EM2308637	0 - 0.2	0.0012	-	0.0012	-	0.0012	-
TP202	15 May 2023	TP202_0.0-0.1	EM2308637	0 - 0.1	0.0049	-	0.0068	-	0.0068	-
TP203	15 May 2023	TP203_0.0-0.2	EM2308637	0 - 0.2	0.0014	-	0.0014	-	0.0014	-
TP204	15 May 2023	TP204_0.0-0.2	EM2308637	0 - 0.2	0.0195	-	0.0226	-	0.0221	-
		TP204_0.3-0.5	EM2310314	0.3 - 0.5	0.0068	-	0.0140	-	0.0136	-
TP205	15 May 2023	TP205_0.0-0.2	EM2308637	0 - 0.2	0.0038	-	0.0038	-	0.0038	-
TP206	15 May 2023	TP206_0.0-0.2	EM2308637	0 - 0.2	0.113	-	0.116	-	0.114	-
		TP206_0.5-0.7	EM2310314	0.5 - 0.7	0.133	-	0.139	-	0.136	-
		TP206_0.8-1.0	EM2310619	0.8 - 1	0.0602	-	0.0696	-	0.0658	-
TP207	15 May 2023	TP207_0.0-0.2	EM2308637	0 - 0.2	0.103	-	0.112	-	0.107	-
		TP207_0.3-0.5	EM2310314	0.3 - 0.5	0.123	-	0.126	-	0.125	-
		TP207_0.8-1.0	EM2310619	0.8 - 1	0.0396	-	0.0431	-	0.0416	-
TP208	16 May 2023	TP208_0.0-0.2	EM2308849	0 - 0.2	0.0062	-	0.0062	-	0.0062	-
TP209	16 May 2023	TP209_0.0-0.2	EM2308849	0 - 0.2	0.0051	-	0.0051	-	0.0051	-
TP210	15 May 2023	TP210_0.0-0.1	EM2310314	0 - 0.1	0.0027	-	0.0027	-	0.0027	-
TP212	15 May 2023	TP212_0.0-0.1	EM2310314	0 - 0.1	0.0084	-	0.0084	-	0.0084	-
TP214	15 May 2023	TP214_0.0-0.1	EM2310314	0 - 0.1	0.0033	-	0.0037	-	0.0037	-
BH01	18 Jul 2023	BH01_0-0.1	1009731	0 - 0.1	0.0054	0.0054	<0.05	0.0054	<0.01	<0.005
		BH01_0.85-0.95	1013609	0.85 - 0.95	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH01_1.4-1.5	1009731	1.4 - 1.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH01_2.25-2.35	1013609	2.25 - 2.35	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH02	19 Jul 2023	BH02_0-0.1	1009731	0 - 0.1	0.11	0.11	0.11	0.11	0.11	<0.005
		BH02_1.4-1.5	1013609	1.4 - 1.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH02_2.7-2.8	1009731	2.7 - 2.8	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH03	19 Jul 2023	BH03_0.5-0.6	1009731	0.5 - 0.6	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH03_1.5-1.7	1009731	1.5 - 1.7	0.01	0.01	<0.05	0.01	0.01	<0.005
		BH03_3.2-3.3	1013609	3.2 - 3.3	0.014	<0.005	<0.05	0.014	0.014	<0.005
		BH03_4.9-5.0	1013609	4.9 - 5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH04	18 Jul 2023	BH04_0.5-0.65	1009731	0.5 - 0.65	1.33	1.216	1.5009	1.346	1.4647	0.0066
		BH04_2.5-2.6	1009731	2.5 - 2.6	0.0238	0.0078	<0.05	0.0238	0.0238	<0.005
		BH04_2.9-3.0	1013609	2.9 - 3	0.0095	<0.005	<0.05	0.0095	<0.01	<0.005
BH05	19 Jul 2023	BH05_0.08-0.18	1009731	0.08 - 0.18	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH05_3.0-3.15	1009731	3 - 3.15	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH06	18 Jul 2023	BH06_0.4-0.5	1009731	0.4 - 0.5	0.115	0.019	0.1306	0.115	0.1233	<0.005
		BH06_2.9-3.0	1009731	2.9 - 3	0.0072	<0.005	<0.05	0.0072	<0.01	<0.005
		BH06_4.4-4.5	1013609	4.4 - 4.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH07	18 Jul 2023	BH07_0.08-0.2	1009731	0.08 - 0.2	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH07_2.8-2.9	1009731	2.8 - 2.9	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH08	18 Jul 2023	BH08_0-0.1	1009731	0 - 0.1	0.066	0.066	0.066	0.066	0.066	<0.005
		BH08_1.9-2.0	1009731	1.9 - 2	0.032	0.018	<0.05	0.032	0.032	<0.005
		BH08_2.9-3.0	1013609	2.9 - 3	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH08_4.9-5.0	1013609	4.9 - 5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH09	23 Aug 2023	BH09_0.9-1.0	1020822	0.9 - 1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH10	23 Aug 2023	BH10_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH11	23 Aug 2023	BH11_0.9-1.0	1020822	0.9 - 1	0.0061	0.0061	<0.05	0.0061	<0.01	<0.005
BH12	24 Aug 2023	BH12_0.6-0.7	1020822	0.6 - 0.7	0.051	0.014	0.0651	0.051	0.0651	<0.005
BH13	24 Aug 2023	BH13_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH14	23 Aug 2023	BH14_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH15	23 Aug 2023	BH15_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH16	23 Aug 2023	BH16_0.1-0.2	1020822	0.1 - 0.2	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH16_0.4-0.6	1020822	0.4 - 0.6	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH17	23 Aug 2023	BH17_0.25-0.42	1020822	0.25 - 0.42	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH18	23 Aug 2023	BH18_0.9-1.0	1020822	0.9 - 1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH19	24 Aug 2023	BH19_0.01-0.1	1020822	0.01 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH19_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH20	24 Aug 2023	BH20_0.01-0.1	1020822	0.01 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH20_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005

Table 1
Analytical Soil Results

					PFAS - Perfluoroalkyl Sulfonic Acids					PFAS - Perfluoroalkyl Sulfonic Acids		PFAS - Perfluoroalkyl Carboxylic Acids			PFAS - Perfluoroalkyl Carboxylic 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)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
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	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure										1						10				
PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed sites										0.14										
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)								20		20						50				
PFAS NEMP 2.0 2020 Public open space (HIL C)								1		1						10				
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)								2		2						20				
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)								0.01		0.01						0.1				
SA MFS Site Specific Criteria - Metropolitan (Staffed)																50				
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth (metres)**																
BH21	24 Aug 2023	BH21_0.01-0.11	1020822	0.01 - 0.11	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH21_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH22	24 Aug 2023	BH22_0.01-0.11	1020822	0.01 - 0.11	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH22_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH23	24 Aug 2023	BH23_0.01-0.11	1020822	0.01 - 0.11	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH23_0.2-0.32	1020822	0.2 - 0.32	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH24	24 Aug 2023	BH24_0.5-0.6	1020822	0.5 - 0.6	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH25	24 Aug 2023	BH25_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH26	24 Aug 2023	BH26_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	0.22	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH27	24 Aug 2023	BH27_0.01-0.11	1020822	0.01 - 0.11	<0.005	<0.005	<0.005	<0.005	<0.005	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH27_0.4-0.45	1020822	0.4 - 0.45	<0.005	<0.005	<0.005	<0.005	<0.005	0.0057	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH28	24 Aug 2023	BH28_0.01-0.11	1020822	0.01 - 0.11	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH28_0.2-0.3	1020822	0.2 - 0.3	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH29	24 Aug 2023	BH29_0.01-0.06	1020822	0.01 - 0.06	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH29_0.25-0.3	1020822	0.25 - 0.3	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.006	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH30	24 Aug 2023	BH30_0.01-0.11	1020822	0.01 - 0.11	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH30_0.25-0.3	1020822	0.25 - 0.3	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH31	24 Aug 2023	BH31_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH31_0.25-0.35	1020822	0.25 - 0.35	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH32	24 Aug 2023	BH32_0.01-0.11	1020822	0.01 - 0.11	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH32_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH33	25 Aug 2023	BH33_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH34	25 Aug 2023	BH34_0.01-0.05	1020822	0.01 - 0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH34_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH35	25 Aug 2023	BH35_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	0.0076	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH36	25 Aug 2023	BH36_0.01-0.1	1020822	0.01 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.011	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH36_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH37	25 Aug 2023	BH37_0.01-0.1	1020822	0.01 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH37_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH38	25 Aug 2023	BH38_0.0-0.1	1020822	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH38-0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH39	25 Aug 2023	BH39_0.0-0.05	1020822	0 - 0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH39_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH40	25 Aug 2023	BH40_0.0-0.1	1020822	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH40_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH41	25 Aug 2023	BH41_0.01-0.1	1020822	0.01 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH41_0.9-1.0	1020822	0.9 - 1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH42	25 Aug 2023	BH42_0.0-0.1	1020822	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH42_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH43	25 Aug 2023	BH43_0.01-0.1	1020822	0.01 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH43_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH44	25 Aug 2023	BH44_0.0-0.1	1020822	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH44_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH45	25 Aug 2023	BH45_0.0-0.05	1020822	0 - 0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH45_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH46	25 Aug 2023	BH46_0.0-0.1	1020822	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH46_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH47	25 Aug 2023	BH47_0.0-0.1	1020822	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH47_0.45-0.5	1020822	0.45 - 0.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH48	04 Sep 2023	BH48_0.1-0.2	1024020	0.1 - 0.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH49	04 Sep 2023	BH49_0.01-0.1	1024020	0.01 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH50	04 Sep 2023	BH50_0.01-0.1	1024020	0.01 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH50_1.4-1.5	1025806	1.4 - 1.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH50_2.4-2.5	1024020	2.4 - 2.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH51	04 Sep 2023	BH51_0.01-0.1	1024020	0.01 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.0090	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH51_0.9-1.0	1025806	0.9 - 1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH52	04 Sep 2023	BH52_0.01-0.15	1024020	0.01 - 0.15	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH53	04 Sep 2023	BH53_0.01-0.15	1024020	0.01 - 0.15	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH54	04 Sep 2023	BH54_0.0-0.15	1024020	0 - 0.15	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH54_2.4-2.5	1024020	2.4 - 2.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH55	04 Sep 2023	BH55_0.01-0.1	1024020	0.01 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH56	04 Sep 2023	BH56_0.01-0.2	1024020	0.01 - 0.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH57	05 Sep 2023	BH57_0-0.1	1024020	0 - 0.1	<0.005	<0.005	<0.005	0.014	<0.005	0.093	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH57_1.4-1.5	1024020	1.4 - 1.5	<0.005	0.011	0.0081	0.05	<0.005	<0.005	<0.005	<0.005	<0.005	0.0084	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH57_2.9-3.0	1025806	2.9 - 3	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Table 1
Analytical Soil Results

					PFAS - Perfluoroalkyl Carboxylic Acids		PFAS - Perfluoroalkyl Sulfonamide		PFAS - Perfluoroalkyl Sulfonamide				PFAS - Perfluoroalkyl Sulfonamide	PFAS - Fluorotelomer Sulfonic Acids			PFAS - Fluorotelomer Sulfonic Acids
					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
EQL					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 Industrial/ commercial (HIL D)																	
PFAS NEMP 2.0 2020 Public open space (HIL C)																	
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)																	
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)																	
SA MFS Site Specific Criteria - Metropolitan (Staffed)																	
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth (metres)**													
BH21	24 Aug 2023	BH21_0.01-0.11	1020822	0.01 - 0.11	<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
		BH21_0.4-0.5	1020822	0.4 - 0.5	<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
BH22	24 Aug 2023	BH22_0.01-0.11	1020822	0.01 - 0.11	<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
		BH22_0.4-0.5	1020822	0.4 - 0.5	<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
BH23	24 Aug 2023	BH23_0.01-0.11	1020822	0.01 - 0.11	<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
		BH23_0.2-0.32	1020822	0.2 - 0.32	<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
BH24	24 Aug 2023	BH24_0.5-0.6	1020822	0.5 - 0.6	<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
BH25	24 Aug 2023	BH25_0.4-0.5	1020822	0.4 - 0.5	<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
BH26	24 Aug 2023	BH26_0.4-0.5	1020822	0.4 - 0.5	<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
BH27	24 Aug 2023	BH27_0.01-0.11	1020822	0.01 - 0.11	<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
		BH27_0.4-0.45	1020822	0.4 - 0.45	<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
BH28	24 Aug 2023	BH28_0.01-0.11	1020822	0.01 - 0.11	<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
		BH28_0.2-0.3	1020822	0.2 - 0.3	<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
BH29	24 Aug 2023	BH29_0.01-0.06	1020822	0.01 - 0.06	<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
		BH29_0.25-0.3	1020822	0.25 - 0.3	<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
BH30	24 Aug 2023	BH30_0.01-0.11	1020822	0.01 - 0.11	<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
		BH30_0.25-0.3	1020822	0.25 - 0.3	<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
BH31	24 Aug 2023	BH31_0.4-0.5	1020822	0.4 - 0.5	<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
		BH31_0.25-0.35	1020822	0.25 - 0.35	<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
BH32	24 Aug 2023	BH32_0.01-0.11	1020822	0.01 - 0.11	<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
		BH32_0.4-0.5	1020822	0.4 - 0.5	<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
BH33	25 Aug 2023	BH33_0.4-0.5	1020822	0.4 - 0.5	<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
BH34	25 Aug 2023	BH34_0.01-0.05	1020822	0.01 - 0.05	<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
		BH34_0.4-0.5	1020822	0.4 - 0.5	<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
BH35	25 Aug 2023	BH35_0.4-0.5	1020822	0.4 - 0.5	<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
BH36	25 Aug 2023	BH36_0.01-0.1	1020822	0.01 - 0.1	<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
		BH36_0.4-0.5	1020822	0.4 - 0.5	<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
BH37	25 Aug 2023	BH37_0.01-0.1	1020822	0.01 - 0.1	<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
		BH37_0.4-0.5	1020822	0.4 - 0.5	<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
BH38	25 Aug 2023	BH38_0.0-0.1	1020822	0 - 0.1	<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
		BH38-0.4-0.5	1020822	0.4 - 0.5	<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
BH39	25 Aug 2023	BH39_0.0-0.05	1020822	0 - 0.05	<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
		BH39_0.4-0.5	1020822	0.4 - 0.5	<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
BH40	25 Aug 2023	BH40_0.0-0.1	1020822	0 - 0.1	<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
		BH40_0.4-0.5	1020822	0.4 - 0.5	<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
BH41	25 Aug 2023	BH41_0.01-0.1	1020822	0.01 - 0.1	<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
		BH41_0.9-1.0	1020822	0.9 - 1	<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
BH42	25 Aug 2023	BH42_0.0-0.1	1020822	0 - 0.1	<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
		BH42_0.4-0.5	1020822	0.4 - 0.5	<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
BH43	25 Aug 2023	BH43_0.01-0.1	1020822	0.01 - 0.1	<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
		BH43_0.4-0.5	1020822	0.4 - 0.5	<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
BH44	25 Aug 2023	BH44_0.0-0.1	1020822	0 - 0.1	<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
		BH44_0.4-0.5	1020822	0.4 - 0.5	<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
BH45	25 Aug 2023	BH45_0.0-0.05	1020822	0 - 0.05	<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
		BH45_0.4-0.5	1020822	0.4 - 0.5	<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
BH46	25 Aug 2023	BH46_0.0-0.1	1020822	0 - 0.1	<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
		BH46_0.4-0.5	1020822	0.4 - 0.5	<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
BH47	25 Aug 2023	BH47_0.0-0.1	1020822	0 - 0.1	<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
		BH47_0.45-0.5	1020822	0.45 - 0.5	<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
BH48	04 Sep 2023	BH48_0.1-0.2	1024020	0.1 - 0.2	<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
BH49	04 Sep 2023	BH49_0.01-0.1	1024020	0.01 - 0.1	<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
BH50	04 Sep 2023	BH50_0.01-0.1	1024020	0.01 - 0.1	<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
		BH50_1.4-1.5	1025806	1.4 - 1.5	<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
		BH50_2.4-2.5	1024020	2.4 - 2.5	<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
BH51	04 Sep 2023	BH51_0.01-0.1	1024020	0.01 - 0.1	<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
		BH51_0.9-1.0	1025806	0.9 - 1	<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
BH52	04 Sep 2023	BH52_0.01-0.15	1024020	0.01 - 0.15	<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
BH53	04 Sep 2023	BH53_0.01-0.15	1024020	0.01 - 0.15	<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
BH54	04 Sep 2023	BH54_0.0-0.15	1024020	0 - 0.15	<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
		BH54_2.4-2.5	1024020	2.4 - 2.5	<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
BH55	04 Sep 2023	BH55_0.01-0.1	1024020	0.01 - 0.1	<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
BH56	04 Sep 2023	BH56_0.01-0.2	1024020	0.01 - 0.2	<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
BH57	05 Sep 2023	BH57_0-0.1	1024020	0 - 0.1	<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
		BH57_1.4-1.5	1024020	1.4 - 1.5	<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
		BH57_2.9-3.0	1025806	2.9 - 3	<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

Table 1
Analytical Soil Results

					PFAS - Sums					PFAS - Other
					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 Industrial/ commercial (HIL D)					20					
PFAS NEMP 2.0 2020 Public open space (HIL C)					1					
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)					2					
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)					0.01					
SA MFS Site Specific Criteria - Metropolitan (Staffed)					14					
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth (metres)**						
BH21	24 Aug 2023	BH21_0.01-0.11	1020822	0.01 - 0.11	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH21_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH22	24 Aug 2023	BH22_0.01-0.11	1020822	0.01 - 0.11	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH22_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH23	24 Aug 2023	BH23_0.01-0.11	1020822	0.01 - 0.11	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH23_0.2-0.32	1020822	0.2 - 0.32	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH24	24 Aug 2023	BH24_0.5-0.6	1020822	0.5 - 0.6	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH25	24 Aug 2023	BH25_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH26	24 Aug 2023	BH26_0.4-0.5	1020822	0.4 - 0.5	0.22	0.22	0.22	0.22	0.22	<0.005
BH27	24 Aug 2023	BH27_0.01-0.11	1020822	0.01 - 0.11	0.014	0.014	<0.05	0.014	0.014	<0.005
		BH27_0.4-0.45	1020822	0.4 - 0.45	0.0057	0.0057	<0.05	0.0057	<0.01	<0.005
BH28	24 Aug 2023	BH28_0.01-0.11	1020822	0.01 - 0.11	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH28_0.2-0.3	1020822	0.2 - 0.3	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH29	24 Aug 2023	BH29_0.01-0.06	1020822	0.01 - 0.06	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH29_0.25-0.3	1020822	0.25 - 0.3	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH30	24 Aug 2023	BH30_0.01-0.11	1020822	0.01 - 0.11	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH30_0.25-0.3	1020822	0.25 - 0.3	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH31	24 Aug 2023	BH31_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH31_0.25-0.35	1020822	0.25 - 0.35	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH32	24 Aug 2023	BH32_0.01-0.11	1020822	0.01 - 0.11	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH32_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH33	25 Aug 2023	BH33_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH34	25 Aug 2023	BH34_0.01-0.05	1020822	0.01 - 0.05	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH34_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH35	25 Aug 2023	BH35_0.4-0.5	1020822	0.4 - 0.5	0.0076	<0.005	<0.05	<0.005	<0.01	<0.005
BH36	25 Aug 2023	BH36_0.01-0.1	1020822	0.01 - 0.1	0.011	0.0076	<0.05	0.0076	<0.01	<0.005
		BH36_0.4-0.5	1020822	0.4 - 0.5	<0.005	0.011	<0.05	0.011	0.011	<0.005
BH37	25 Aug 2023	BH37_0.01-0.1	1020822	0.01 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH37_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH38	25 Aug 2023	BH38_0.0-0.1	1020822	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH38-0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH39	25 Aug 2023	BH39_0.0-0.05	1020822	0 - 0.05	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH39_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH40	25 Aug 2023	BH40_0.0-0.1	1020822	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH40_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH41	25 Aug 2023	BH41_0.01-0.1	1020822	0.01 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH41_0.9-1.0	1020822	0.9 - 1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH42	25 Aug 2023	BH42_0.0-0.1	1020822	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH42_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH43	25 Aug 2023	BH43_0.01-0.1	1020822	0.01 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH43_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH44	25 Aug 2023	BH44_0.0-0.1	1020822	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH44_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH45	25 Aug 2023	BH45_0.0-0.05	1020822	0 - 0.05	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH45_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH46	25 Aug 2023	BH46_0.0-0.1	1020822	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH46_0.4-0.5	1020822	0.4 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH47	25 Aug 2023	BH47_0.0-0.1	1020822	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH47_0.45-0.5	1020822	0.45 - 0.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH48	04 Sep 2023	BH48_0.1-0.2	1024020	0.1 - 0.2	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH49	04 Sep 2023	BH49_0.01-0.1	1024020	0.01 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH50	04 Sep 2023	BH50_0.01-0.1	1024020	0.01 - 0.1	0.012	0.012	<0.05	0.012	0.012	<0.005
		BH50_1.4-1.5	1025806	1.4 - 1.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH50_2.4-2.5	1024020	2.4 - 2.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH51	04 Sep 2023	BH51_0.01-0.1	1024020	0.01 - 0.1	0.009	0.009	<0.05	0.009	<0.01	<0.005
		BH51_0.9-1.0	1025806	0.9 - 1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH52	04 Sep 2023	BH52_0.01-0.15	1024020	0.01 - 0.15	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH53	04 Sep 2023	BH53_0.01-0.15	1024020	0.01 - 0.15	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH54	04 Sep 2023	BH54_0.0-0.15	1024020	0 - 0.15	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH54_2.4-2.5	1024020	2.4 - 2.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH55	04 Sep 2023	BH55_0.01-0.1	1024020	0.01 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH56	04 Sep 2023	BH56_0.01-0.2	1024020	0.01 - 0.2	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH57	05 Sep 2023	BH57_0-0.1	1024020	0 - 0.1	0.107	0.093	0.107	0.107	0.107	<0.005
		BH57_1.4-1.5	1024020	1.4 - 1.5	0.05	<0.005	0.0775	0.05	0.0694	<0.005
		BH57_2.9-3.0	1025806	2.9 - 3	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005

Table 1
Analytical Soil Results

					PFAS - Perfluoroalkyl Sulfonic Acids					PFAS - Perfluoroalkyl Sulfonic Acids		PFAS - Perfluoroalkyl Carboxylic Acids			PFAS - Perfluoroalkyl Carboxylic 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)
					mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
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	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure										1						10				
PFAS NEMP 2.0 2020 Ecological indirect exposure – Developed sites										0.14										
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)								20		20						50				
PFAS NEMP 2.0 2020 Public open space (HIL C)								1		1						10				
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)								2		2						20				
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)								0.01		0.01						0.1				
SA MFS Site Specific Criteria - Metropolitan (Staffed)																50				
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth (metres)**																
BH58	05 Sep 2023	BH58_0-0.1	1024020	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.019	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH58_2.1-2.3	1025806	2.1 - 2.3	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH58_3.9-4.0	1024020	3.9 - 4	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH59	05 Sep 2023	BH59_0-0.06	1024020	0 - 0.06	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH60	05 Sep 2023	BH60_0.01-0.15	1024020	0.01 - 0.15	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH61	05 Sep 2023	BH61_0.01-0.05	1024020	0.01 - 0.05	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH62	05 Sep 2023	BH62_0.01-0.1	1024020	0.01 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH62_2.4-2.5	1024020	2.4 - 2.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH63	05 Sep 2023	BH63_0.9-1.0	1024020	0.9 - 1	<0.005	<0.005	<0.005	0.016	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH63_1.4-1.5	1025806	1.4 - 1.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH64	05 Sep 2023	BH64_0.01-0.1	1024020	0.01 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.17	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH64_1.4-1.5	1025806	1.4 - 1.5	<0.005	<0.005	<0.005	0.038	0.019	0.083	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH64_1.9-2.0	1028287	1.9 - 2	<0.005	0.012	0.011	0.18	0.0090	<0.005	<0.005	<0.005	<0.005	<0.005	0.021	<0.005	0.0072	<0.005	<0.005	<0.005
		BH64_2.4-2.5	1033088	2.4 - 2.5	0.0074	0.022	0.025	0.21	<0.005	<0.005	<0.005	<0.005	0.0059	0.036	<0.005	0.0061	<0.005	<0.005	<0.005	<0.005
BH65	05 Sep 2023	BH65_0.01-0.1	1024020	0.01 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.063	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH65_1.9-2.0	1025806	1.9 - 2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		BH65_2.4-2.5	1024020	2.4 - 2.5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW01	24 Jul 2023	MW01_0-0.1	1012039	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.0058	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		MW01_1.5-1.7	1012039	1.5 - 1.7	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW02	24 Jul 2023	MW02_0.08-0.2	1012039	0.08 - 0.2	<0.005	<0.005	<0.005	<0.005	<0.005	0.0094	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		MW02_3.9-4.0	1012039	3.9 - 4	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW03	24 Jul 2023	MW03_0.3-0.4	1012039	0.3 - 0.4	<0.005	<0.005	<0.005	0.0064	<0.005	0.036	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
		MW03_5.9-6.0	1012039	5.9 - 6	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SED01	24 Aug 2023	SED01	1020822	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SED02	24 Aug 2023	SED02	1020822	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SED03	24 Aug 2023	SED03	1020822	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS01	14 Jul 2023	SS01	1008159	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.0062	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS02	14 Jul 2023	SS02	1008159	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.0074	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS03	14 Jul 2023	SS03	1008159	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.016	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS04	14 Jul 2023	SS04	1008159	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.066	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS05	18 Jul 2023	SS05	1009731	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.0087	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS06	18 Jul 2023	SS06	1009731	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.029	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS07	18 Jul 2023	SS07	1009731	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.041	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS08	18 Jul 2023	SS08	1009731	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS09	18 Jul 2023	SS09	1009731	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS10	26 Jul 2023	SS10	1011049	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS11	26 Jul 2023	SS11	1011049	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS12	26 Jul 2023	SS12	1011049	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	0.0098	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS13	26 Jul 2023	SS13	1011049	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS14	26 Jul 2023	SS14	1011049	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SS15	26 Jul 2023	SS15	1011049	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Table 1
Analytical Soil Results

					PFAS - Perfluoroalkyl Carboxylic Acids		PFAS - Perfluoroalkyl Sulfonamide		PFAS - Perfluoroalkyl Sulfonamide				PFAS - Perfluoroalkyl Sulfonamide	PFAS - Fluorotelomer Sulfonic Acids			PFAS - Fluorotelomer Sulfonic Acids
					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
EQL					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 Industrial/ commercial (HIL D)																	
PFAS NEMP 2.0 2020 Public open space (HIL C)																	
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)																	
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)																	
SA MFS Site Specific Criteria - Metropolitan (Staffed)																	
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth (metres)**													
BH58	05 Sep 2023	BH58_0-0.1	1024020	0 - 0.1	<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
		BH58_2.1-2.3	1025806	2.1 - 2.3	<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
		BH58_3.9-4.0	1024020	3.9 - 4	<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
BH59	05 Sep 2023	BH59_0-0.06	1024020	0 - 0.06	<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
BH60	05 Sep 2023	BH60_0.01-0.15	1024020	0.01 - 0.15	<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
BH61	05 Sep 2023	BH61_0.01-0.05	1024020	0.01 - 0.05	<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
BH62	05 Sep 2023	BH62_0.01-0.1	1024020	0.01 - 0.1	<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
		BH62_2.4-2.5	1024020	2.4 - 2.5	<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
BH63	05 Sep 2023	BH63_0.9-1.0	1024020	0.9 - 1	<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
		BH63_1.4-1.5	1025806	1.4 - 1.5	<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
BH64	05 Sep 2023	BH64_0.01-0.1	1024020	0.01 - 0.1	<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
		BH64_1.4-1.5	1025806	1.4 - 1.5	<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
		BH64_1.9-2.0	1028287	1.9 - 2	<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
		BH64_2.4-2.5	1033088	2.4 - 2.5	<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
BH65	05 Sep 2023	BH65_0.01-0.1	1024020	0.01 - 0.1	<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
		BH65_1.9-2.0	1025806	1.9 - 2	<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
		BH65_2.4-2.5	1024020	2.4 - 2.5	<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	24 Jul 2023	MW01_0-0.1	1012039	0 - 0.1	<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_1.5-1.7	1012039	1.5 - 1.7	<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	24 Jul 2023	MW02_0.08-0.2	1012039	0.08 - 0.2	<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_3.9-4.0	1012039	3.9 - 4	<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	24 Jul 2023	MW03_0.3-0.4	1012039	0.3 - 0.4	<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_5.9-6.0	1012039	5.9 - 6	<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
SED01	24 Aug 2023	SED01	1020822	0 - 0.1	<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
SED02	24 Aug 2023	SED02	1020822	0 - 0.1	<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
SED03	24 Aug 2023	SED03	1020822	0 - 0.1	<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	14 Jul 2023	SS01	1008159	0 - 0.1	<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	14 Jul 2023	SS02	1008159	0 - 0.1	<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	14 Jul 2023	SS03	1008159	0 - 0.1	<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	14 Jul 2023	SS04	1008159	0 - 0.1	<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
SS05	18 Jul 2023	SS05	1009731	0 - 0.1	<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
SS06	18 Jul 2023	SS06	1009731	0 - 0.1	<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
SS07	18 Jul 2023	SS07	1009731	0 - 0.1	<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
SS08	18 Jul 2023	SS08	1009731	0 - 0.1	<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
SS09	18 Jul 2023	SS09	1009731	0 - 0.1	<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
SS10	26 Jul 2023	SS10	1011049	0 - 0.1	<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
SS11	26 Jul 2023	SS11	1011049	0 - 0.1	<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
SS12	26 Jul 2023	SS12	1011049	0 - 0.1	<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
SS13	26 Jul 2023	SS13	1011049	0 - 0.1	<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
SS14	26 Jul 2023	SS14	1011049	0 - 0.1	<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
SS15	26 Jul 2023	SS15	1011049	0 - 0.1	<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

Table 1
Analytical Soil Results

	PFAS - Sums					PFAS - Other
	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 Industrial/ commercial (HIL D)	20					
PFAS NEMP 2.0 2020 Public open space (HIL C)	1					
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)	2					
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)	0.01					
SA MFS Site Specific Criteria - Metropolitan (Staffed)	14					

Location Code	Date	Field ID	Lab Report Number	Depth (metres)						
BH58	05 Sep 2023	BH58_0-0.1	1024020	0 - 0.1	0.019	0.019	<0.05	0.019	0.019	<0.005
		BH58_2.1-2.3	1025806	2.1 - 2.3	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH58_3.9-4.0	1024020	3.9 - 4	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH59	05 Sep 2023	BH59_0-0.06	1024020	0 - 0.06	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH60	05 Sep 2023	BH60_0.01-0.15	1024020	0.01 - 0.15	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH61	05 Sep 2023	BH61_0.01-0.05	1024020	0.01 - 0.05	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH62	05 Sep 2023	BH62_0.01-0.1	1024020	0.01 - 0.1	0.01	0.01	<0.05	0.01	0.01	<0.005
		BH62_2.4-2.5	1024020	2.4 - 2.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH63	05 Sep 2023	BH63_0.9-1.0	1024020	0.9 - 1	0.016	<0.005	<0.05	0.016	0.016	<0.005
		BH63_1.4-1.5	1025806	1.4 - 1.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH64	05 Sep 2023	BH64_0.01-0.1	1024020	0.01 - 0.1	0.17	0.17	0.17	0.17	0.17	<0.005
		BH64_1.4-1.5	1025806	1.4 - 1.5	0.121	0.083	0.14	0.121	0.121	<0.005
		BH64_1.9-2.0	1028287	1.9 - 2	0.18	0.0072	0.2402	0.1872	0.2202	<0.005
		BH64_2.4-2.5	1033088	2.4 - 2.5	0.21	0.0061	0.3124	0.2161	0.28	<0.005
BH65	05 Sep 2023	BH65_0.01-0.1	1024020	0.01 - 0.1	0.063	0.063	0.063	0.063	0.063	<0.005
		BH65_1.9-2.0	1025806	1.9 - 2	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
		BH65_2.4-2.5	1024020	2.4 - 2.5	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
MW01	24 Jul 2023	MW01_0-0.1	1012039	0 - 0.1	0.0058	0.0058	<0.05	0.0058	<0.01	<0.005
		MW01_1.5-1.7	1012039	1.5 - 1.7	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
MW02	24 Jul 2023	MW02_0.08-0.2	1012039	0.08 - 0.2	0.0094	0.0094	<0.05	0.0094	<0.01	<0.005
		MW02_3.9-4.0	1012039	3.9 - 4	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
MW03	24 Jul 2023	MW03_0.3-0.4	1012039	0.3 - 0.4	0.0424	0.036	<0.05	0.0424	0.0424	<0.005
		MW03_5.9-6.0	1012039	5.9 - 6	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
SED01	24 Aug 2023	SED01	1020822	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
SED02	24 Aug 2023	SED02	1020822	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
SED03	24 Aug 2023	SED03	1020822	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
SS01	14 Jul 2023	SS01	1008159	0 - 0.1	0.0062	0.0062	<0.05	0.0062	<0.01	<0.005
SS02	14 Jul 2023	SS02	1008159	0 - 0.1	0.0074	0.0074	<0.05	0.0074	<0.01	<0.005
SS03	14 Jul 2023	SS03	1008159	0 - 0.1	0.016	0.016	<0.05	0.016	0.016	<0.005
SS04	14 Jul 2023	SS04	1008159	0 - 0.1	0.066	0.066	0.066	0.066	0.066	<0.005
SS05	18 Jul 2023	SS05	1009731	0 - 0.1	0.0087	0.0087	<0.05	0.0087	<0.01	<0.005
SS06	18 Jul 2023	SS06	1009731	0 - 0.1	0.029	0.029	<0.05	0.029	0.029	<0.005
SS07	18 Jul 2023	SS07	1009731	0 - 0.1	0.041	0.041	<0.05	0.041	0.041	<0.005
SS08	18 Jul 2023	SS08	1009731	0 - 0.1	0.014	0.014	<0.05	0.014	0.014	<0.005
SS09	18 Jul 2023	SS09	1009731	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
SS10	26 Jul 2023	SS10	1011049	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
SS11	26 Jul 2023	SS11	1011049	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
SS12	26 Jul 2023	SS12	1011049	0 - 0.1	0.0098	0.0098	<0.05	0.0098	<0.01	<0.005
SS13	26 Jul 2023	SS13	1011049	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
SS14	26 Jul 2023	SS14	1011049	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
SS15	26 Jul 2023	SS15	1011049	0 - 0.1	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005

	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)
	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	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
PFAS NEMP 2.0 2020 Ecological direct exposure						1					
PFAS NEMP 2.0 2020 Ecological indirect exposure						0.01					
PFAS NEMP 2.0 2020 Ecological indirect exposure - developed sites*						0.14					
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)				0.01		0.01					
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)				2		2					
PFAS NEMP 2.0 2020 Public open space (HIL C)				1		1					
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)				20		20					
Metropolitan (staffed) Station**				14		14					
Location Code	**Date**	**Lab Report Number**	**Depth**										
SED01	24 Aug 2023	1020822	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SED02	24 Aug 2023	1020822	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SED03	24 Aug 2023	1020822	0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Note:
*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 is appropriate
**Derivation of site-specific health investigation levels for urban and regional fire stations (GHD, June 2023)

		PFAS - Perfluoroalkyl Carboxylic Acids							PFAS - Perfluoroalkyl Sulfonamide		
	Perfluoropropanesulfonic acid (PFPrS)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)
	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	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
PFAS NEMP 2.0 2020 Ecological direct exposure		10									
PFAS NEMP 2.0 2020 Ecological indirect exposure											
PFAS NEMP 2.0 2020 Ecological indirect exposure - developed sites*											
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)		0.1									
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)		20									
PFAS NEMP 2.0 2020 Public open space (HIL C)		10									
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)		50									
Metropolitan (staffed) Station**		50									
Location Code **Date** **Lab Report Number** **Depth**											
SED01 24 Aug 2023 1020822 0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SED02 24 Aug 2023 1020822 0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
SED03 24 Aug 2023 1020822 0 - 0.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Note:
*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 is appropriate
**Derivation of site-specific health investigation levels for urban and regional fire stations (GHD, June 2023)

		PFAS - Perfluoroalkyl Sulfonamide				PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums	
	Perfluoropropanesulfonic acid (PFPrS)	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)*
	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	0.01	0.005	0.005	0.01	0.005	0.01	0.005	0.005	0.005	0.005
PFAS NEMP 2.0 2020 Ecological direct exposure											
PFAS NEMP 2.0 2020 Ecological indirect exposure											
PFAS NEMP 2.0 2020 Ecological indirect exposure - developed sites*											
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)										0.01	
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)										2	
PFAS NEMP 2.0 2020 Public open space (HIL C)										1	
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)										20	
Metropolitan (staffed) Station**										14	
Location Code	**Date**	**Lab Report Number**	**Depth**								
SED01	24 Aug 2023	1020822	0 - 0.1	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005
SED02	24 Aug 2023	1020822	0 - 0.1	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005
SED03	24 Aug 2023	1020822	0 - 0.1	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005

Note:
*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 is appropriate
**Derivation of site-specific health investigation levels for urban and regional fire stations (GHD, June 2023)

				PFAS - Sums			PFAS - Other
				Perfluoropropanesulfonic acid (PFPrS)	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
EQL				0.005	0.05	0.005	0.01	0.005
PFAS NEMP 2.0 2020 Ecological direct exposure								
PFAS NEMP 2.0 2020 Ecological indirect exposure								
PFAS NEMP 2.0 2020 Ecological indirect exposure - developed sites*								
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)								
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)								
PFAS NEMP 2.0 2020 Public open space (HIL C)								
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)								
Metropolitan (staffed) Station**								
Location Code	**Date**	**Lab Report Number**	**Depth**					
SED01	24 Aug 2023	1020822	0 - 0.1	<0.005	<0.05	<0.005	<0.01	<0.005
SED02	24 Aug 2023	1020822	0 - 0.1	<0.005	<0.05	<0.005	<0.01	<0.005
SED03	24 Aug 2023	1020822	0 - 0.1	<0.005	<0.05	<0.005	<0.01	<0.005

Note:
*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 is appropriate
**Derivation of site-specific health investigation levels for urban and regional fire stations (GHD, June 2023)

					PFAS - Perfluoroalkyl Sulfonic 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)
					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
PFAS NEMP 2.0 2020 Ecological direct exposure										1	
PFAS NEMP 2.0 2020 Ecological indirect exposure										0.01	
PFAS NEMP 2.0 2020 Ecological indirect exposure - developed sites**										0.14	
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)								0.01		0.01	
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)								2		2	
PFAS NEMP 2.0 2020 Public open space (HIL C)								1		1	
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)								20		20	
Metropolitan (staffed) Station***								14		14	
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**							
BH04	18 Jul 2023	BH04_PAVER	1009731	0 - 0.08	<0.005	<0.005	<0.005	<0.005	<0.005	0.08	<0.005
BH05	19 Jul 2023	BH05_PAVER	1009731	0 - 0.08	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH07	18 Jul 2023	BH07_PAVER	1009731	0 - 0.08	<0.005	<0.005	<0.005	<0.005	<0.005	0.0091	<0.005
MW02	24 Jul 2023	MW02_PAVER	1012039	0 - 0.08	<0.005	0.0073	0.0076	0.044	<0.005	0.078	<0.005
MW03	24 Jul 2023	MW03_PAVER	1012039	0 - 0.08	0.0050	0.0095	0.0077	0.046	<0.005	0.124*	<0.005

Note:
*Higher QA/QC result reported
**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 is appropriate
***Derivation of site-specific health investigation levels for urban and regional fire stations (GHD, June 2023)

				PFAS - Perfluoroalkyl Carboxylic Acids						
				Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				0.001	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
PFAS NEMP 2.0 2020 Ecological direct exposure								10		
PFAS NEMP 2.0 2020 Ecological indirect exposure										
PFAS NEMP 2.0 2020 Ecological indirect exposure - developed sites**										
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)								0.1		
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)								20		
PFAS NEMP 2.0 2020 Public open space (HIL C)								10		
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)								50		
Metropolitan (staffed) Station***								50		
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**						
BH04	18 Jul 2023	BH04_PAVER	1009731	0 - 0.08	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH05	19 Jul 2023	BH05_PAVER	1009731	0 - 0.08	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH07	18 Jul 2023	BH07_PAVER	1009731	0 - 0.08	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW02	24 Jul 2023	MW02_PAVER	1012039	0 - 0.08	<0.005	<0.005	0.014	<0.005	<0.005	<0.005	<0.005
MW03	24 Jul 2023	MW03_PAVER	1012039	0 - 0.08	<0.005	<0.005	0.02	<0.005	<0.005	<0.005	<0.005

Note:
*Higher QA/QC result reported
**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 is appropriate
***Derivation of site-specific health investigation levels for urban and regional fire stations (GHD, June 2023)

	PFAS - Perfluoroalkyl Carboxylic Acids				PFAS - Perfluoroalkyl Sulfonamide		
	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)	N-Methyl perfluorooctane sulfonamide (MeFOSA)	N-Ethyl perfluorooctane sulfonamide (EtFOSA)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.0002	0.0002	0.0002	0.0005	0.0002	0.0005	0.0005
PFAS NEMP 2.0 2020 Ecological direct exposure							
PFAS NEMP 2.0 2020 Ecological indirect exposure							
PFAS NEMP 2.0 2020 Ecological indirect exposure - developed sites**							
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)							
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)							
PFAS NEMP 2.0 2020 Public open space (HIL C)							
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)							
Metropolitan (staffed) Station***							
Location Code **Date** **Field ID** **Lab Report Number** **Depth**							
BH04 18 Jul 2023 BH04_PAVER 1009731 0 - 0.08	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH05 19 Jul 2023 BH05_PAVER 1009731 0 - 0.08	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BH07 18 Jul 2023 BH07_PAVER 1009731 0 - 0.08	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW02 24 Jul 2023 MW02_PAVER 1012039 0 - 0.08	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
MW03 24 Jul 2023 MW03_PAVER 1012039 0 - 0.08	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Note:
*Higher QA/QC result reported
**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 is appropriate
***Derivation of site-specific health investigation levels for urban and regional fire stations (GHD, June 2023)

	PFAS - Perfluoroalkyl Sulfonamide				PFAS - Fluorotelomer Sulfonic Acids		
	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)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.0002	0.0005	0.0005	0.0002	0.0005	0.0005	0.0005
PFAS NEMP 2.0 2020 Ecological direct exposure							
PFAS NEMP 2.0 2020 Ecological indirect exposure							
PFAS NEMP 2.0 2020 Ecological indirect exposure - developed sites**							
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)							
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)							
PFAS NEMP 2.0 2020 Public open space (HIL C)							
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)							
Metropolitan (staffed) Station***							

Location Code	Date	Field ID	Lab Report Number	Depth						
BH04	18 Jul 2023	BH04_PAVER	1009731	0 - 0.08	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005
BH05	19 Jul 2023	BH05_PAVER	1009731	0 - 0.08	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005
BH07	18 Jul 2023	BH07_PAVER	1009731	0 - 0.08	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005
MW02	24 Jul 2023	MW02_PAVER	1012039	0 - 0.08	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005
MW03	24 Jul 2023	MW03_PAVER	1012039	0 - 0.08	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005

Note:
*Higher QA/QC result reported
**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 is appropriate
***Derivation of site-specific health investigation levels for urban and regional fire stations (GHD, June 2023)

	PFAS - Fluorotelomer Sulfonic Acids	PFAS - Sums					PFAS - Other
	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)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.0005	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							
PFAS NEMP 2.0 2020 Ecological indirect exposure - developed sites**							
PFAS NEMP 2.0 2020 Residential with garden/accessible soil (HIL A)		0.01					
PFAS NEMP 2.0 2020 Residential w/ min opportunities for soil access (HIL B)		2					
PFAS NEMP 2.0 2020 Public open space (HIL C)		1					
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)		20					
Metropolitan (staffed) Station***		14					
Location Code	**Date**	**Field ID**	**Lab Report Number**	**Depth**							
BH04	18 Jul 2023	BH04_PAVER	1009731	0 - 0.08	<0.005	0.08	0.08	0.08	0.08	0.08	<0.005
BH05	19 Jul 2023	BH05_PAVER	1009731	0 - 0.08	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	<0.005
BH07	18 Jul 2023	BH07_PAVER	1009731	0 - 0.08	<0.005	0.0091	0.0091	<0.05	0.0091	<0.01	<0.005
MW02	24 Jul 2023	MW02_PAVER	1012039	0 - 0.08	<0.005	0.122	0.078	0.1509	0.122	0.1433	<0.005
MW03	24 Jul 2023	MW03_PAVER	1012039	0 - 0.08	<0.005	0.171*	0.083	0.1712	0.129	0.1585	<0.005

Note:
*Higher QA/QC result reported
**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 is appropriate
***Derivation of site-specific health investigation levels for urban and regional fire stations (GHD, June 2023)

				PFAS - Perfluoroalkyl Sulfonic Acids						PFAS - Perfluoroalkyl Carboxylic Acids		
				Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)
				µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2
EQL				0.001	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.001
EnRiskS (2020) dust assessment criteria												
Location Code	**Date**	**Field ID**	**Lab Report Number**									
Gym split air conditioner - screen	25 Jul 2023	DS01	329017	<0.001	<0.001	<0.001	<0.001	<0.001	<0.002	<0.002	<0.002	<0.001
TV Room HVAC air outlet vent	25 Jul 2023	DS04	329017	<0.001	<0.001	0.004	<0.001	0.026	<0.002	<0.002	<0.002	<0.001
Kitchen HVAC air outlet vent surface	25 Jul 2023	DS06	329017	<0.001	<0.001	<0.001	<0.001	0.0023	<0.002	<0.002	<0.002	<0.001

				PFAS - Perfluoroalkyl Carboxylic Acids								PFAS - Perfluoroalkyl Sulfonamide
				Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)
				µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2
EQL				0.001	0.001	0.001	0.005	0.005	0.005	0.005	0.05	0.01
EnRiskS (2020) dust assessment criteria					5							
Location Code	**Date**	**Field ID**	**Lab Report Number**									
Gym split air conditioner - screen	25 Jul 2023	DS01	329017	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.05	<0.01
TV Room HVAC air outlet vent	25 Jul 2023	DS04	329017	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.05	<0.01
Kitchen HVAC air outlet vent surface	25 Jul 2023	DS06	329017	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.05	<0.01

				PFAS - Perfluoroalkyl Sulfonamide						PFAS - Fluorotelomer Sulfonic Acids	PFAS - Fluorotelomer Sulfonic Acids	
				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)
				µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2	µg/100 cm^2
EQL				0.01	0.01	0.002	0.01	0.05	0.002	0.001	0.001	0.002
EnRiskS (2020) dust assessment criteria												
Location Code	**Date**	**Field ID**	**Lab Report Number**									
Gym split air conditioner - screen	25 Jul 2023	DS01	329017	<0.01	<0.01	<0.002	<0.01	<0.05	<0.002	<0.001	<0.001	<0.002
TV Room HVAC air outlet vent	25 Jul 2023	DS04	329017	<0.01	<0.01	<0.002	<0.01	<0.05	<0.002	<0.001	<0.001	<0.002
Kitchen HVAC air outlet vent surface	25 Jul 2023	DS06	329017	<0.01	<0.01	<0.002	<0.01	<0.05	<0.002	<0.001	<0.001	<0.002

				PFAS - Fluorotelomer Sulfonic Acids	PFAS - Sums	
				10:2 Fluorotelomer sulfonic acid (10:2 FTS)	PFAS (Sum of Total)	Sum of PFHxS and PFOS
				µg/100 cm^2	µg/100 cm^2	µg/100 cm^2
EQL				0.002	0.001	0.0002
EnRiskS (2020) dust assessment criteria						0.7
Location Code	**Date**	**Field ID**	**Lab Report Number**			
Gym split air conditioner - screen	25 Jul 2023	DS01	329017	<0.002	<0.001	<0.001
TV Room HVAC air outlet vent	25 Jul 2023	DS04	329017	<0.002	0.030	0.030
Kitchen HVAC air outlet vent surface	25 Jul 2023	DS06	329017	<0.002	0.002	0.0023

			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)
			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
PFAS NEMP 2.0 2020 Drinking Water Quality (ADWG 2022)						0.07		0.07				
PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems								0.13				
NHMRC 2008 Recreational - domestic (based on 10x Drinking Water Value)						0.7		0.7				
Location Code	**Date**	**Lab Report Number**										
TW01	14 Sep 2023	1026487	0.16	0.25	0.18	0.95	0.06	1.0	<0.01	0.06	0.07	0.28
MW01	03 Aug 2023	1013592	<0.01	0.05	0.02	0.08	<0.01	0.19	<0.01	0.35	1.1	0.78
	14 Sep 2023	1026487	0.04	0.03	<0.01	0.02	<0.01	0.03	<0.01	0.15	0.73	0.37
MW02	03 Aug 2023	1013592	12*	30.7*	30	170	8.7*	35*	<0.01	5.1*	10	46.9*
	14 Sep 2023	1026487	6.1*	13*	12*	96*	7.9*	32*	<0.01	2.6*	5.4*	25*
MW03	14 Sep 2023	1026487	0.03	0.02	<0.01	0.04	<0.01	0.04	<0.01	<0.05	<0.01	0.01

Note:
*Higher QA/QC result reported

			PFAS - Perfluoroalkyl Carboxylic Acids								PFAS - Perfluoroalkyl Sulfonamide
			Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorooctane sulfonamide (FOSA)
			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	0.01	0.02
PFAS NEMP 2.0 2020 Drinking Water Quality (ADWG 2022)				0.56							
PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems				220							
NHMRC 2008 Recreational - domestic (based on 10x Drinking Water Value)				5.6							
Location Code	**Date**	**Lab Report Number**									
TW01	14 Sep 2023	1026487	0.04	0.07	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
MW01	03 Aug 2023	1013592	0.55	0.12	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
	14 Sep 2023	1026487	0.12	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
MW02	03 Aug 2023	1013592	4.6*	11*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
	14 Sep 2023	1026487	2.1*	6.5*	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
MW03	14 Sep 2023	1026487	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.05

Note:
*Higher QA/QC result reported

			PFAS - Perfluoroalkyl Sulfonamide						PFAS - Fluorotelomer Sulfonic Acids	
			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)
			µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL			0.05	0.05	0.02	0.05	0.05	0.02	0.01	0.05
PFAS NEMP 2.0 2020 Drinking Water Quality (ADWG 2022)										
PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems										
NHMRC 2008 Recreational - domestic (based on 10x Drinking Water Value)										
Location Code	**Date**	**Lab Report Number**								
TW01	14 Sep 2023	1026487	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05
MW01	03 Aug 2023	1013592	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	0.10
	14 Sep 2023	1026487	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05
MW02	03 Aug 2023	1013592	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	0.94*
	14 Sep 2023	1026487	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	0.25*
MW03	14 Sep 2023	1026487	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.01	<0.05

Note:
*Higher QA/QC result reported

			PFAS - Fluorotelomer Sulfonic Acids		PFAS - Sums					PFAS - Other
			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
EQL			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
PFAS NEMP 2.0 2020 Drinking Water Quality (ADWG 2022)					0.07					
PFAS NEMP 2.0 2020 Freshwater - 95% - slightly to moderately disturbed systems										
NHMRC 2008 Recreational - domestic (based on 10x Drinking Water Value)					0.7					
Location Code	**Date**	**Lab Report Number**								
TW01	14 Sep 2023	1026487	<0.01	<0.01	1.95	1.07	3.12	2.02	2.72	<0.01
MW01	03 Aug 2023	1013592	<0.01	<0.01	0.27	0.31	3.36	0.39	3.32	<0.01
	14 Sep 2023	1026487	<0.01	<0.01	0.05	0.05	1.51	0.07	1.47	<0.01
MW02	03 Aug 2023	1013592	<0.01	<0.01	200	46*	342.46*	208.7	296*	0.15*
	14 Sep 2023	1026487	<0.01	<0.01	128*	38.5*	208.89*	134.5*	182.85*	<0.01
MW03	14 Sep 2023	1026487	<0.01	<0.01	0.08	0.04	0.14	0.08	0.11	<0.01

Note:
*Higher QA/QC result reported

Appendix H

Well Permits

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:	441676
Expiry Date:	30/06/2024

Permission is hereby granted to: SOUTH AUSTRALIAN METROPOLTIAN FIRE SERVICE
99 WAKEFIELD STREET
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:

   CR 5759/678
   Section 1655
   Hundred of Yatala

2. 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.
3. 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.
4. This work may be subject to inspection by the Department's Drilling Inspectors.
5. 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.
6. Activities shall not have an unacceptable detrimental impact on cultural, heritage or social values.
7. The activity must not adversely affect water-dependent ecosystems nearby.
8. 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.

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

9. 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.
10. The authorised activity must be undertaken by a licensed driller.
11. 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.
12. Water samples are required from all wells drilled in respect of this permit.
13. Strata samples are not required.
14. 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.
15. All wells must be drilled vertical unless written permission is obtained from the Minister.
16. 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.
17. 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.
18. A lithological log is to be submitted with the drillers well construction report from all wells drilled in respect of this permit as per the National Environmental Protection (assessment of Site Contamination) measure 1999.
19. Wells are to be backfilled when no longer required for ongoing monitoring and investigation purposes.
20. The well is not to penetrate beyond a depth of 30 metres unless approved by the Regional Hydrogeologist.
21. 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. 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.
2. This permit is not transferable.
3. 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.
4. 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.
5. This permit is not an approval to clear native vegetation.
6. 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.

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

7. Due to potential land contamination issues it is recommended that a hydrogeological assessment be carried out to determine the long term prospects for groundwater quality and quantity with regard to the site and desired use.
8. This permit does not authorise the taking of water from the well for any purpose other than testing.
9. 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: 30/06/2023

Dean Zeven
Team Leader [Limestone Coast]
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:	441674
Expiry Date:	30/06/2024

Permission is hereby granted to: SOUTH AUSTRALIAN METROPOLTIAN FIRE SERVICE
99 WAKEFIELD STREET
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:

   CR 5759/678
   Section 1655
   Hundred of Yatala

2. 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.
3. 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.
4. This work may be subject to inspection by the Department's Drilling Inspectors.
5. 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.
6. Activities shall not have an unacceptable detrimental impact on cultural, heritage or social values.
7. The activity must not adversely affect water-dependent ecosystems nearby.
8. 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.

PERMIT to undertake a WATER AFFECTING ACTIVITY

pursuant to section 112 of the Landscape South Australia Act 2019

WELL PERMIT

9. 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.
10. The authorised activity must be undertaken by a licensed driller.
11. 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.
12. Water samples are required from all wells drilled in respect of this permit.
13. Strata samples are not required.
14. 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.
15. All wells must be drilled vertical unless written permission is obtained from the Minister.
16. 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.
17. 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.
18. A lithological log is to be submitted with the drillers well construction report from all wells drilled in respect of this permit as per the National Environmental Protection (assessment of Site Contamination) measure 1999.
19. Wells are to be backfilled when no longer required for ongoing monitoring and investigation purposes.
20. The well is not to penetrate beyond a depth of 30 metres unless approved by the Regional Hydrogeologist.
21. 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. 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.
2. This permit is not transferable.
3. 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.
4. 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.
5. This permit is not an approval to clear native vegetation.
6. 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.

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

7. Due to potential land contamination issues it is recommended that a hydrogeological assessment be carried out to determine the long term prospects for groundwater quality and quantity with regard to the site and desired use.
8. This permit does not authorise the taking of water from the well for any purpose other than testing.
9. 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: 30/06/2023

Dean Zeven
Team Leader [Limestone Coast]
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:	441675
Expiry Date:	30/06/2024

Permission is hereby granted to: SOUTH AUSTRALIAN METROPOLTIAN FIRE SERVICE
99 WAKEFIELD STREET
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:

   CR 5759/678
   Section 1655
   Hundred of Yatala

2. 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.
3. 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.
4. This work may be subject to inspection by the Department's Drilling Inspectors.
5. 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.
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WELL PERMIT

9. 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.
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20. The well is not to penetrate beyond a depth of 30 metres unless approved by the Regional Hydrogeologist.
21. 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. 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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4. 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.
5. This permit is not an approval to clear native vegetation.
6. 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.

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

7. Due to potential land contamination issues it is recommended that a hydrogeological assessment be carried out to determine the long term prospects for groundwater quality and quantity with regard to the site and desired use.
8. This permit does not authorise the taking of water from the well for any purpose other than testing.
9. 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: 30/06/2023

Dean Zeven
Team Leader [Limestone Coast]
Delegate of Minister for Climate, Environment and Water

Appendix I

Survey Results

`

To: Terrence Wilson
Company: GHD
Phone: 8 8111 6514

From: Lincoln Jeffery
Phone: 0414 840 569
Email: Lincoln@linkupconstructionsurveys.com.au

Date: 14/9/2023

Monitoring well coordinates – Oakden MFS
700 Grand Junction Rd, Oakden

Well or Bore No.	Easting GDA20	Northing GDA20	R.L. Top of Casing A.H.D.	Natural Surface A.H.D.
MW01	284398.673	6141425.042	81.343	81.401
MW02	284418.052	6141376.081	81.471	81.558
MW03	284403.515	6141398.202	81.588	81.752
TW01	284380.523	6141394.402	80.945	80.547
TW02	284394.948	6141384.599	81.226	80.972

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: MFS OAKDEN DSI
Proj. No.: 12611126
Sampler: TW/LW
Date: 03/08/2023
Round

Sampling Information

Purge Method:
Sample Method: LOW FLOW (PERI-PUMP)
WQ Meter Type: YSI QUATTRO PRO
Flow Cell: (Y) / N Pump Depth: 3.8 m
WLevel Meter Type: Dip / Fox / (Int.Fce) / Gge
Field Filtered? Y / (N) (filter vessel, disposable filter/syringe)

Bore Information

SWL(mbTOC): 1.735 m Logic Check:
Screen: From: to: m Stick Up: m
NAPL Check: Bore Diam.: mm
Ref.datum: Well Cap Secure?
Bore Depth: 3.975 m

Time (...A.M.)	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*		
10:25								START	pale brown, no odour, no sheen, low turbidity
10:29		19.5	7.17	9639	0.87	18.7	1.063		
10:33		19.1	7.2	8779	1.07	23.9	1.049		
10:36		18.8	7.19	6671	1.46	25.6	1.091		
10:40		18.7	7.46	4891	1.38	25.9	1.1045		
10:43		18.6	7.58	3702	0.72	17.7	1.159		clear to pale brown, no odour, no sheen
10:47		18.9	7.7	3514	0.52	2.9	1.163		low turbidity
10:51		18.7	7.53	2223	0.83	-8.5	1.181		
10:54		18.6	7.53	3297	1.44	-12.8	1.2194		
10:57		18.5	7.53	3215	1.61	-15.0	1.205		
11:00		18.5	7.54	3216	1.64	-14.4	1.216	FINISH	sample at this time
									Total purge volume: 20L

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	Sampling Information	Bore Information
Client: MFS	Purge Method:	SWL(mbTOC): 1.033 m
Project: MFS OAKDEN DSI	Sample Method: LOW FLOW (PERI-PUMP)	Logic Check:
Proj. No.: 12611126	WQ Meter Type: YSI QUATTRO PRO	Screen: From: to: m
Sampler: TW/LW	Flow Cell: (Y) / N	Pump Depth: 3.8 m
Date: 03/08/2023	WLevel Meter Type: Dip / Fox / (Int.Fce) / Gge	Stick Up: m
Round	Field Filtered? Y / (N) (filter vessel, disposable filter/syringe)	NAPL Check:
		Bore Diam.: mm
		Ref.datum:
		Well Cap Secure?
		Bore Depth: 4.023 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*		
11:36								START	pale brown, medium turbidity, no odour, no sheen
11:41		19.7	6.82	821	9.33	73.9	1.165		
11:45		19	6.48	827	9.12	277.1	1.185		
11:49		18.7	6.81	660	9.03	343	1.211		
11:54		18.5	6.96	2595	0.95	424.6	1.204		clear to pale brown, low turbidity, no odour, no sheen
11:58		18.4	6.84	2437	2.29	418	1.205		
12:02		18.4	6.79	3230	2.74	416.1	1.215		clear to pale yellow, low turbidity, no odour
12:06		18.4	6.81	2944	2.90	417.5	1.221		no sheen
12:11		18.4	6.82	2633	2.93	415.9	1.222		
12:15		18.4	6.48	2445	2.91	411.2	1.219		
12:19		18.4	6.82	2520	2.90	414.2	1.225		
12:24		18.4	6.83	2514	2.89	418.2	1.226		
12:28		18.3	6.81	2514	2.88	419.2	1.236	FINISH	sample taken at this line.
									Total purge volume: 23L

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

QC01A / QC01B

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: MW 01

Job Information

Client: MFS
Project: MFS OAKDEN OSI
Proj. No.: 12611126
Sampler:
Date: 14/9/2023
Round

Sampling Information

Purge Method:
Sample Method: Low Flow (Perpump)
WQ Meter Type: YSI
Flow Cell: (Y) N Pump Depth: 3.8 m
WLevel Meter Type: Dip / Fox / (Int.Fce) / Gge
Field Filtered? Y / (N) (filter vessel, disposable filter/syringe)

Bore Information

SWL(mbTOC): 1.041 m Logic Check:
Screen: From: to: m Stick Up: m
NAPL Check: Bore Diam.: 50 mm
Ref.datum: Well Cap Secure?
Bore Depth: 4 meters 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*			
10:15 am							1.041		start of bit yellowish clear, low turbidity, low sediment load, no odour no sheen.
10:18 am		19.3	6.87	14.727	0.04	-143.5	1.025		
10:23 am		19.2	7.07	12 302	0.08	-147.7	1.845		
10:28		19.2	7.12	9469	0.65	-114.8	1.862		
10:33		18.9	7.23	6814	0.62	-107.0	1.865		
10:37		18.9	7.25	7589	0.63	-99.0	1.863		
10:41		18.9	7.15	9924	0.57	-93.3	1.864		
10:46		19.2	7.03	12341	0.54	-104.3	1.865		
10:51		19.6	6.98	13630	0.69	-109.0	1.862		
10:55		19.5	6.94	13852	0.73	-104.9	1.861		
10:58		19.8	6.92	13921	0.65	-102.3	1.859		sample at 10:59 am; volume purge 13 liters

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: NW02

Job Information	Sampling Information	Bore Information
Client: MFS	Purge Method:	SWL(mbTOC): 1.287 m
Project: MFS OAKDEN DSI	Sample Method: Low flow peristaltic pump	Logic Check:
Proj. No.: 12611126	WQ Meter Type: YSI 3.1.7.8	Screen: From: to: m
Sampler:	Flow Cell: Y / N Pump Depth: 3.0 m	Stick Up: m
Date: 14/09/2023	WLevel Meter Type: Dip / Fox / Int.Fce / Gge	NAPL Check: Bore Diam.: 50 mm
Round	Field Filtered? Y / N (filter vessel, disposable filter/syringe)	Ref.datum: Well Cap Secure?
		Bore Depth: 3.974 m

Time (a.m.....)	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*			
11:37							1.287		Pale yellow, low turbidity, low sediment load, no odour
11:42		19.7	7.09	11605	0.04	64.3	1.452		no sheen (start)
11:47		19.5	7.12	9186	0.05	45.1	1.455		
11:52		19.1	7.05	7571	0.31	47.7	1.460		
11:57		19.1	7.05	7623	0.44	44.7	1.467		
12:02		19.0	7.06	7684	0.65	40.5	1.466		
12:07		19.0	7.06	7652	0.78	38.2	1.482		
12:12		19.0	7.07	7644	0.98	37.0	1.480		
12:17		18.8	7.07	7614	1.04	36.9	1.491		
12:22		18.9	7.08	7612	1.12	37.9	1.482		Clear to pale yellow, low turbidity, low sediment load, no odour, no sheen
									Sample at 12:23 pm, volume purge 15L

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

Client: MFS
Project: MFS OAKDEN DSI
Proj. No.: 12611126
Sampler:
Date: 14/09/23
Round

Sampling Information

Purge Method:
Sample Method: Low flow (peri pump)
WQ Meter Type:
Flow Cell: (Y) / N Pump Depth: 3.7 m
WLevel Meter Type: Dip / Fox / Int.Fce / Gge
Field Filtered? Y / (N) (filter vessel, disposable filter/syringe)

Bore Information

SWL(mbTOC): 1.170 m Logic Check:
Screen: From: to: m Stick Up: m
NAPL Check: Bore Diam.: 50 mm
Ref.datum: Well Cap Secure?
Bore Depth: 3.975 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			
1:24							1.170		cloudy/murky, pale brown, high turbidity
1:29		17.5	7.51	6770	3.69	+124.0	1.275		high sediment load, no sheen, no odour
1:34		17.4	7.56	4304	3.57	121.9	1.268		start: 1:24 pm
1:39		17.2	7.6	2822	1.33	104.3	1.276		
1:44		17.0	7.64	2377	0.63	90.7	1.281		
1:49		16.9	7.65	2301	0.54	78.3	1.286		
1:54		16.9	7.67	2181	0.5	69.3	1.285		
1:59		16.7	7.69	2009	0.48	61.3	1.291		
2:04		16.8	7.69	2043	0.50	56.0	1.286		
2:09		16.8	7.71	1989	0.51	51.6	1.285		sampling at 2:10 pm volume purge: 14 L
									clear, low turbidity, low sediment load
									no sheen, no odour.

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: TW01

Job Information

Client: MFS
Project: R611826
Proj. No.: MFS OAKBTH DS1
Sampler:
Date: 14/9/23
Round

Sampling Information

Purge Method:
Sample Method: Low flow (peristaltic pump)
WQ Meter Type:
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): 1.439 m Logic Check:
Screen: From:.....to..... m Stick Up:..... m
NAPL Check: Bore Diam.: 50 mm
Ref.datum: Well Cap Secure?
Bore Depth: 3 meters 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*			
2:35		19.9	7.79	0994	1.39	102.6	1.439		start purge dry brown murky, high turbidity, high sediment load no odour, no sheen.

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

QA/QC Report

Table 1
RPD Results - Soil and Pavers

Lab Report Number			1008159			1008159	EM2312852		1009731			1009731	EM2313267		
Field ID			SS04	FD01		SS04	FS01		BH07_0.08-0.2	FD02		BH07_0.08-0.2	FS02		
Location Code			SS04	SS04		SS04	SS04		BH07	BH07		BH07	BH07		
Matrix Type			Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		
Date			14 Jul 2023	14 Jul 2023		14 Jul 2023	14 Jul 2023		18 Jul 2023	18 Jul 2023		18 Jul 2023	18 Jul 2023		
Sample Type			Normal	Field_D	RPD	Normal	Interlab_D	RPD	Normal	Field_D	RPD	Normal	Interlab_D	RPD	
	Unit	EQL													
Misc.															
% Moisture	%	1	16	17	6	16	-	-	7.0	6.6	6	7.0	-	-	
Inorganics															
Moisture (%)	%	0.1	-	-	-	-	16.4	-	-	-	-	-	7.6	-	
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	<0.0002	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	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0003	0	<0.005	<0.005	0	<0.005	<0.0002	0	
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	0.066	0.055	18	0.066	0.0609	8	<0.005	<0.005	0	<0.005	0.0006	0	
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0005	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	
Perfluoropentanoic acid (PFPeA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	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	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	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	<0.0002	0	
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0003	0	<0.005	<0.005	0	<0.005	<0.0002	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	
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	<0.0002	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	
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	<0.0002	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	
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	0.0026	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	0.066	0.055	18	0.066	0.0612	8	<0.005	<0.005	0	<0.005	0.0006	0	
Sum of US EPA PFAS (PFOS + PFOA)*	mg/kg	0.005	0.066	0.055	18	0.066	-	-	<0.005	<0.005	0	<0.005	-	-	
PFAS (Sum of Total)	mg/kg	0.0002	0.066	0.055	18	0.066	0.0620	6	<0.05	<0.05	0	<0.05	0.0032	0	
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	mg/kg	0.005	0.066	0.055	18	0.066	-	-	<0.005	<0.005	0	<0.005	-	-	
PFAS (Sum of Total)(WA DER List)	mg/kg	0.0002	0.066	0.055	18	0.066	0.0615	7	<0.01	<0.01	0	<0.01	0.0032	0	
PFAS															
Perfluorononane sulfonate (PFNS)	mg/kg	0.005	<0.005	<0.005	0	<0.005	-	-	<0.005	<0.005	0	<0.005	-	-	

***RPDs have only been considered where a concentration is greater than 10 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 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.**

	Lab Report Number		1009731			1009731	EM2313267		1009731			1009731	EM2313267		1012039			1012039	EM2313731	
	Field ID		SS06	FD03		SS06	FS03		BH02_0-0.1	FD04		BH02_0-0.1	FS04		MW02_0.08-0.2	FD06		MW02_0.08-0.2	FS06	
	Location Code		SS06	SS06		SS06	SS06		BH02	BH02		BH02	BH02		MW02	MW02		MW02	MW02	
	Matrix Type		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
	Date		18 Jul 2023	18 Jul 2023		18 Jul 2023	18 Jul 2023		19 Jul 2023	19 Jul 2023		19 Jul 2023	19 Jul 2023		24 Jul 2023	24 Jul 2023		24 Jul 2023	24 Jul 2023	
	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	19	20	5	19	-	-	22	18	20	22	-	-	7.3	6.3	15	7.3	-	-
Inorganics																				
Moisture (%)	%	0.1	-	-	-	-	19.0	-	-	-	-	-	24.2	-	-	-	-	-	6.2	-
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	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0006	0	<0.005	<0.005	0	<0.005	0.0043	0	<0.005	<0.005	0	<0.005	0.0004	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	0.0004	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	0.029	0.022	27	0.029	0.0215	30	0.11	0.082	29	0.11	0.0755	**37**	0.0094	<0.005	-	0.0094	0.0053	**56**
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	0.0004	0	<0.005	<0.005	0	<0.005	0.0007	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	<0.0002	0	<0.005	<0.005	0	<0.005	0.0003	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	<0.0002	0	<0.005	<0.005	0	<0.005	0.0004	0	<0.005	<0.005	0	<0.005	<0.0002	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	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0003	0	<0.005	<0.005	0	<0.005	0.0006	0	<0.005	<0.005	0	<0.005	<0.0002	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	0.0004	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	0.0005	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	0.0012	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	0.029	0.022	27	0.029	0.0221	27	0.11	0.082	29	0.11	0.0798	**32**	0.0094	<0.005	-	0.0094	0.0057	**49**
Sum of US EPA PFAS (PFOS + PFOA)*	mg/kg	0.005	0.029	0.022	27	0.029	-	-	0.11	0.082	29	0.11	-	-	0.0094	<0.005	-	0.0094	-	-
PFAS (Sum of Total)	mg/kg	0.0002	<0.05	<0.05	0	<0.05	0.0229	0	0.11	0.082	29	0.11	0.0825	29	<0.05	<0.05	0	<0.05	0.0076	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	mg/kg	0.005	0.029	0.022	27	0.029	-	-	0.11	0.082	29	0.11	-	-	0.0094	<0.005	-	0.0094	-	-
PFAS (Sum of Total)(WA DER List)	mg/kg	0.0002	0.029	0.022	27	0.029	0.0224	26	0.11	0.082	29	0.11	0.0811	30	<0.01	<0.01	0	<0.01	0.0069	0
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	-	-

***RPDs have only been considered where a concentration is greater than 10 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 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.**

	Lab Report Number		1012039			1012039	EM2313731		1011049			1011049	EM2313574		1020822			1020822	EM2315510	
	Field ID		MW03_PAVER	FD05		MW03_PAVER	FS05		SS14	FD07		SS14	FS07		BH16_0.1-0.2	FD01		BH16_0.1-0.2	FS01	
	Location Code		MW03	MW03		MW03	MW03		SS14	SS14		SS14	SS14		BH16	BH16		BH16	BH16	
	Matrix Type		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
	Date		24 Jul 2023	24 Jul 2023		24 Jul 2023	24 Jul 2023		26 Jul 2023	26 Jul 2023		26 Jul 2023	26 Jul 2023		23 Aug 2023	23 Aug 2023		23 Aug 2023	23 Aug 2023	
	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	3.1	3.2	3	3.1	-	-	17	17	0	17	-	-	23	19	19	23	-	-
Inorganics																				
Moisture (%)	%	0.1	-	-	-	-	3.6	-	-	-	-	-	17.1	-	-	-	-	-	22.7	-
PFAS - Perfluoroalkyl Sulfonic Acids																				
Perfluoropropanesulfonic acid (PFPrS)	mg/kg	0.005	0.0050	<0.005	0	0.0050	-	-	<0.005	<0.005	0	<0.005	-	-	<0.005	<0.005	0	<0.005	-	-
Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.0002	0.0095	<0.005	-	0.0095	0.0077	21	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	0.0077	<0.005	-	0.0077	0.0050	43	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	0.046	0.035	27	0.046	0.0466	1	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	0.0004	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0045	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	0.083	0.059	34	0.083	0.124	40	<0.005	<0.005	0	<0.005	0.0008	0	<0.005	<0.005	0	<0.005	0.0014	0
Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0004	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	0.002	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	0.0041	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	0.02	0.0098	68	0.02	0.0189	6	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0015	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0034	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	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	0.0008	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	0.129	0.094	31	0.129	0.171	28	<0.005	<0.005	0	<0.005	0.0008	0	<0.005	<0.005	0	<0.005	0.0018	0
Sum of US EPA PFAS (PFOS + PFOA)*	mg/kg	0.005	0.083	0.059	34	0.083	-	-	<0.005	<0.005	0	<0.005	-	-	<0.005	<0.005	0	<0.005	-	-
PFAS (Sum of Total)	mg/kg	0.0002	0.1712	0.1038	49	0.1712	0.219	25	<0.05	<0.05	0	<0.05	0.0008	0	<0.05	<0.05	0	<0.05	0.0018	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	mg/kg	0.005	0.129	0.094	31	0.129	-	-	<0.005	<0.005	0	<0.005	-	-	<0.005	<0.005	0	<0.005	-	-
PFAS (Sum of Total)(WA DER List)	mg/kg	0.0002	0.1585	0.1038	42	0.1585	0.208	27	<0.01	<0.01	0	<0.01	0.0008	0	<0.01	<0.01	0	<0.01	0.0018	0
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	-	-

***RPDs have only been considered where a concentration is greater than 10 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 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.**

Lab Report Number			1020822			1020822	EM2315510		1020822			1020822	EM2315510		1020822			1020822	EM2315510	
Field ID			BH12_0.6-0.7	FD02		BH12_0.6-0.7	FS02		BH21_0.01-0.11	FD03		BH21_0.01-0.11	FS03		BH25_0.4-0.5	FD04		BH25_0.4-0.5	FS04	
Location Code			BH12	BH12		BH12	BH12		BH21	BH21		BH21	BH21		BH25	BH25		BH25	BH25	
Matrix Type			Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
Date			24 Aug 2023	24 Aug 2023		24 Aug 2023	24 Aug 2023		24 Aug 2023	24 Aug 2023		24 Aug 2023	24 Aug 2023		24 Aug 2023	24 Aug 2023		24 Aug 2023	24 Aug 2023	
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	16	15	6	16	-	-	16	17	6	16	-	-	24	24	0	24	-	-
Inorganics																				
Moisture (%)	%	0.1	-	-	-	-	17.7	-	-	-	-	-	17.8	-	-	-	-	-	26.2	-
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	0.0086	0.015	**54**	0.0086	0.0052	**49**	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.005	0.0082	-	<0.005	0.0038	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.0002	0.037	0.048	26	0.037	0.0212	**54**	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	0.0008	0
Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0004	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	0.014	0.012	15	0.014	0.0074	**62**	<0.005	<0.005	0	<0.005	0.0004	0	<0.005	<0.005	0	<0.005	0.0026	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	0.0012	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorohexanoic acid (PFHxA)	mg/kg	0.0002	0.0055	0.01	**58**	0.0055	0.0053	4	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	0.0008	0
Perfluoroheptanoic acid (PFHpA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0004	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	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	<0.0002	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	0.051	0.06	16	0.051	0.0286	**56**	<0.005	<0.005	0	<0.005	0.0004	0	<0.005	<0.005	0	<0.005	0.0034	0
Sum of US EPA PFAS (PFOS + PFOA)*	mg/kg	0.005	0.014	0.012	15	0.014	-	-	<0.005	<0.005	0	<0.005	-	-	<0.005	<0.005	0	<0.005	-	-
PFAS (Sum of Total)	mg/kg	0.0002	0.0651	0.0932	**36**	0.0651	0.0454	**36**	<0.05	<0.05	0	<0.05	0.0004	0	<0.05	<0.05	0	<0.05	0.0042	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	mg/kg	0.005	0.051	0.06	16	0.051	-	-	<0.005	<0.005	0	<0.005	-	-	<0.005	<0.005	0	<0.005	-	-
PFAS (Sum of Total)(WA DER List)	mg/kg	0.0002	0.0651	0.085	27	0.0651	0.0412	**45**	<0.01	<0.01	0	<0.01	0.0004	0	<0.01	<0.01	0	<0.01	0.0042	0
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	-	-

***RPDs have only been considered where a concentration is greater than 10 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 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.**

	Lab Report Number		1020822			1020822	EM2315510		1020822			1020822	EM2315510		1020822			1020822	EM2315510	
	Field ID		BH31_0.25-0.35	FD05		BH31_0.25-0.35	FS05		BH37_0.01-0.1	FD06		BH37_0.01-0.1	FS06		BH41_0.9-1.0	FD07		BH41_0.9-1.0	FS07	
	Location Code		BH31	BH31		BH31	BH31		BH37	BH37		BH37	BH37		BH41	BH41		BH41	BH41	
	Matrix Type		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
	Date		24 Aug 2023	24 Aug 2023		24 Aug 2023	24 Aug 2023		25 Aug 2023	25 Aug 2023		25 Aug 2023	25 Aug 2023		25 Aug 2023	25 Aug 2023		25 Aug 2023	25 Aug 2023	
	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	16	21	27	16	-	-	6.9	10	37	6.9	-	-	12	14	15	12	-	-
Inorganics																				
Moisture (%)	%	0.1	-	-	-	-	27.5	-	-	-	-	-	8.9	-	-	-	-	-	15.2	-
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	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorohexane sulfonic acid (PFHxS)	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	0.0003	0
Perfluoroheptane sulfonic acid (PFHpS)	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
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0008	0	<0.005	<0.005	0	<0.005	0.0015	0	<0.005	<0.005	0	<0.005	0.0008	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	0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	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	0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	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	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorooctanoic acid (PFOA)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0002	0	<0.005	<0.005	0	<0.005	0.0003	0	<0.005	<0.005	0	<0.005	<0.0002	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	<0.005	<0.005	0	<0.005	0.0008	0	<0.005	<0.005	0	<0.005	0.0015	0	<0.005	<0.005	0	<0.005	0.0011	0
Sum of US EPA PFAS (PFOS + PFOA)*	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	-	-
PFAS (Sum of Total)	mg/kg	0.0002	<0.05	<0.05	0	<0.05	0.0014	0	<0.05	<0.05	0	<0.05	0.0018	0	<0.05	<0.05	0	<0.05	0.0011	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	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	-	-
PFAS (Sum of Total)(WA DER List)	mg/kg	0.0002	<0.01	<0.01	0	<0.01	0.0014	0	<0.01	<0.01	0	<0.01	0.0018	0	<0.01	<0.01	0	<0.01	0.0011	0
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	-	-

***RPDs have only been considered where a concentration is greater than 10 times the EQL.**

****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 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.**

	Lab Report Number		1020822			1020822	EM2315510		1024020			1024020	EM2316158		1024020			1024020	EM2316158	
	Field ID		BH46_0.0-0.1	FD08		BH46_0.0-0.1	FS08		BH50_2.4-2.5	QC01A		BH50_2.4-2.5	QC01B		BH54_2.4-2.5	QC02A		BH54_2.4-2.5	QC02B	
	Location Code		BH46	BH46		BH46	BH46		BH50	BH50		BH50	BH50		BH54	BH54		BH54	BH54	
	Matrix Type		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
	Date		25 Aug 2023	25 Aug 2023		25 Aug 2023	25 Aug 2023		04 Sep 2023	05 Sep 2023		04 Sep 2023	04 Sep 2023		04 Sep 2023	05 Sep 2023		04 Sep 2023	04 Sep 2023	
	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	16	27	51	16	-	-	21	20	5	21	-	-	18	17	6	18	-	-
Inorganics																				
Moisture (%)	%	0.1	-	-	-	-	16.9	-	-	-	-	-	21.6	-	-	-	-	-	18.9	-
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	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorohexane sulfonic acid (PFHxS)	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
Perfluoroheptane sulfonic acid (PFHpS)	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
Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.0002	<0.005	<0.005	0	<0.005	0.0010	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	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	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	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	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	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	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorooctanoic acid (PFOA)	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
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	<0.005	<0.005	0	<0.005	0.0010	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Sum of US EPA PFAS (PFOS + PFOA)*	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	-	-
PFAS (Sum of Total)	mg/kg	0.0002	<0.05	<0.05	0	<0.05	0.0010	0	<0.05	<0.05	0	<0.05	<0.0002	0	<0.05	<0.05	0	<0.05	<0.0002	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	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	-	-
PFAS (Sum of Total)(WA DER List)	mg/kg	0.0002	<0.01	<0.01	0	<0.01	0.0010	0	<0.01	<0.01	0	<0.01	<0.0002	0	<0.01	<0.01	0	<0.01	<0.0002	0
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	-	-

***RPDs have only been considered where a concentration is greater than 10 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 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.**

	Lab Report Number		1024020			1024020	EM2316158		1024020			1024020	EM2316158		1024020			1024020	EM2316158	
	Field ID		BH58_3.9-4.0	QC03A		BH58_3.9-4.0	QC03B		BH62_2.4-2.5	QC04A		BH62_2.4-2.5	QC04B		BH65_2.4-2.5	QC05A		BH65_2.4-2.5	QC05B	
	Location Code		BH58	BH58		BH58	BH58		BH62	BH62		BH62	BH62		BH65	BH65		BH65	BH65	
	Matrix Type		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil		Soil	Soil	
	Date		05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023		05 Sep 2023	05 Sep 2023	
	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	22	21	5	22	-	-	21	21	0	21	-	-	21	20	5	21	-	-
Inorganics																				
Moisture (%)	%	0.1	-	-	-	-	22.6	-	-	-	-	-	22.9	-	-	-	-	-	24.1	-
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	<0.005	<0.005	0	<0.005	0.0016	0
Perfluoropentane sulfonic acid (PFPeS)	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	0.0012	0
Perfluorohexane sulfonic acid (PFHxS)	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	0.0021	0
Perfluoroheptane sulfonic acid (PFHpS)	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
Perfluorooctane sulfonic acid (PFOS)	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
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	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	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	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	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	<0.0002	0	<0.005	<0.005	0	<0.005	<0.0002	0
Perfluorooctanoic acid (PFOA)	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
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	<0.005	<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	0.0021	0
Sum of US EPA PFAS (PFOS + PFOA)*	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	-	-
PFAS (Sum of Total)	mg/kg	0.0002	<0.05	<0.05	0	<0.05	<0.0002	0	<0.05	<0.05	0	<0.05	<0.0002	0	<0.05	<0.05	0	<0.05	0.0049	0
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	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	-	-
PFAS (Sum of Total)(WA DER List)	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	0.0037	0
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	-	-

***RPDs have only been considered where a concentration is greater than 10 times the EQL.**
****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 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.**

		Lab Report Number	1013592			1013592	EM2314118	
		Field ID	MW02	QC01A		MW02	QC01B	
		Location Code	MW02	MW02		MW02	MW02	
		Matrix Type	Water	Water		Water	Water	
		Date	03 Aug 2023	03 Aug 2023		03 Aug 2023	03 Aug 2023	
		Sample Type	Normal	Field_D	RPD	Normal	Interlab_D	RPD
	Unit	EQL						
Inorganics								
Total Dissolved Solids	mg/L	10	3,800	-	-	3,800	-	-
Acidity & Alkalinity								
Alkalinity (Carbonate as CaCO3)	mg/L	10	<10	-	-	<10	-	-
Alkalinity (Bicarbonate as CaCO3)	mg/L	20	1,100	-	-	1,100	-	-
Alkalinity (Hydroxide as CaCO3)	mg/L	20	<20	-	-	<20	-	-
Alkalinity (total as CaCO3)	mg/L	20	1,100	-	-	1,100	-	-
Major Ions								
Calcium	mg/L	0.5	58	-	-	58	-	-
Magnesium	mg/L	0.5	170	-	-	170	-	-
Potassium	mg/L	0.5	23	-	-	23	-	-
Sodium	mg/L	0.5	1,900	-	-	1,900	-	-
Chloride	mg/L	1	2,200	-	-	2,200	-	-
Fluoride	mg/L	0.5	<0.5	-	-	<0.5	-	-
PFAS - Perfluoroalkyl Sulfonic Acids								
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01	11	12	9	11	-	-
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	26	26	0	26	30.7	17
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	30	30	0	30	15.6	**63**
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	170	160	6	170	169	1
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	8.6	8.7	1	8.6	5.92	**37**
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	30	35	15	30	22.0	**31**
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.01	<0.01	0.03	-	<0.01	<0.10	0
PFAS - Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	µg/L	0.05	4.3	5.1	17	4.3	4.13	4
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	10	10	0	10	8.83	12
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	38	39	3	38	46.9	21
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	3.8	4.6	19	3.8	4.58	19
Perfluorooctanoic acid (PFOA)	µg/L	0.01	8.7	11	23	8.7	8.60	1
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.10	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.10	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.10	0
Perfluorododecanoic acid (PFDoDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.10	0
Perfluorotridecanoic acid (PFTrDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.10	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.25	0
PFAS - Perfluoroalkyl Sulfonamide								
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.10	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.25	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.25	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.10	0
N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.25	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.25	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.10	0
PFAS - Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.10	0
6:2 Fluorotelomer Sulfonate (6:2 FTS)	µg/L	0.05	0.82	0.88	7	0.82	0.94	14
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.10	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.10	0
PFAS - Sums								
Sum of PFHxS and PFOS	µg/L	0.01	200	195	3	200	191	5
Sum of US EPA PFAS (PFOS + PFOA)*	µg/L	0.01	38.7	46	17	38.7	-	-
PFAS (Sum of Total)	µg/L	0.01	341.22	342.46	0	341.22	317	7
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	µg/L	0.01	208.7	206	1	208.7	-	-
PFAS (Sum of Total)(WA DER List)	µg/L	0.01	291.62	291.58	0	291.62	296	1
PFAS								
Perfluorononane sulfonate (PFNS)	µg/L	0.01	<0.01	0.15	-	<0.01	-	-

***RPDs have only been considered where a concentration is greater than 10 times the EQL.**

****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 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.**

		Lab Report Number	1026487			1026487	EM2316765	
		Field ID	MW02	FD01		MW02	FS01	
		Location Code	MW02	MW02		MW02	MW02	
		Matrix Type	Water	Water		Water	Water	
		Date	14 Sep 2023	14 Sep 2023		14 Sep 2023	14 Sep 2023	
		Sample Type	Normal	Field_D	RPD	Normal	Interlab_D	RPD
	Unit	EQL						
Inorganics								
Total Dissolved Solids	mg/L	10	4,100	-	-	4,100	-	-
Acidity & Alkalinity								
Alkalinity (Carbonate as CaCO3)	mg/L	10	96	-	-	96	-	-
Alkalinity (Bicarbonate as CaCO3)	mg/L	20	1,400	-	-	1,400	-	-
Alkalinity (Hydroxide as CaCO3)	mg/L	20	<20	-	-	<20	-	-
Alkalinity (total as CaCO3)	mg/L	20	1,500	-	-	1,500	-	-
Major Ions								
Calcium	mg/L	0.5	48	-	-	48	-	-
Magnesium	mg/L	0.5	150	-	-	150	-	-
Potassium	mg/L	0.5	22	-	-	22	-	-
Sodium	mg/L	0.5	1,800	-	-	1,800	-	-
Chloride	mg/L	1	1,800	-	-	1,800	-	-
Fluoride	mg/L	0.5	<0.5	-	-	<0.5	-	-
PFAS - Perfluoroalkyl Sulfonic Acids								
Perfluoropropanesulfonic acid (PFPrS)	µg/L	0.01	5.2	6.1	16	5.2	-	-
Perfluorobutane sulfonic acid (PFBS)	µg/L	0.01	11	13	17	11	12.8	15
Perfluoropentane sulfonic acid (PFPeS)	µg/L	0.01	10	12	18	10	13.8	**32**
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	83	96	15	83	95.7	14
Perfluoroheptane sulfonic acid (PFHpS)	µg/L	0.01	6.2	7.9	24	6.2	9.45	**42**
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	26	32	21	26	26.2	1
Perfluorodecanesulfonic acid (PFDS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0
PFAS - Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	µg/L	0.05	2.2	2.6	17	2.2	2.64	18
Perfluoropentanoic acid (PFPeA)	µg/L	0.01	4.6	5.4	16	4.6	5.79	23
Perfluorohexanoic acid (PFHxA)	µg/L	0.01	21	25	17	21	23.2	10
Perfluoroheptanoic acid (PFHpA)	µg/L	0.01	1.9	2.1	10	1.9	2.24	16
Perfluorooctanoic acid (PFOA)	µg/L	0.01	5.5	6.5	17	5.5	5.83	6
Perfluorononanoic acid (PFNA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0
Perfluorodecanoic acid (PFDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0
Perfluoroundecanoic acid (PFUnDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	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	<0.05	0
Perfluorotetradecanoic acid (PFTeDA)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.12	0
PFAS - Perfluoroalkyl Sulfonamide								
Perfluorooctane sulfonamide (FOSA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.12	0
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.12	0
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.05	0
N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.12	0
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	µg/L	0.05	<0.05	<0.05	0	<0.05	<0.12	0
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	µg/L	0.02	<0.05	<0.05	0	<0.05	<0.05	0
PFAS - Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0
6:2 Fluorotelomer Sulfonate (6:2 FTS)	µg/L	0.05	0.19	0.25	27	0.19	0.25	27
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	µg/L	0.01	<0.01	<0.01	0	<0.01	<0.05	0
PFAS - Sums								
Sum of PFHxS and PFOS	µg/L	0.01	109	128	16	109	122	11
Sum of US EPA PFAS (PFOS + PFOA)*	µg/L	0.01	31.5	38.5	20	31.5	-	-
PFAS (Sum of Total)	µg/L	0.01	176.79	208.89	17	176.79	198	11
Sum of enHealth PFAS (PFHxS + PFOS + PFOA)*	µg/L	0.01	114.5	134.5	16	114.5	-	-
PFAS (Sum of Total)(WA DER List)	µg/L	0.01	155.39	182.85	16	155.39	175	12
PFAS								
Perfluorononane sulfonate (PFNS)	µg/L	0.01	<0.06	0.04	0	<0.06	-	-

***RPDs have only been considered where a concentration is greater than 10 times the EQL.**

****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 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.**

Lab Report Number			1009731		1013592			1020822				1024020		1026487	
Field ID			RB01	RB02	FB01	RB04	TB01	RB01A	RB01B	RB02A	RB03A	RINSATE01	RINSATE02	FB01	RB01
Matrix Type			Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Date			18 Jul 2023	19 Jul 2023	03 Aug 2023	03 Aug 2023	03 Aug 2023	23 Aug 2023	23 Aug 2023	24 Aug 2023	25 Aug 2023	05 Sep 2023	05 Sep 2023	14 Sep 2023	14 Sep 2023
	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	<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	<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	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorohexane sulfonic acid (PFHxS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<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	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctane sulfonic acid (PFOS)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<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	<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	<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	<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	<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	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic acid (PFOA)	µg/L	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<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	<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	<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	<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	<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	<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	<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	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Methyl perfluorooctane sulfonamide (MeFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	µg/L	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<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	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01



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