ACT MATERIALS RECOVERY FACILITY

ADDENDUM TO APPENDIX J TARGETED SITE INVESTIGATION

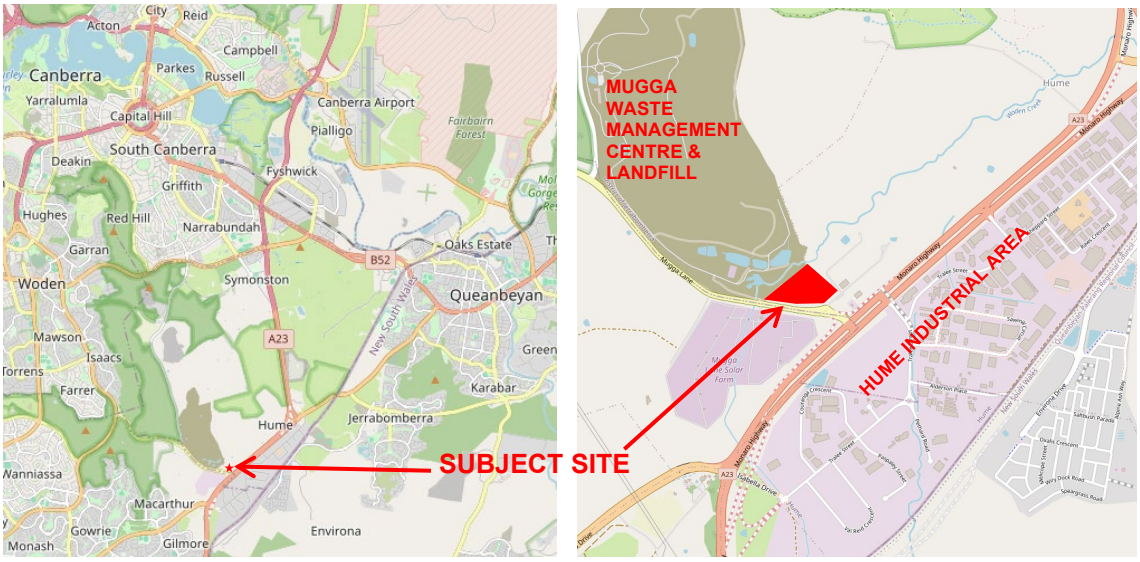
Prepared for Veolia Environmental Services (Australia) Pty Ltd | 2 April 2025

Introduction

This report is prepared as an Addendum to *Appendix J – Targeted Site Investigation* prepared by GHD for ACT NoWaste in 2023 and submitted with a draft EIS for a new Materials Recovery Facility (MRF) on Block 12 Section 25 Hume, refer Figure 1.

Since that time ACT NoWaste has passed the responsibility to finalise the EIS to Veolia. GHD are not in a position to complete the EIS and as such, Veolia has engaged Element Environment to undertake this work.

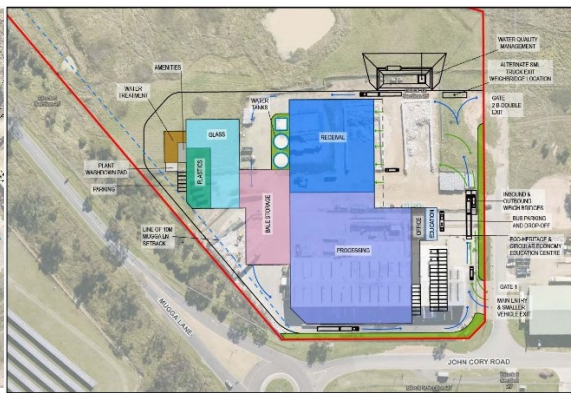
Figure 1: Site Location



Veolia has made changes to the proposed site layout and design of the MRF to achieve operational efficiencies (refer Figure 2 & 3).

Figure 2: Veolia Revised Site Plan

Figure 3: GHD Concept Plan



The GHD *Appendix J – Targeted Site Investigation* covered the area of the existing MRF including the external storage areas currently utilised as an open waste transfer facility.

ACT Agency Review

The Office of the Environment Protection Authority (OEPA) reviewed the GHD report and provided the following comments:

1. The correct version of the Territory Plan should be referenced in the report. If you are unsure which Territory Plan is applicable to the development, you can contact the EPSDD for advice.
2. The report only identifies two APECs, namely open earth bale storage area and dam. Sufficient justification must be provided as to why the existing MRF area is not considered an APEC.
3. In accordance with ACT EPA Information Sheet 11, consideration should be given to the site's suitability for all land uses permitted by its zoning and preferably list all suitable uses in the report.
4. Only six judgemental sampling locations were chosen for the TSI. Sufficient justification must be provided to demonstrate that six sampling locations are appropriate to support the investigation.
5. The TSI found BH02 had a very strong landfill odour. In accordance with the NEPM, highly malodorous soils or extracted groundwater is an example of where site assessment may not have detected contamination above investigation or screening levels but where further assessment would be required. Sufficient justification must be provided as to why further investigation into the area is not warrant and whether odour management measures are needed to protect onsite receptors.

The following responses are provided to the above OEPA comments:

Territory Plan

At the time of preparation of the July 2023 GHD Report, the applicable Territory Plan was the 2008 version. Since that time the Territory Plan 2023 has come into effect. Under the 2023 Territory Plan the land retains is IZ1 General Industrial zoning.

APECs

The 'Areas of Potential Environmental Concerns' (APECs) were identified based on review of historical aerial photography, information from the Lotsearch reports, information provided by the EPA, publicly available resources and site walkover on 15 March 2023.

The APECs were initially identified in the GHD *Preliminary Site Investigation* dated 4 April 2023. The two APECs are:

- 1. Open earth bale storage area: Given the area is not undercover, rainwater may flow into the bales and onto the soil.
- 2. Dam: The runoff from the southern portion of the proposal site is expected to have been flowing towards the dam since operation of the facility.

Subsequent to the Preliminary Site Investigation GHD prepared a *Sampling Analysis and Quality Plan* (SAQP) dated 16 June 2023 to guide further targeted site investigations.

The existing MRF building was not identified as an APEC due to the operations being fully enclosed within the building set on a concrete slab. Any material escaping from the confines of the building would end up in the open storage area, which was identified as an APEC.

Land Uses

The site is zoned IZ1 General Industrial under Territory Plan 2023. The range of permitted uses, which includes land uses as well as development types, include:

- Ancillary use
- Animal care facility
- Bulk landscape supplies
- Car park
- Caretaker's residence
- Communications facility
- Community activity centre
- Community theatre
- Complementary use
- Consolidation
- Craft workshop
- Cultural facility
- Data centre
- Defence installation
- Demolition
- Distribution reservoir
- Drone facility
- Educational establishment
- Emergency services facility
- Freight transport facility
- General industry
- Hazardous industry
- Hazardous waste facility
- Health facility
- Hospital
- Incineration facility
- Indoor recreation facility
- Industrial trades
- Light industry
- Light rail
- Liquid fuel depot
- Major road
- Major electricity storage facility
- Major electrical sub-station
- Major gross pollutant trap
- Major pump station
- Major service conduits
- Minor road
- Minor use
- Municipal depot
- Offensive industry
- Parkland
- Pedestrian plaza
- Place of worship
- Power generation station
- Railway use
- Recyclable materials collection
- Recycling facility
- Religious associated use
- Scientific research establishment
- Service station
- Sign
- Storage facility
- Subdivision
- Temporary use
- Transport facility
- Treatment plant
- Urban lake, pond and/or retardation basin
- Utility hydrogen production facility
- Varying a lease, except where prohibited
- Veterinary clinic
- Water storage dam
- Warehouse
- Waste transfer station

The above list covers a wide range of uses. The Targeted Site Investigation (TSI) was undertaken specifically to consider the suitability of the site for a MRF.

The key findings of the TSI confirmed that concentrations of heavy metals, BTEX and TRH and COPCs in analysed soil samples were below adopted health screening criteria. In addition, Asbestos was not detected in any of analysed soil samples and no suspected ACM was encountered at ground surface and surrounding sampling locations.

The TSI concluded that the potential contamination risk to construction or future operation workers is low. The operation of a MRF for 10 hours each day is similar to many other industrial activities that are located within industrial estates. As such, it is appropriate to consider that any other permitted use that operates for a similar timeframe to the proposed MRF would be a suitable use.

To err on the side of caution, without further site investigations being undertaken, it is suggested that permitted uses that involve continuous occupation be considered unsuitable. Based on the permitted uses in the IZ1 zone this would include:

Animal care facility	Emergency services facility
Caretaker's residence	Health facility
Community theatre	Hospital
Cultural facility	Religious associated use
Defence installation	Scientific research establishment
Educational establishment *	

* Where residential accommodation is involved

Sampling Locations

The GHD *Preliminary Site Investigation* included previous land use assessment back to 1944 to demonstrate that the site was vacant (broadacre grazing) until the original MRF was constructed in 2004. The APEC subject to the additional sampling under the *Targeted Site Investigation* has an approximate area of 9,500m^2 (based on ACTMAPi data).

The NSW EPA *Contaminated Sites: Sampling Design Guidelines* (2022) was used to inform the GHD *Sampling Analysis and Quality Plan* (SAQP) dated 16 June 2023 which guided the further targeted site investigations. The NSW sampling guidelines suggest 20 soil samples for an area of 9,500m^2. However, it also suggests the samples are taken up to a depth of 100-150mm. This is based on ensuring that contamination near the surface is identified as a result of previous land uses.

The depth of the samples taken from the boreholes within the identified APEC was up to 3m. This ensured that potential contaminants from fill material brought into the site to create the base for the storage area established when the site stopped processing recyclable materials and commenced 'waste transfer' operations (i.e. sorting, baling, storing and dispatch, after the 2022 fire), together with original natural soil material could be assessed.

The consistent site coverage due to the surface established to accommodate additional storage, the short time period this area has been used, lack of any previous land use, plus the significant depth of the bores drilled for the samples, enabled the sampling regime to produce results with a high level of confidence equivalent to an increased number of samples at shallower depths.

Odour

Borehole 2 was an additional borehole located outside the initial APEC. It is located immediately adjacent to a low bund earth mound installed to contain site runoff from the immediately adjacent paved area that was used for depositing recyclable material after most of the original MRF building could not be used after the fire. Borehole 2 is remote from the other boreholes and was the only site where odour was encountered. The GHD TSI concluded that the odour was likely due to the existing MRF and the landfill to the north and not linked to the soil samples.

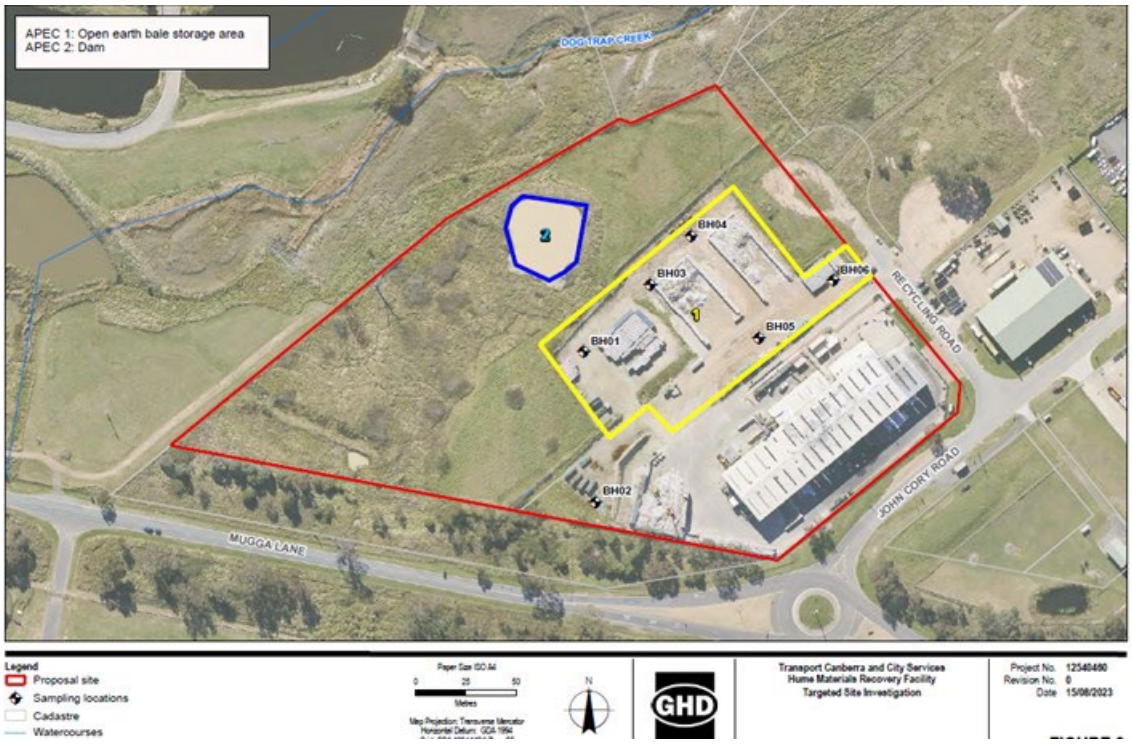
The proposed Veolia site layout, refer Figure 2, shows that the location of borehole 2 will be entirely under a concrete slab with no potential to impact on-site receptors.

Assessment against revised Veolia site layout

Figure 4 shows the location of boreholes used to inform the TSI. This shows that boreholes 1, 3 and 4 are at the western edge of the site area to be occupied by the revised Veolia design. Based

on the minor change to the site layout it is not considered that additional investigations are necessary to assess the revised Veolia design.

Figure 4: Sampling Areas



The key findings of the GHD TSI remain applicable to the revised proposal and, as such, the recommendations, which are repeated below, remain relevant for the Veolia MRF development proposal.

- Hazardous building material survey should be undertaken prior to demolishing the existing MRF.
- Construction environmental management plan (CEMP) should be prepared and include a Contamination Management Plan including an unexpected contamination finds procedure prior to the commencement of construction work.
- Any soil removed from the site during the proposed development should be classified in accordance with ACT EPA Waste Classification Guidelines (2021) and disposed of at a suitable licensed waste facility.
- Given the relative shallow groundwater levels, groundwater investigation should be considered if the construction works will interfere with groundwater.

Conclusions

The GHD Targeted Site Investigation concluded that “The potential contamination risk to construction or future operation workers of the proposal site is considered low” and it is considered that this conclusion remains relevant to the revised site layout proposed by Veolia.

Hume Materials Recovery Facility

Targeted site investigation

Transport Canberra and City Services

25 July 2023

→ **The Power of Commitment**

Project name		FOGO and MRF Project Delivery Services					
Document title		Hume Materials Recovery Facility | Targeted site investigation					
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Executive Summary

Background

The ACT Government is proposing to replace and upgrade the existing Material Recovery Facility (MRF) on Block 12, Section 25 Hume, ACT (the proposal site).

The proposal would be designed to process up to 115,000 tonnes per year of mixed recyclables. The proposed capacity would provide for population growth and changing consumer behaviours which are expected to contribute to increases in recoverable materials over time.

Objective

The objective of the targeted site investigation (TSI) is to collect soil contamination data from the proposal site to assess the potential contamination risk to human health in aim to support concept design and planning approval.

Scope of work

The scope of this TSI included:

– Health, safety and environment documentation.
– Boreholes at six locations to a target depth of 3.0 metres.
– Laboratory analysis of the contaminants of potential concern (COPC) for soil.
– Review of surface water certificate of analysis.
– Preparation of details and outcomes of the TSI investigation (this report).

This TSI only covers soil contamination investigation outlined in the SAQP (GHD, 2023a).

Key findings

Key findings of the TSI include:

– The soil profile at the boreholes comprised of fill followed by natural residual soil. The fill predominantly comprised of clayey sand with a thickness between 0.1 and 0.6 metres, with some crushed glass. The residual soil consisting of grey, brown to tan or mottled orange sandy clay or clayey sands.
– Groundwater was encountered at 2.6 m bgl at BH01 and 2.5 m bgl at BH02.
– No visual or olfactory evidence of contamination were encountered during the soil sampling. The landfill odour was likely due to the existing MRF and the landfill to the north and not linked to the soil samples.
– No suspected ACM was encountered at ground surface and surrounding sampling locations.
– Asbestos was not detected in any of analysed soil samples.
– Concentrations of COPCs in analysed soil samples were below adopted health screening criteria.
– Concentrations of heavy metals, BTEX and TRH in dam water sample (sampled by client in 2020) were below adopted health screening criteria (direct contact pathway).
– Concentrations of heavy metals, BTEX and TRH in dam water sample were reported below the adopted ecological criteria within exception of copper. Copper concentration was reported at 0.004 mg/L exceeded the criterion of 0.0018 mg/L.

Conclusions

Subject to the objectives in Section 1.1 and limitations in Section 1.4, the following conclusions are made based on the findings of the TSI:

– The potential contamination risk to construction or future operation workers of the proposal site is considered low.

Recommendations

GHD recommend:

– Hazardous building material survey should be undertaken prior to demolishing the existing MRF.
– Construction environmental management plan (CEMP) should be prepared and include a Contamination Management Plan including an unexpected contamination finds procedure prior to the commencement of construction work.
– Any soil removed from the site during the proposed development should be classified in accordance with ACT EPA Waste Classification Guidelines (2021) and disposed of at a suitable licensed waste facility.
– Given the relative shallow groundwater levels, groundwater investigation should be considered if the construction works will interfere with groundwater.

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Appendices

1. Introduction

The ACT Government is proposing to replace and upgrade the existing Material Recovery Facility (MRF) on Block 12, Section 25 Hume, ACT (the proposal site). The proposal site is located to the north of the Monaro Highway in an industrial and rural area located approximately 12.5 km south of Canberra City (refer to Figure A.1 of Appendix A). The existing MRF was extensively damaged in a fire on 26 December 2022 and the facility is non-operational. The main shed remains standing and is currently being used as a waste transfer station to accept recyclables, sort, and store materials before being shipped to other processing facilities.

The proposal would replace the existing MRF and provide technological improvements to facilitate greater resource recovery by both increasing the quality of recycled materials and by reducing the amount of nonrecyclable residual waste generated that is currently sent to landfill. The new Hume MRF would be one of the first advanced facilities in Australia to enable separation mixed plastics. Upgraded technology would also improve the quality and therefore marketability of paper and mixed cardboard, mixed plastics and glass that would be received from the ACT and five regional NSW councils.

The proposal would be designed to process up to 115,000 tonnes per year of mixed recyclables. The proposed capacity would provide for population growth and changing consumer behaviours which are expected to contribute to increases in recoverable materials over time.

Key features of the proposal include:

– Replacement of the existing MRF.
– Additional warehouse style facilities.
– Civil works and piling to support the dynamic loads imposed by rotating and high frequency vibrating equipment.
– Expansion of hardstand space towards the west of the proposal site.
– A trade waste system to capture contaminated stormwater runoff.

1.1 Objective

The objective of the targeted site investigation (TSI) is to collect soil contamination data from the proposal site to assess the potential contamination risk to human health in aim to support concept design and planning approval.

1.2 Purpose

The purpose of this TSI is to document the outcomes of the investigation detailed in the sampling analysis and quality plan (SAQP) (GHD, 2023a).

1.3 Scope of work

The scope of this TSI is as follows:

– Health, safety and environment documentation.
– Boreholes at six locations to a target depth of 3.0 metres.
– Laboratory analysis of the contaminants of potential concern (COPC) for soil.
– Review of surface water certificate of analysis obtained from the client.
– Preparation of details and outcomes of the TSI investigation (this report).

This TSI only covers soil contamination investigation outlined in the SAQP (GHD, 2023a). The proposal site location is shown in Figure A.1 of Appendix A.

1.4 Limitations

This report has been prepared by GHD for Transport Canberra and City Services and may only be used and relied on by Transport Canberra and City Services for the purpose agreed between GHD and Transport Canberra and City Services as set out in Section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than Transport Canberra and City Services 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.
– information obtained from, and testing undertaken at or in connection with, specific sample points.
– assumptions made by GHD described in this 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.

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, existing concrete slabs, services and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

2. Environmental setting

Information provided in the following section has been obtained from the preliminary site investigation (PSI) (GHD, 2023b).

2.1 Site identification

A summary of the site information is provided in Table 2.1.

Table 2.1 Site information summary

Address	1 John Cory Circuit, Hume ACT 2620
Block and Section	Hume: Block 12, Section 25
Current Land Use	Southern portion: waste transfer including storage of glass and cardboard/paper and baling of plastics. Northern portion: vacant.
Size (m^2)	50,619 (Reference source: https://actmapi.act.gov.au)
Land Zoning	IZ1: General Industry
Immediate Surrounds	– North: Dog Trap Creek, Mugga Landfill leachate and surface water management ponds and landfill site. – South: Mugga Lane and Mugga Lane Solar Park – East: ACT Skip Hire, Recycling Road and proposed food organics and garden organics (FOGO) facility site – West: Vacant land and drainage areas alongside Mugga Lane
Broad description of location	– The site is located to the north of the Monaro Highway in an industrial and rural area located approximately 12.5 km south of Canberra City. – West of the site is Mugga Lane landfill which includes a number of surface water and leachate management dams. – South of the site is Mugga Lane Solar Park and ACT Skip Hire and Soft Landing Mattress Recycling – The site has previously been utilised as a materials recycling facility with recycled material treated and stored at the site.

2.2 Environmental setting

The environmental setting is summarised in Table 2.2.

Table 2.2 Environmental setting

Information	Details
Topography	The site area varies between 612 – 617 metres (m) Australia Height Datum (AHD), according to topographic data from the Environmental Protection and Sustainable Development Directorate (EPSDD). The regional topography is mostly flat in the southern area with a slight fall from south to north. The western grassy area has a small dip of roughly three metres though this was difficult to discern during the site visit.
Soils and landscapes	According to the Atlas of Australian Soils (CSIRO, 2011) the site is within the Williamsdale Landscape. This unit is characterised by Kandosols which are associated with yellow leached earths in intermediate drainage areas and hard neutral and/or alkaline yellow mottled soils in poorly drained areas. Within the one-kilometre site buffer the Disturbed Terrain Landscape is present in the north-west area and the Burra landscape in the northern buffer. Sodosol soils are present in the western area of the report buffer. According to the Atlas of Australian Acid Sulfate Soils the acid sulphate soils class in the site area is Class C and the works would have an extremely low probability of encountering acid sulphate containing soils (CSIRO, 2011). Approximately 400 m west

Information	Details
	of the site the soils are Class B soils are present and has a low probability of encountering acid sulphate containing soils.
Hydrology	Surface water is expected to follow the local topography and generally flow northwards. There is a small dam located northern portion of the site, between the creek and the current MRF. Run-off from the site is expected to flow towards this dam and towards Dog Trap Creek based on natural topography. Drainage from Mugga Lane flows into the site via a culvert in the western edge of the site. This area was observed to be waterlogged. Drainage from this area flows towards the small dam or towards Dog Trap Creek. There is a natural creek, Dog Trap Creek, located to the north of the site (the closest point being approximately 35 metres) which is a tributary of Jerrabomberra creek and flows from west to east. It is expected that surface water flows from the site, and the small dam, flows into Dog Trap Creek and then branches off into small drainage networks in Gilmore Paddocks. This system is part of the Jerrabomberra Creek Catchment.
Geology	The 1:250,000 scale geological structures map (NSW Department of Industry, Resources & Energy, 2014) indicated the site is situated on Silurian aged Deakin Volcanics – Rhyodacitic ignimbrite and minor volcaniclastic and argillaceous sediments.
Hydrogeology	The site and surrounding area located on fractured or fissured, extensive aquifers described to have low to moderate productivity. The site is on Symonston Hydrogeological Landscape (HGL) which is characterised by low land salinity and moderate salt store and mobility. There are no ACT Government boreholes on or near the site.

2.3 Summary of site use history and preliminary conceptual site model

The southern portion of the site has been operational as a MRF for 25 years according to client information. It is now primarily used as a waste transfer station since the fire on the 26 December 2022. Based on the review of site history information, the past site activities (i.e., operational MRF) had the potential for contaminating soil, surface water to the north and/or groundwater.

The northern portion of the site has been vacant land since 1944. The dam has been located on the site since 1994.

Based on the current information, a preliminary conceptual site model (CSM) has been developed during the PSI as presented in Table 2.3. The preliminary CSM shows the source-pathway-receptors linkages identified for the proposal site, COPCs and a discussion on where they are likely to be complete.

Table 2.3 Preliminary CSM developed during PSI.

Sources	COPCs	Pathway	Receptor	Potentially complete
APEC 1: Open earth bale storage area	– Heavy metals (including arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc). – Petroleum hydrocarbons including TRH, BTEX, PAH, Phenols. – PFAS	Direct contact or inhalation with contaminated soil, fill materials or groundwater. Vapour inhalation. Ingestion of soils and dust. Direct contact with groundwater.	Human – Construction workers – Future MRF workers	Likely complete
		Migration of surface water towards down gradient receptors. Migration of groundwater towards down gradient receptors. Discharge of groundwater to surface water bodies.	Ecological – Aquatic ecological receptors – Soils	
APEC 2: Dam	– Heavy metals (including arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc). – OCP – OPP – Petroleum hydrocarbons including TRH, BTEX, PAH, Phenols. – PFAS	Migration of surface water towards down gradient receptors. Migration of groundwater towards down gradient receptors. Discharge of groundwater to surface water bodies.	Ecological – Aquatic ecological receptors – Soils	Likely complete

3. Data quality objectives

A process for establishing data quality objectives for a site investigation has been defined in the NEPM *Guideline on Site Characterisation* (NEPM, 2013). The Data Quality Objective (DQOs) process has been applied to the site investigation, as described below, to ensure that data collection activities are appropriate and achieve the project objectives. The DQO process involves seven steps as follows:

– Step 1: State the problem.
– Step 2: Identify the decision.
– Step 3: Identify inputs to the decision.
– Step 4: Define the study boundaries.
– Step 5: Develop a decision rule.
– Step 6: Specify limits on decision errors.
– Step 7: Optimise the design for obtaining data.

The seven DQO steps for this project are defined in Table 3.1.

Table 3.1 Data quality objectives

Step	Description
Step 1 State the problem	ACT Government are seeking approval for a proposed MRF. The problem is that the potential contamination risks in open earth bale storage area during the proposal and construction works are presently unknown and the following questions need to be answered: – What is the likelihood that soil contamination is present on the proposal site that may be encountered during construction works and future use of the site as a material recovery facility? – If contamination is present, what level of potential risk does it pose to MRF construction workers, future MRF workers?
Step 2 Identify the decision / goal of the study	The decisions are issues that need to be addressed arising from Step 1. These are: – What are potential sources of contamination within the proposal site? – If contamination is present, will the presence of any contamination affect the future use of the site or pose a risk to the identified human receptors? – Do the results of the sampling and analysis indicate potential risk to human health? – Is there a need for further assessment, remediation and/or management? – Does the dam water in the northern portion of the proposal site pose a potential health risk to MRF construction workers and operation workers? – Does the dam water quality in the northern portion of the proposal site have potential impact to nearby surface water body Dog Trap Creek?
Step 3 Identify the information inputs	The inputs to the decision represent the information and data that will be collected as part of the assessment. These include a review of field notes, analytical results and comparison of analytical results with adopted human health and ecological assessment criteria and waste classification guidelines.
Step 4 Define the study boundaries	*Define the spatial boundaries of the decision* The spatial boundary of the TSI is shown in Figure A.1, Appendix A. *Define the temporal boundaries of the decision* Fieldwork for the TSI was undertaken on 3 and 4 July 2023. *Define the scale of decision making* The scale of the decision making is limited to two APECs identified by PSI within the boundaries of the proposal site.
Step 5 Develop decision rules	The key decision rule is - Are contaminants of concern present at concentrations above the adopted assessment criteria? – If no, then potential risks to receptors and potential for migration is considered low. – If yes, further assessment or management of the potential risks to potential receptors may be required.

Step	Description
Step 6 Tolerable limits on decision errors	Data generated must be appropriate to allow decisions to be made with confidence. Specific limits for this assessment have been adopted in accordance with the appropriate guidance.
Step 7 Optimisation data collection process	This step involves identifying the most resource effective assessment design required to satisfy the DQOs. GHD has used specialist personnel with previous experience in contaminated site assessment to cover all aspects of the assessment.

4. Assessment guidelines

The framework for the contamination assessment made herein was developed in accordance with the guidelines by the NSW Environment Protection Authority (EPA) under Section 105 of the *Contaminated Land Management Act 1997*. These guidelines include, but are not limited to the following:

– ACT (2019) *Information Sheet 4- Requirements for the reuse and disposal of contaminated soil in the ACT.*
– ACT (2020) *Information Sheet 11 – EPA Report Submission Requirements.*
– ACT EPA (2021) *Environmental Standards: Assessment and Classification of Liquid and Non-Liquid Wastes.*
– ACT Government (2017) *Contaminated Sites Environment Protection Policy* – EPA December 2017.
– Heads of the EPAs Australia and New Zealand (HEPA) (2020), *PFAS National Environmental Management Plan (NEMP), Version 2.0.*
– NEPC (2013) *National Environmental Protection (Assessment of Site Contamination) Amended Measure (NEPM).*
– NSW EPA (2022) *Contaminated Sites: Sampling Design Guidelines.*
– NHMRC (2011) Australian Drinking Water Guidelines v3.7.
– ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality.

GHD will undertake comparison of soil data against appropriate guidelines for the site. The guideline values will be used to evaluate the potential risk of the contamination to human health and the environment.

4.1 Contaminants of potential concern

As outlined in the PSI (GHD, 2023b) the primary COPC associated with the proposal site are the following:

– Asbestos containing material (ACM)
– Heavy metals (including arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc)
– Total recoverable hydrocarbons (TRH)
– Benzene, toluene, ethylbenzene and xylene (BTEX)
– Polycyclic aromatic hydrocarbons (PAH)
– Chlorinated hydrocarbons (CHC)
– Organochlorine pesticides (OCP)
– Organophosphate pesticides (OPP)
– Polychlorinated biphenyls (PCB)
– Per- and poly- fluoroalkyl substances (PFAS)

4.2 Adopted assessment criteria

Soil investigation levels for all soil locations have been adopted from assessment criteria are presented in Table 4.1 below.

Table 4.1 Adopted soil assessment criteria

Receptor	Guidelines adopted	Assessment criteria	Rationale
Human health	National Environmental Protection Council, *National Environment Protection (Assessment of Site Contamination) Measure (NEPM)* (NEPC, 2013)	Presence / absence	Presence or absence of asbestos is considered appropriate for initial screening of asbestos in soil at the proposal site.
	National Environmental Protection Council, *National Environment Protection (Assessment of Site Contamination) Measure (NEPM)* (NEPC, 2013)	Health screening levels (HSLs)	The NEPM (2013) presents health screening levels (HSLs) for fuel derived petroleum hydrocarbons, which are generic criteria based on a series of reasonably conservative assumptions in order to be protective of human health for a variety of land use types. For the purposes of selecting health-based investigation levels for this study area, industrial/commercial land uses have been adopted. The NEPM (2013) HSL for fuel derived petroleum products are also adopted as initial screening criteria to assess the potential risk to intrusive maintenance workers in construction trenches and excavations. The HSL were selected because they are more stringent than other IMW published values.
		Health investigation levels (HILs)	For non-petroleum hydrocarbons, the NEPM 2013 HILs have been adopted for commercial industrial purposes. The HILs take into account direct contact pathways, including incidental ingestion and dermal contact.
	PFAS National Environmental Management Plan (NEMP) (HEPA , 2020)	Human health screening value, industrial / commercial (mg/kg)	PFAS NEMP includes human health screening criteria for PFAS.
Ecology	National Environmental Protection Council, *National Environment Protection (Assessment of Site Contamination) Measure (NEPM)*	Ecological screening levels (ESLs)	The NEPM (2013) includes EILs for heavy metals and naphthalene and ESLs for petroleum hydrocarbons. The applicability of ESLs and EILs to the investigation area were evaluated. Given that the proposal will be developed to a waste facility with the majority of the proposal site will be hard paved, there are considered to be limited sensitive receptors within the proposal site. The EILs and ESLs have been considered in APEC 2 to understand baseline data of the water. The EILs and ESLs however were not considered relevant to soil given the limited receptors and therefore not been adopted for the soil assessment.
		Ecological investigation levels (EILs)	
	PFAS National Environmental Management Plan (NEMP) (HEPA , 2020)	Ecological indirect exposure (mg/kg)	PFAS NEMP includes ecological screening criteria for PFAS. Given that the proposal site was used as a material recovery facility and will be redeveloped as a material recovery facility there are limited ecological receptors onsite. The ecological indirect exposure criteria. The PFAS ecological indirect exposure criteria however were not considered relevant to soil given the limited receptors and therefore not been adopted for the soil assessment.

Table 4.2 Adopted dam water assessment criteria

Receptor	Guidelines adopted	Assessment criteria	Rationale
Human	Australian Drinking Water Guidelines (ADWG) 2011 v3.7 (NHMRC, 2011)	Recreational	The ADWG (NHMRC, 2011) recreational criteria has been selected to assess the potential health risk in relation to direct contact with dam water during the construction phase or operation phase of the proposal. It is a conservative approach, given that the dam water in the northern portion of the proposal site is not used for recreational purpose. This recreational criterion is based on drinking 200 ml of water per day from recreational contact, NHMRC, (2008).
Ecology	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018)	Freshwater, 90% ecological criteria	The ANZG (2000) guidelines include ecological screening criteria. The 90% species protection level was selected given the proposal site and surrounding area is highly disturbed and considered to have low ecological value with no sensitive receivers nearby.

5. Sampling and analysis plan and methodology

5.1 Sampling locations

Intrusive investigation was undertaken by judgemental sampling on target of identified APECs. Investigation sample locations are shown on Figure A.2 in Appendix A.

Intrusive investigations comprised the drilling of six boreholes to a target depth of 3 metres. A hammer drill was used for the boreholes and all six of the boreholes reached the target depth.

Table 5.1 Soil sampling design

Targeted area	Sampling locations	Sampling location ID	Investigation method
APEC 1	5	BH01 and BH03 to BH06	Borehole
Drainage area (related to surface runoff from APEC1)	1	BH02	Borehole

5.2 Methodology

5.2.1 Borehole drilling

Underground service utility clearance was conducted by Commence Communications on 3 July 2023. Borehole locations were cleared where practicable. Some locations were moved due to bales of plastics being stored in the area.

Borehole drilling and soil sampling was conducted on the 4 July 2023. Following completion of soil sampling, all borehole locations were backfilled with the drilling spoil material, returned to ground level and compacted.

5.2.2 Dam water

The analysis certificate was provided by the client for water samples collected at the dam (APEC 2). The sampling methodology of dam water was not provided to GHD.

5.3 Soil sampling

Soil sampling methodology is summarised in Table 5.2

Table 5.2 Soil sampling methodology

Method	Number of sampling locations	Sampling procedures
Borehole (hammer drill)	6	Soil sampling was conducted at the surface, near surface, and then every metre until the target depth. Three to four samples were collected from each borehole and two were selected for analysis. Soil samples were collected directly from the drilling rig from areas that were not touching the rig. Clean nitrile gloves were worn when collecting samples and between samples to prevent cross-contamination. Boreholes were reinstated with the spoil generated and the ground surface returned to its original state.

The following procedures were applied to soil sampling:

All soil samples were visually inspected, and field observations and subsurface conditions recorded on field lithological logs, including presence of fill materials and any visual or olfactory indications of contamination.

– GHD submitted soil samples to project laboratories for analysis as per the sampling and analysis program provided in Section 5.4.
– Unanalysed samples were retained on-hold by project laboratories for a period of three months in case additional laboratory analysis is required.
– Photographs were taken of the soil and sampling locations (where possible).
– Soil samples were screened for volatiles in the field using a calibrated photo-ionised detector (PID).

5.4 Soil sample laboratory analysis

Collected soil samples were couriered to Eurofins and ALS, which are National Association of Testing Authorities (NATA) accredited laboratories, under standard GHD chain of custody protocols.

Laboratory analysis of soil samples are summarised in Table 5.3

Table 5.3 Laboratory analysis scheme

Method	Number of locations	Primary samples analysed	Analysis
Boreholes	6	12	– Heavy metals (including arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc) – Total recoverable hydrocarbons (TRH) – Benzene, toluene, ethylbenzene and xylene (BTEX)
		6	– Polycyclic aromatic hydrocarbons (PAH) – Chlorinated hydrocarbons (CHC) – Organochlorine pesticides (OCP) – Organophosphate pesticides (OPP) – Polychlorinated biphenyls (PCB) – Per- and poly- fluoroalkyl substances (PFAS)
		4	– Asbestos containing material (ACM)

5.5 Data quality assurance and quality control procedures

The quality assurance/quality control (QA/QC) procedures are based on NEPM (2013), HEPA (2020) PFAS NEMP. QA involves all of the actions, procedures, checks and decisions undertaken to ensure the representativeness and integrity of samples and accuracy and reliability of analytical results (NEPM 2013). QC involves protocols to monitor and measure the effectiveness of QA procedures.

5.5.1 Field QA/QC procedures

5.5.1.1 Field quality assurance procedures

All field work were conducted with reference to the NEPM (2013) and GHD's Standard Field Operating Procedures, which ensures all samples are collected by a set of uniform and systematic methods, as required by GHD's QA system.

Key requirements of these procedures are listed below. Specific requirements for handling PFAS samples to prevent cross-contamination are detailed in HEPA (2020). These requirements will be complied with during sampling:

– **Sampling team:** The sampling team followed the methodologies presented within Section 5.2. All field staff involved in sampling were experienced in their respective fields and considered competent in accordance with GHD's QA system.
– **Sample collection, handling and transport:** Soil samples were collected using new disposable nitrile gloves for each sample. Specific requirements for handling PFAS samples such as not using water-proofed clothing

and having food wrappers on-site, as per the HEPA (2020) guidelines, were adhered to at all times. Samples were placed into laboratory provided Teflon-free sample jars and once collected, will be placed on ice (contained in plastic bags) in insulated containers. Samples were delivered to the laboratory within the recommended holding times for the respective analytes.

– **Sample identification procedures:** Each sample was labelled with the sample location, date, project identification number and sampler's initials. Sample details were entered onto a chain of custody (CoC) form that accompanies each batch of samples to the laboratory.
– **CoC information requirements:** A CoC form was be completed and forwarded to the testing laboratory with each batch of samples (Appendix F).
– **Collection of QC samples:** Field QC samples were collected as detailed in Appendix G.
– **Calibration of field equipment:** Prior to use in the field, all field instruments (i.e. PID) were calibrated by the equipment supplier to optimise the accuracy of the measurements taken (Appendix B).

5.5.1.2 Field quality control sampling

The ASC NEPM (NEPC, 2013) and the PFAS NEMP (HEPA, 2020) outline a recommended approach to QC sampling. The QC samples collected during the investigation are described as follows and their results are included in Appendix G.

– Intra-laboratory duplicate: Intra-laboratory duplicate / blind duplicate samples are used to identify the variation in the analyte concentration between samples from the same sampling point.
– Inter-laboratory duplicate: Inter-laboratory duplicate / split duplicate samples provide an indication of the repeatability of the results between laboratories.
– Field blanks: Field blanks are used to estimate contamination of a sample during the collection procedure. Field blanks are collected by pouring laboratory supplied deionised water into laboratory supplied bottles on-Site.
– Rinsate blanks: Rinsate blank samples are used to estimate the amount of contamination introduced by the re-use of sampling equipment. They are obtained by pouring laboratory supplied deionised water over decontaminated sampling equipment (e.g. hand auger) into laboratory supplied bottles.

Table 5.4 Field QC sampling and analysis program

Sample type	Analysis	Rationale	Acceptance criteria
Inter-laboratory duplicate samples	Metals, BTEXN, TRH, PAH	One duplicate sample for every 20 samples	0-30%
	Standard PFAS suite	One duplicate sample for every 10 samples	
Intra-laboratory duplicate samples	Metals, BTEXN, TRH, PAH	One duplicate sample for every 20 samples	0-30%
	Short PFAS suite	One duplicate sample for every 10 samples	
Field and rinsate blanks	Metals, PAH, PFAS suite	One field blank and one rinsate blank per day per piece of reusable equipment.	<LOR

In the instance that acceptance criteria listed above are not met, further assessment of the data is required to determine the impact that this has on the interpretation of the data.

5.5.1.3 Relative percentage difference calculations

Inter- and Intra-laboratory duplicate samples will be assessed by calculating the relative percentage difference (RPD) between the primary, blind and split samples in accordance with the procedure described in AS 4482.1 – 2005 (Standards Australia 2005). Calculation of RPDs provides a quantitative measure of the accuracy of the analytical results reported.

RPD results will be considered acceptable if they are less than or equal to 30%. The only exception to this is when concentrations within the primary and blind or split sample are less than ten times the laboratory LOR. In this case, a greater RPD value is considered acceptable.

5.5.2 Laboratory QA/QC

5.5.2.1 Laboratory analytical programs

Laboratory methods to be used by the primary and secondary laboratories will be suitable for environmental contaminant analysis and are based on established internationally recognised procedures (refer to Section 5.5.2.2). Each of the laboratories is NATA accredited for the proposed analysis.

5.5.2.2 Laboratory quality control procedures

The following laboratory QC procedures will be used during the investigation.

Table 5.5 Laboratory QC procedures

Laboratory duplicate samples	The analysis of a laboratory derived duplicate sample from the process batch, at a rate equivalent to 1 in 10 samples per analytical batch, or one sample per batch if less than 10 samples are analysed in a batch. A laboratory duplicate provides data on the analytical precision and reproducibility of the analytical results. The permitted ranges for the RPD of laboratory duplicates are dependent on the magnitude of the results in comparison to the level of reporting as shown in Table 5.4.
Method blank samples	The analysis of a sample that is as free as possible of the analytes of interest but has been prepared the same as the samples under investigation. The analysis is to ascertain if laboratory reagents, glassware and other laboratory consumables contribute to the observed concentration of analytes in the process batch. If below the maximum acceptable method blank (20% of the practical quantitation limit), the contribution is subtracted from the gross analytical signal for each analysis before calculating the sample analyte concentration. The method blank should return analyte concentrations as 'not detected'.
Laboratory control samples	The analysis of either a reference material or a control matrix fortified with analytes representative of the analyte class. The purpose of laboratory control spike samples is to monitor method precision and accuracy independent of the sample matrix. Typically, the percentage recovery of the laboratory control spike sample is compared to the dynamic recovery limits based on the statistical analysis of the processed laboratory control spike sample analysis. Recoveries should lie between 70% and 130%.
Matrix spike samples	The analysis of one or more replicate portions of samples from the batch, after fortifying the additional portion(s) with known quantities of the analyte(s) of interest. The percentage recovery of target analyte(s) from matrix spike samples is used to determine the bias of the method in the specific sample matrix. Recoveries should lie between 70% and 130%.
Surrogate spike samples	Surrogate spike samples are samples with known additions of known amounts of compounds, which are similar to the analytes of interests in terms of extractability, recovery through clean-up procedures and response to chromatographic or other measurement. Surrogate compounds may be alkylated or halogenated analogues or structural isomers of analytes of interest. The purpose of surrogate spikes, which are added immediately before the sample extraction step, is to provide a check for every analysis that no gross processing errors have occurred, which could have led to significant analyte loss or faulty calculation. Recoveries should lie between 50% and 150%.
Internal standards	Internal standards are known additions of known amounts of compounds which are not found in real samples, will not interfere with quantification of analytes of interest and may be separately and independently quantified. The purpose of internal standards in instrumental techniques is to provide independent signals, which serve to check the consistency of the analytical step. Internal standards are often used for organic compounds and some inorganic compounds.

Table 5.6 Acceptable laboratory RPD ranges

Magnitude of result	Acceptable RPD range
< 10 x limit of reporting (LOR)	No limits
10 – 20 x LOR	0% - 50%
> 20 x LOR	0% - 20%

5.6 Deviations from SAQP

Deviations from the SAQP are outlined in Table 5.7 below.

Table 5.7 Deviations from SAQP

SAQP	Deviation	Reasoning or details where practical
One field blank	No field blanks were collected.	-
Transport spike	No transport spike	Primary laboratory Eurofins could not provide transport spike at the time of investigation.
Transport blank	No transport blank	Primary laboratory Eurofins could not provide transport blank at the time of investigation.

6. Investigation results

6.1 General ground profile

The ground conditions were relatively homogenous, comprising of fill followed by residual material consisting of grey to tan or mottled orange sandy clay or clayey sands, with gravel and crushed glass intermixed. Majority of sampling locations had imported fill material which is likely associated with levelling the area for storage of recyclables. This is likely from natural sources.

Borelogs for the sampling locations are presented in Appendix C.

Table 6.1 Summary of soil profile

Borehole ID	Depths	Description	Contamination indicators
BH01	Fill: 0.0 – 0.6 metres Residual soil: 0.6 – 3.0 metres	Clayey sand, fill Sandy clay, residual	No staining, no odour
BH02	Fill: 0.0 – 0.8 metres Residual soil: 0.8 – 3.0 metres	Clayey sand, fill Sandy clay, residual	Pale green staining (likely from crushed glass within soil), odour from landfill prevalent in this area
BH03	Fill: 0.0 – 0.1 metres Residual soil: 0.1 – 3.0 metres	Fill surface layer Sandy clay / clayey sand, residual	No staining, no odour
BH04	Fill: 0.0 – 0.1 metres Residual soil: 0.1 – 3.0 metres	Fill surface layer Sandy clay / clayey sand, residual	No staining, no odour
BH05	Fill: 0.0 – 0.1 metres Residual soil: 0.1 – 3.0 metres	Fill surface layer Sandy clay / clayey sand, residual	No staining, no odour
BH06	Fill: 0.0 – 0.1 metres Possible fill: 0.1 – 0.3 metres Residual soil: 0.3 – 3.0 metres	Fill surface layer Clayey sand, fill Sandy clay / clayey sand, residual	No staining, no odour

Groundwater was encountered at 2.6 m bgl at BH01 and 2.5 m bgl at BH02.

6.2 Field observations

No olfactory evidence of contamination was noted in any of the investigation locations during the field work. The surface of the site had stray pieces of scattered rubbish such as soft and hard plastics, crushed aluminium cans and crushed coloured glass. The field visit occurred in a period of light rain and the surface was muddy and has pools of water in vehicle tracks.

The general area had a landfill odour which may be linked to the recyclables which create odour from foods or liquids within them or due to the landfill to the north. BH02 was noted to have a very strong landfill odour, likely due to it being in a drainage area where the odour from the landfill was stronger than other sampling areas.

A calibrated photo ionisation detector (PID) was used to screen soil samples for the presence of volatile organic compounds within each of the soil samples. Samples were placed into a zip lock bag prior to PID readings. Select samples were tested with the PID and readings between 0.3 parts per million (ppm) and 0.4 ppm. The PID calibration sheet was obtained for the program and is included in Appendix B.

6.3 Analytical results

6.3.1 Soil

Analytical results tables of soil samples are included in Appendix D. Laboratory analytical certificates are included in Appendix F.

Assessment of analytical results of analysed soil samples are summarised in Table 6.2.

Table 6.2 Summary of soil laboratory analytical results

COPC	Subsurface soil samples
Asbestos	Not detected.
8 metals suite	Concentrations below the adopted health screening criteria
TRH, BTEX, PAH	Concentrations below laboratory reporting limits and adopted health screening criteria
OC, OP, PCB	Concentrations below laboratory reporting limits and adopted health screening criteria
PFAS	Concentrations below laboratory reporting limits and adopted health screening criteria

In summary, no exceedances of adopted health screening criteria were reported in any of analysed soil samples.

6.3.2 Dam water

TCCS undertook surface water sampling within APEC 2 in September 2020. The analytical certificate is provided in Appendix E and analytical results are summarised in Table 6.3.

There were no reported human health exceedances in the analysed dam water sample.

Copper concentration was reported at 0.004 mg/L, exceeded the adopted ecological screening criterion (0.0018 mg/L). No other exceedance of adopted ecological criteria were encountered.

Table 6.3 Summary of dam water laboratory analytical results

COPC	Surface water samples
8 metals suite	Concentrations below the adopted human health criteria. Copper concentrations above adopted ecological criteria, all other metals below adopted ecological criteria.
TRH, BTEX	Concentrations below adopted human health and ecological criteria.

6.4 QA/QC evaluation

GHD reviewed field soil sampling procedures and results of field and laboratory quality control samples. The quality assurance and quality control (QA/QC) evaluation in relation to soil sampling and analysis is presented in Appendix G.

The evaluation concluded that the overall analytical results are representative of the characteristics of materials sampled and suitable for the purposes of this assessment.

Calibration certificates for the PID are included in Appendix B.

7. Findings, conclusion and recommendations

7.1 Refined conceptual site model

Based on the investigation data, the conceptual site model has been refined and summarised in Table 7.1.

Table 7.1 Refined conceptual site model

Sources	Pathway	Receptor	Pathway potentially complete
APEC 1: Open earth bale storage area	– Direct contact or inhalation with contaminated soil, fill materials or groundwater. – Vapour inhalation. – Ingestion of soils and dust. – Direct contact with groundwater.	MRF Construction workers Future MRF operation workers	Incomplete – no exceedance of the adopted human health screening criteria reported in any of analysed soil samples.
APEC 2: Dam	– Accidental direct contact	MRF construction workers or future operation workers	Incomplete – no exceedance of the adopted recreational criteria reported in reviewed dam water sample.
	– Migration of surface water towards down gradient aquatic ecological receptor i.e., Dog Trap Creek.	Aquatic ecological receptors	Possible – the copper exceedance was

7.2 Key findings of the investigation

Key findings of the TSI include:

– The soil profile at the boreholes comprised of fill followed by natural residual soil. The fill predominantly comprised of clayey sand with a thickness between 0.1 and 0.6 metres, with some crushed glass. The residual soil consisting of grey, brown to tan or mottled orange sandy clay or clayey sands.
– Groundwater was encountered at 2.6 m bgl at BH01 and 2.5 m bgl at BH02.
– No visual or olfactory evidence of contamination were encountered during the soil sampling. The landfill odour was likely due to the existing MRF and the landfill to the north and not linked to the soil samples.
– No suspected ACM was encountered at ground surface and surrounding sampling locations.
– Asbestos was not detected in any of analysed soil samples.
– Concentrations of COPCs in analysed soil samples were below adopted health screening criteria.
– Concentrations of heavy metals, BTEX and TRH in dam water sample (sampled by client in 2020) were below adopted health screening criteria (direct contact pathway).
– Concentrations of heavy metals, BTEX and TRH in dam water sample were reported below the adopted ecological criteria within exception of copper. Copper concentration was reported at 0.004 mg/L exceeded the criterion of 0.0018 mg/L.

7.3 Conclusions

The DQO process described in Section 3 posed questions that were to be resolved regarding the is the likelihood that contamination is present on the proposal site during construction works and future operation of the proposal site, and if contamination is present, the level of potential risk does it pose to the proposal site construction workers or future MRF operation workers.

Findings in relation to investigation and assessment DQOs (step 2) are provided in Table 7 below.

Table 7.2 DQO conclusions

Data quality objectives	Findings of the TSI
What are potential sources of contamination within the proposed MRF?	TSI makes reference to findings of PSI and lists of potential sources of contamination. This is in relation to the sampled locations targeted for this investigation and the dam.
Do the results of the sampling and analysis indicate potential risk to human health?	No exceedance of adopted human health screen criteria in analysed soil samples. No exceedance of adopted recreational criteria in analysed water samples.
If contamination is present, will the presence of any contamination affect the future use of the site or pose a risk to the identified human receptors?	It is considered a low likelihood that onsite soil and to pose an unacceptable health risk to construction workers and future operation works of the proposal site.
Is there a need for further assessment, remediation and/or management?	The risk may be appropriately managed through a construction environmental management plan during construction phase which includes an unexpected finds protocol for contamination.
Dam water	
If contamination is present, will the presence of any contamination affect the future use of the site or pose a risk to the identified human receptors? – Does the dam water in the northern portion of the proposal site pose a potential health risk to MRF construction workers and operation workers?	It is considered a low likelihood that the dam water to pose an unacceptable health risk to construction workers and future operation works of the proposal site.
Does the dam water quality in the northern portion of the proposal site have potential impact to nearby surface water body Dog Trap Creek?	Concentration of copper in dam water sample exceeded the adopted ecological criteria.

Based on responses to DQO questions, it is unlikely that that soil and surface water contamination is present on the proposal site that will pose an unacceptable risk to construction or future operation works of the proposal site.

7.4 Recommendations

Considering the historical land use of the site and surrounding land use including active landfill, and limited scope work of this TSI, GHD recommend:

– Hazardous building material survey should be undertaken prior to demolishing the existing MRF.
– Construction environmental management plan (CEMP) should be prepared and include a Contamination Management Plan including an unexpected contamination finds procedure prior to the commencement of construction work.
– Any soil removed from the site during the proposed development should be classified in accordance with ACT EPA Waste Classification Guidelines (2021) and disposed of at a suitable licensed waste facility.
– Given the relative shallow groundwater levels, groundwater investigation should be considered if the construction works will interfere with groundwater.

8. References

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Appendices

Appendix A

Figures

Legend

- Proposal site
- Cadastre
- Watercourses

Paper Size ISO A4

0 25 50

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

Transport Canberra and City Services
Hume Materials Recovery Facility
Targeted Site Investigation

Project No. **12540460**
Revision No. **0**
Date **15/08/2023**

Proposal Location

FIGURE 1

\\ghdnet\ghd\AU\Canberra\Projects\23\12540460\GIS\Maps\Deliverables\MRF_TSI.aprx
Print date: 15 Aug 2023 - 17:23

Legend

- Proposal site
- Sampling locations
- Cadastre
- Watercourses

Paper Size ISO A4

0 25 50

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 55

N

GHD

Transport Canberra and City Services
Hume Materials Recovery Facility
Targeted Site Investigation

Project No. **12540460**
Revision No. **0**
Date **15/08/2023**

Sampling locations

FIGURE 2

\\ghdnet\ghd\AU\Canberra\Projects\23\12540460\GIS\Maps\Deliverables\MRF_TSI.aprx
Print date: 15 Aug 2023 - 17:24

Appendix B

Field equipment calibration sheet

PID Calibration Certificate

Instrument PhoCheck Tiger
Serial No. T-111106

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
Pump	Operation	✓	
	Filter	✓	
	Flow	✓	
	Valves, Diaphragm	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	PID	✓	10.6 ev
Alarms	Beeper	✓	Low: 50ppm; High: 100ppm; TWA: N/A; STEL: N/A
	Settings	✓	
Software	Version	✓	
Data logger	Operation	✓	
Download	Operation	✓	
Other tests:			

Certificate of Calibration

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

Diffusion mode Aspirated mode

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No		Instrument Reading
PID Lamp		97ppm Isobutylene	NATA	SY532		97.4 ppm

Calibrated by: Jesse Stenroos

Calibration date: 28/06/2023

Next calibration due: 28/07/2023

Appendix C

Test pit and borehole logs

BOREHOLE LOG

ENVIRONMENTAL-SOIL BORE

SOIL BORE BH01

Client Transport Canberra and City Services
Project Hume FOGO and MRF Project Delivery
Project No. 12540460
Site Hume Materials Recovery Facility
Location Recycling Road
Date Drilled 04/07/2023 - 04/07/2023

Drill Co. D&N Geotechnical
Driller Joseph
Rig Type Trailer-mounted drilling rig
Total Depth (m) 3.00
Diameter (mm) 90

Easting 695257.339988
Northing 6080921.296893
Grid Ref GDA2020_MGA_zone_55
Elevation not surveyed
Logged By RS/RA
Checked By RS

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						Clayey SAND, grey, subrounded grain sand, well graded, fine grain clay, low plasticity [FILL]	SM		no odour no staining	
0.2										-0.2
0.4		0.3								-0.4
0.6						Sandy CLAY, grey-brown, fine grain, high plasticity, fine-coarse grain sand, subangular, poorly graded [RESIDUAL]	SM		no odour no staining	-0.6
0.8										-0.8
1										-1
1.2										-1.2
1.4										-1.4
1.6										-1.6
1.8										-1.8
2										-2
2.2										-2.2
2.4										-2.4
2.6				▽		Sandy CLAY, trace gravel, grey-brown, fine grain, medium plasticity, coarse grain sand, subangular, poorly graded [RESIDUAL]	W		no odour no staining, Water at 2.6m	-2.6
2.8										-2.8
3						Termination Depth at: 3.00 m. Target depth achieved.				-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 BH02

Client Transport Canberra and City Services
Project Hume FOGO and MRF Project Delivery
Project No. 12540460
Site Hume Materials Recovery Facility
Location Recycling Road
Date Drilled 04/07/2023 - 04/07/2023

Drill Co. D&N Geotechnical
Driller Joseph
Rig Type Trailer-mounted drilling rig
Total Depth (m) 3.00
Diameter (mm) 90

Easting 695310.735711
Northing 6080979.075847
Grid Ref GDA2020_MGA_zone_55
Elevation not surveyed
Logged By RS/RA
Checked By RS

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						Fill surface layer [FILL]	SM		Strong Landfill odour odour pale green staining, Crushed glass	
0.2						Clayey SAND, grey and brown, medium grain, subangular, well graded, fine grain clay, no plasticity [FILL]	SM		Strong Landfill odour odour no staining, Crushed glass throughout, water table at 1.5	-0.2
0.4		0.3	BH02_0.3-0.5							-0.4
0.6										-0.6
0.8						Sandy CLAY, brown, fine grain medium plasticity clay, medium grain sand [RESIDUAL]	W		Strong Landfill odour odour no staining, Crushed glass throughout, water table at 1.5, increase in water at 2.5	-0.8
1										-1
1.2			BH02_1.2-1.5							-1.2
1.4										-1.4
1.6										-1.6
1.8										-1.8
2										-2
2.2										-2.2
2.4				▽						-2.4
2.6										-2.6
2.8										-2.8
3						Termination Depth at: 3.00 m. Target depth achieved.				-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 BH03

Client Transport Canberra and City Services
Project Hume FOGO and MRF Project Delivery
Project No. 12540460
Site Hume Materials Recovery Facility
Location Recycling Road
Date Drilled 04/07/2023 - 04/07/2023

Drill Co. D&N Geotechnical
Driller Joseph
Rig Type Trailer-mounted drilling rig
Total Depth (m) 3.00
Diameter (mm) 90

Easting 695290.436406
Northing 6080954.782838
Grid Ref GDA2020_MGA_zone_55
Elevation not surveyed
Logged By RS/RA
Checked By RS

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						Fill surface layer [FILL]	SM		no odour no staining	0
0.2						Sandy CLAY, dark brown, fine grain clay, medium plasticity, fine - coarse grain sand, subangular to sub-rounded, poor graded [RESIDUAL]	M		no odour no staining	-0.2
0.4			BH03_0.3-0.5			Sandy CLAY, dark brown, fine grain clay, medium plasticity, fine - coarse grain sand, sub-angled to sub-rounded, poor graded [RESIDUAL]	M		no odour no staining	-0.4
0.6						Sandy CLAY, dark brown, fine grain clay, medium plasticity, fine - coarse grain sand, subangular to sub-rounded, poor graded [RESIDUAL]	W		no odour no staining	-0.6
0.8										-0.8
1		0.4	BH03_1.0-1.2							-1
1.2										-1.2
1.4										-1.4
1.6										-1.6
1.8						Clayey SAND, brown-tan, fine - coarse grain, sub angular, poorly graded fine grain clay, low plasticity, increase in clay towards 3.0 [RESIDUAL]	W		no odour no staining	-1.8
2										-2
2.2										-2.2
2.4										-2.4
2.6										-2.6
2.8										-2.8
3						Termination Depth at: 3.00 m. Target depth achieved.				-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 BH04

Client Transport Canberra and City Services
Project Hume FOGO and MRF Project Delivery
Project No. 12540460
Site Hume Materials Recovery Facility
Location Recycling Road
Date Drilled 04/07/2023 - 04/07/2023

Drill Co. D&N Geotechnical
Driller Joseph
Rig Type Trailer-mounted drilling rig
Total Depth (m) 3.00
Diameter (mm) 90

Easting 695263.218896
Northing 6080846.521674
Grid Ref GDA2020_MGA_zone_55
Elevation not surveyed
Logged By RS/RA
Checked By RS

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)
						Fill surface layer [FILL]	SM		no odour no staining	
0.2						Clayey SAND, grey brown, fine - coarse grain, sub rounded, poorly graded, fine grain clay, low plasticity [FILL]	M		no odour no staining	-0.2
0.4			BH04_0.3-0.5			Clayey SAND, grey brown, fine - coarse grain, sub rounded, poorly graded, fine grain clay, low plasticity [RESIDUAL]	M		no odour no staining	-0.4
0.6										-0.6
0.8		0.4				Sandy CLAY, brown tan, fine grain, high plasticity, fine grain sand, subrounded, poorly graded [RESIDUAL]	SM		no odour no staining	-0.8
1										-1
1.2			BH04_1.2-1.5							-1.2
1.4										-1.4
1.6										-1.6
1.8						Clayey SAND, brown tan, fine -medium grain, sub rounded, poorly graded, fine grain clay, low plasticity [RESIDUAL]	SM		no odour no staining	-1.8
2										-2
2.2										-2.2
2.4										-2.4
2.6						Clayey SAND, orange brown, medium - coarse grain, sub rounded, poorly graded, fine grain clay, low plasticity [RESIDUAL]	SM		no odour no staining	-2.6
2.8										-2.8
3						Termination Depth at: 3.00 m. Target depth achieved.				-3

Notes

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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 Transport Canberra and City Services
Project Hume FOGO and MRF Project Delivery
Project No. 12540460
Site Hume Materials Recovery Facility
Location Recycling Road
Date Drilled 04/07/2023 - 04/07/2023

Drill Co. D&N Geotechnical
Driller Joseph
Rig Type Trailer-mounted drilling rig
Total Depth (m) 3.00
Diameter (mm) 90

Easting 695344.606132
Northing 6080928.469453
Grid Ref GDA2020_MGA_zone_55
Elevation not surveyed
Logged By RS/RA
Checked By RS

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)
						Fill surface layer [FILL]	SM		no odour no staining	
0.2						Clayey SAND, pale orange, fine grain sand, sub angular, sub rounded, poorly graded, fine grain clay, low plasticity [RESIDUAL]	SM		no odour no staining	-0.2
0.4						Sandy CLAY, pale orange, fine grain clay, medium plasticity, fine grain sand, sub rounded [RESIDUAL]	SM		no odour no staining	-0.4
0.6										-0.6
0.8						Clayey SAND, tan, fine grain sand, sub rounded, poorly graded, fine grain clay, no plasticity [RESIDUAL]	SM		no odour no staining	-0.8
1		0.3								-1
1.2										-1.2
1.4						Clayey SAND, grey, fine grain sand, sub rounded, poorly graded, fine grain clay, no plasticity [RESIDUAL]	SM		no odour no staining	-1.4
1.6										-1.6
1.8										-1.8
2						Clayey SAND, tan, medium -coarse grain, sub angular, poorly graded, fine grain clay, no plasticity [RESIDUAL]	SM		no odour no staining	-2
2.2										-2.2
2.4										-2.4
2.6										-2.6
2.8										-2.8
3						Termination Depth at: 3.00 m. Target depth achieved.				-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 BH06

Client Transport Canberra and City Services
Project Hume FOGO and MRF Project Delivery
Project No. 12540460
Site Hume Materials Recovery Facility
Location Recycling Road
Date Drilled 04/07/2023 - 04/07/2023

Drill Co. D&N Geotechnical
Driller Joseph
Rig Type Trailer-mounted drilling rig
Total Depth (m) 3.00
Diameter (mm) 90

Easting 695381.664358
Northing 6080956.761216
Grid Ref GDA2020_MGA_zone_55
Elevation not surveyed
Logged By RS/RA
Checked By RS

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)
						Organic surface layer [FILL]	SM		no odour no staining	
0.2						Clayey SAND, pale orange, fine grain sand, sub angular, sub rounded, poorly graded, fine grain clay, low plasticity [POSSIBLE FILL]	SM		no odour no staining	-0.2
0.4		0.4				Clayey SAND, pale orange-tan, fine - coarse grain sand, sub rounded, poorly graded, no plasticity, fine grained clay [RESIDUAL]	SM		no odour no staining	-0.4
0.6										-0.6
0.8						Clayey SAND, orange brown, fine - coarse grain sand, sub rounded, poorly graded, no plasticity, fine grained clay [RESIDUAL]	SM		no odour no staining	-0.8
1										-1
1.2										-1.2
1.4										-1.4
1.6						Sandy CLAY, brown mottle orange, fine grain clay, low plasticity, fine - coarse grain sand, sub rounded, poorly graded [RESIDUAL]	SM		no odour no staining	-1.6
1.8										-1.8
2										-2
2.2										-2.2
2.4										-2.4
2.6						Clayey SAND, pale orange-tan, fine - coarse grain sand, sub rounded, poorly graded, no plasticity, fine grained clay [RESIDUAL]	SM		no odour no staining	-2.6
2.8										-2.8
3						Termination Depth at: 3.00 m. Target depth achieved.				-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

Appendix D

Soil analytical results

Appendix D
Table D-1
Soil analytical results

Transport Canberra and City Services
MRF
Hume FOGO and MRF Project Delivery

	Inorganics	Asbestos																	Metals								BTEXN									
	Moisture (%)	Asbestos from ACM in Soil	ACM - Comment	Asbestos from FA & AF in Soil	AF - Comment	FA- Comment	Approximate Sample Mass	ACM Mass	Mass AF	Mass Asbestos in ACM	Friable Asbestos (FA & AF) - Mass	Mass Asbestos in FA	Mass asbestos in AF	Mass FA	Organic Fibres - Comment	Respirable Fibres - Comment	Asbestos Reported Result	Synthetic Fibres - Comment	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylene Total	Naphthalene	F1 (C6-C10 minus BTEX)	C6-C10 Fraction
	%	%	-	%	-	-	g	g	g	g	g	g	g	g	-	-	-	-	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	1																		2	0.4	5	5	5	0.1	5	5	0.1	0.1	0.1	0.1	0.2	0.3	0.5	20	20
NEPM 2013 Table 1A(1) HIL D Comm/Ind																			3000[#1]	900	3600[#2]	240000	1500[#3]	730[#4]	6000	400000									
NEPM 2013 Table 1A(3) HSL D Comm/Ind Soil for Vapour Intrusion, Clay																																			
0-1m																											4	NL[#8]	NL[#8]			NL[#8]	NL[#8]	310[#9]	
1-2m																											6	NL[#8]	NL[#8]			NL[#8]	NL[#8]	480[#9]	
2-4m																											9	NL[#8]	NL[#8]			NL[#8]	NL[#8]	NL[#8]	
>4m																											20	NL[#8]	NL[#8]			NL[#8]	NL[#8]	NL[#8]	
NEPM 2013 Table 7 HSL D Comm/Ind Asbestos contamination in soil		0.05		0.001[#10]																															
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)																																			
Location Code	**Sample Date**	**Field ID**	**Depth**																																	
BH01	04-Jul-23	BH01_0.3-0.5	0.3-0.5	9.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	7.7	<0.4	16	<5	18	<0.1	<5	<5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
		BH01_1.2-1.5	1.2-1.5	16	0	ND	0	ND	ND	207	0	0	0	0	0	0	0	1[#3]	1[#2]	1[#1]	ND	<2	<0.4	7.8	<5	7.1	<0.1	<5	11	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
BH02	04-Jul-23	BH02_0.3-0.5	0.3-0.5	10	0	ND	0	ND	ND	450	0	0	0	0	0	0	0	1[#3]	1[#2]	1[#1]	ND	2.6	<0.4	10	<5	11	<0.1	<5	8.8	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
		BH02_1.2-1.5	1.2-1.5	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.3	<0.4	6.9	<5	8.8	<0.1	<5	<5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
BH03	04-Jul-23	BH03_0.3-0.5	0.3-0.5	12	0	ND	0	ND	ND	455	0	0	0	0	0	0	0	1[#3]	1[#2]	1[#1]	ND	3.4	<0.4	8.9	<5	9.5	<0.1	<5	<5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
		BH03_1.0-1.2	1-1.2	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.7	<0.4	11	7.1	11	<0.1	<5	8.4	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
BH04	04-Jul-23	BH04_0.3-0.5	0.3-0.5	8.6	0	ND	0	ND	ND	258	0	0	0	0	0	0	0	1[#3]	1[#2]	1[#1]	ND	3.5	<0.4	12	<5	12	<0.1	<5	5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
		BH04_1.2-1.5	1.2-1.5	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.7	<0.4	7.3	<5	16	<0.1	<5	6.8	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
BH05	04-Jul-23	BH05_0.0-0.1	0-0.1	7.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6	<0.4	22	6.5	22	<0.1	<5	7	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
		BH05_0.3-0.5	0.3-0.5	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.3	<0.4	12	7.1	13	<0.1	5.2	16	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
BH06	04-Jul-23	BH06_0.5-0.8	0.5-0.8	8.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.1	<0.4	12	7.4	16	<0.1	<5	11	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
		BH06_1.0-1.2	1-1.2	8.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.8	<0.4	7.7	<5	9.3	<0.1	<5	11	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
		QC101	0.5-0.8	8.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.2	<0.4	12	7.7	18	<0.1	<5	14	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
Statistical Summary																																				
Number of Results	13	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Number of Detects	13	4	0	4	0	0	4	4	4	4	4	4	4	4	4	4	4	0	12	0	13	5	13	0	1	10	0	0	0	0	0	0	0	0	0
Minimum Concentration	7.3	0	0	0	0	0	207	0	0	0	0	0	0	0	1	1	1	0	<2	<0.4	6.9	<5	7.1	<0.1	<5	<5	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
Minimum Detect	7.3	ND	ND	ND	ND	ND	207	ND	ND	ND	ND	ND	ND	ND	1	1	1	ND	2.6	ND	6.9	6.5	7.1	ND	5.2	5	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	16	0	0	0	0	0	455	0	0	0	0	0	0	0	1	1	1	0	7.7	<0.4	22	7.7	22	<0.1	5.2	16	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<20	<20
Maximum Detect	16	ND	ND	ND	ND	ND	455	ND	ND	ND	ND	ND	ND	ND	1	1	1	ND	7.7	ND	22	7.7	22	ND	5.2	16	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	11	0	0	0	0	0	343	0	0	0	0	0	0	0	1	1	1	0	4.3	0.2	11	4.3	13	0.05	2.7	8.2	0.05	0.05	0.05	0.05	0.1	0.15	0.25	10	10
Median Concentration	10	0	0	0	0	0	354	0	0	0	0	0	0	0	1	1	1	0	4.7	0.2	11	2.5	12	0.05	2.5	8.4	0.05	0.05	0.05	0.05	0.1	0.15	0.25	10	10
Standard Deviation	2.9	0	0	0	0	0	129	0	0	0	0	0	0	0	0	0	0	0	1.7	0	4.1	2.4	4.4	0	0.75	4.4	0	0	0	0	0	0	0	0	0

*A Non-Detect Multiplier of 0.5 has been applied.

Environmental Standards Comments

#1:Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability maybe important and should be considered where appropriate (refer Schedule B7).
#2:In the absence of a guideline value for total chromium, chromium VI value adopted
#3:Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lead model for where 50% bioavailability considered. Site-specific bioavailability should be considered where appropriate.
#4:Elemental mercury: HIL does not address elemental mercury. a site specific assessment should be considered if elemental mercury is present, or suspected to be present.
#5:Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL application should consider presence of carcinogenic PAHs (should meet BaP TEQ HIL) & naphthalene (should meet relevant HSL)
#6:Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP ref Schedule 7) BaP TEQ calc by multiplying the conc of each carc. PAH in sample by its BaP TEF (ref Table 1A(1)) & summing
#7:PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is known, or suspected at a site, a site-specific assessment of exposure to all PCBs (inc dioxin like PCBs) should be undertaken
#8:Not limiting: Derived soil HSL exceeds soil saturation concentration
#9:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fraction.
#10:Only applies where the FA & AF are able to be quantified by gravimetric procedures. Not applicable to free fibres.

Data Comments

		TRH - NEPM 2013					TRH - NEPM 1999					PAHs - standard 16																				
		F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo[b+j]fluoranthene	Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	PAHs (Sum of total) - Lab calc	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ) (half LOR) - Lab Calc	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	Organochlorine pesticides EPAVic	Other organochlorine pesticides EPAVic	4,4'-DDE	a-BHC
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		50	50	100	100	100	20	20	50	50	50	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.1	0.1	0.05	0.05
NEPM 2013 Table 1A(1) HIL D Comm/Ind																											4000[#5]	40[#6]	40[#6]	40[#6]				
NEPM 2013 Table 1A(3) HSL D Comm/Ind Soil for Vapour Intrusion, Clay																																	
0-1m	NL[#8]																																
1-2m	NL[#8]																																
2-4m	NL[#8]																																
>4m	NL[#8]																																
NEPM 2013 Table 7 HSL D Comm/Ind Asbestos contamination in soil																																	
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)																																	
Location Code	**Sample Date**	**Field ID**	**Depth**																														
BH01	04-Jul-23	BH01_0.3-0.5	0.3-0.5	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-
		BH01_1.2-1.5	1.2-1.5	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05
BH02	04-Jul-23	BH02_0.3-0.5	0.3-0.5	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05
		BH02_1.2-1.5	1.2-1.5	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-
BH03	04-Jul-23	BH03_0.3-0.5	0.3-0.5	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05
		BH03_1.0-1.2	1-1.2	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-
BH04	04-Jul-23	BH04_0.3-0.5	0.3-0.5	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05
		BH04_1.2-1.5	1.2-1.5	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-
BH05	04-Jul-23	BH05_0.0-0.1	0-0.1	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-
		BH05_0.3-0.5	0.3-0.5	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05
BH06	04-Jul-23	BH06_0.5-0.8	0.5-0.8	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-
		BH06_1.0-1.2	1-1.2	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05
		QC101	0.5-0.8	<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	-	-	-	-
Statistical Summary																																	
Number of Results		13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	6	6	6	6
Number of Detects		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13	13	0	0	0	0
Minimum Concentration		<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05
Minimum Detect		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6	1.2	ND	ND	ND	ND
Maximum Concentration		<50	<50	<100	<100	<100	<20	<20	<50	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.1	<0.1	<0.05	<0.05
Maximum Detect		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.6	1.2	ND	ND	ND	ND
Average Concentration		25	25	50	50	50	10	10	25	25	25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.6	1.2	0.05	0.05	0.025	0.025
Median Concentration		25	25	50	50	50	10	10	25	25	25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.6	1.2	0.05	0.05	0.025	0.025
Standard Deviation		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*A Non-Detect Multiplier of 0.5 has been applied.

Environmental Standards Comments

#1:Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability m
#2:In the absence of a guideline value for total chromium, chromium VI value a
#3:Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lea
#4:Elemental mercury: HIL does not address elemental mercury. a site specific
#5:Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL ap
#6:Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP re
#7:PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is knowr
#8:Not limiting: Derived soil HSL exceeds soil saturation concentration
#9:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fi
#10:Only applies where the FA & AF are able to be quantified by gravimetric p

Data Comments

	OC Pesticides																																	
	Aldrin	Aldrin + Dieldrin	b-BHC	Chlordane	d-BHC	4,4 DDD	4,4 DDT	DDT+DDE+DDD - Lab Calc	Dieldrin	Endosulfan I (alpha)	Endosulfan II (beta)	Endosulfan Sulfate	Endrin	Endrin aldehyde	Endrin ketone	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Hexachlorobenzene	Methoxychlor	Toxaphene	Tokuthion	Azinphos methyl	Bolstar (Sulprofos)	Chlorfenvinphos	Chlorpyrifos	Chlorpyrifos-methyl	Coumaphos	Demeton-O	Demeton-S	Diazinon	Dichlorvos	Dimethoate
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/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	0.05	0.05	0.05	0.1	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	50	0.05	0.5	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2	0.2	0.2	0.2	0.2
NEPM 2013 Table 1A(1) HIL D Comm/Ind		45		530				3600					100				50		80000	2500	160					2000								
NEPM 2013 Table 1A(3) HSL D Comm/Ind Soil for Vapour Intrusion, Clay																																	
0-1m																																	
1-2m																																	
2-4m																																	
>4m																																	
NEPM 2013 Table 7 HSL D Comm/Ind Asbestos contamination in soil																																	
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)																																	
Location Code	**Sample Date**	**Field ID**	**Depth**																																
BH01	04-Jul-23	BH01_0.3-0.5	0.3-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH01_1.2-1.5	1.2-1.5	<0.05	<0.05	<0.05	<0.1	<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	<0.05	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2
BH02	04-Jul-23	BH02_0.3-0.5	0.3-0.5	<0.05	<0.05	<0.05	<0.1	<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	<0.05	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2
		BH02_1.2-1.5	1.2-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	04-Jul-23	BH03_0.3-0.5	0.3-0.5	<0.05	<0.05	<0.05	<0.1	<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	<0.05	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2
		BH03_1.0-1.2	1-1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	04-Jul-23	BH04_0.3-0.5	0.3-0.5	<0.05	<0.05	<0.05	<0.1	<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	<0.05	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2
		BH04_1.2-1.5	1.2-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05	04-Jul-23	BH05_0.0-0.1	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.3-0.5	0.3-0.5	<0.05	<0.05	<0.05	<0.1	<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	<0.05	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2
BH06	04-Jul-23	BH06_0.5-0.8	0.5-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH06_1.0-1.2	1-1.2	<0.05	<0.05	<0.05	<0.1	<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	<0.05	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2
		QC101	0.5-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Statistical Summary

Number of Results	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.05	<0.05	<0.05	<0.1	<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	<50	<0.05	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.05	<0.05	<0.05	<0.1	<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	<50	<0.05	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.025	0.025	0.025	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	25	0.025	0.25	0.1	0.1	0.1	0.1	0.1	0.1	1	0.1	0.1	0.1	0.1	0.1
Median Concentration	0.025	0.025	0.025	0.05	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	25	0.025	0.25	0.1	0.1	0.1	0.1	0.1	0.1	1	0.1	0.1	0.1	0.1	0.1
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*A Non-Detect Multiplier of 0.5 has been applied.

Environmental Standards Comments

#1:Arsenic: HIL assumes 70% oral bioavailability m
#2:In the absence of a guideline value for total chromium, chromium VI value a
#3:Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lea
#4:Elemental mercury: HIL does not address elemental mercury. a site specific
#5:Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL ap
#6:Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP re
#7:PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is knowr
#8:Not limiting: Derived soil HSL exceeds soil saturation concentration
#9:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fi
#10:Only applies where the FA & AF are able to be quantified by gravimetric p

Data Comments

	OP Pesticides																						Chlorinated Hydrocarbons						PCBs					
	Disulfoton	EPN	Ethion	Ethoprop	Fenitrothion	Fensulfothion	Fenthion	Malathion	Merphos	Methyl parathion	Mevinphos (Phosdrin)	Monocrotophos	Naled (Dibrom)	Omethoate	Parathion	Phorate	Pirimiphos-methyl	Pyrazophos	Ronnel	Terbufos	Trichloronate	Tetrachlorvinphos	1,2,4-trichlorobenzene	1,2-dichlorobenzene	1,4-dichlorobenzene	Benzal Chloride	Benzotrichloride	Hexachlorobutadiene	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
EQL	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	2	0.2	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.5	0.5	0.5	0.05	0.05	0.5	100	100	100	100	100	100
NEPM 2013 Table 1A(1) HIL D Comm/Ind																																		
NEPM 2013 Table 1A(3) HSL D Comm/Ind Soil for Vapour Intrusion, Clay																																		
0-1m																																		
1-2m																																		
2-4m																																		
>4m																																		
NEPM 2013 Table 7 HSL D Comm/Ind Asbestos contamination in soil																																		
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)																																		
Location Code	**Sample Date**	**Field ID**	**Depth**																																	
BH01	04-Jul-23	BH01_0.3-0.5	0.3-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH01_1.2-1.5	1.2-1.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.05	<0.05	<0.5	<100	<100	<100	<100	<100	<100
BH02	04-Jul-23	BH02_0.3-0.5	0.3-0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.05	<0.05	<0.5	<100	<100	<100	<100	<100	<100
		BH02_1.2-1.5	1.2-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	04-Jul-23	BH03_0.3-0.5	0.3-0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.05	<0.05	<0.5	<100	<100	<100	<100	<100	<100
		BH03_1.0-1.2	1-1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	04-Jul-23	BH04_0.3-0.5	0.3-0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.05	<0.05	<0.5	<100	<100	<100	<100	<100	<100
		BH04_1.2-1.5	1.2-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05	04-Jul-23	BH05_0.0-0.1	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.3-0.5	0.3-0.5	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.05	<0.05	<0.5	<100	<100	<100	<100	<100	<100
BH06	04-Jul-23	BH06_0.5-0.8	0.5-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH06_1.0-1.2	1-1.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.05	<0.05	<0.5	<100	<100	<100	<100	<100	<100
		QC101	0.5-0.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Statistical Summary																																			
Number of Results				6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Number of Detects				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration				<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.05	<0.05	<0.5	<100	<100	<100	<100	<100	<100
Minimum Detect				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration				<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<2	<0.2	<2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.5	<0.5	<0.5	<0.05	<0.05	<0.5	<100	<100	<100	<100	<100	<100
Maximum Detect				ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.25	0.25	0.25	0.025	0.025	0.25	50	50	50	50	50	50
Median Concentration				0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	0.1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.25	0.25	0.25	0.025	0.025	0.25	50	50	50	50	50	50
Standard Deviation				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*A Non-Detect Multiplier of 0.5 has been applied.

Environmental Standards Comments

#1:Arsenic: HIL assumes 70% oral bioavailability m
#2:In the absence of a guideline value for total chromium, chromium VI value a
#3:Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lea
#4:Elemental mercury: HIL does not address elemental mercury. a site specific
#5:Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL ap
#6:Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP re
#7:PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is knowr
#8:Not limiting: Derived soil HSL exceeds soil saturation concentration
#9:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fi
#10:Only applies where the FA & AF are able to be quantified by gravimetric p

Data Comments

			SVOCs								VOCs		PFAS - Perfluoroalkyl Sulfonic Acids								PFAS - Perfluoroalkyl Carboxylic Acids									
			Arochlor 1260	PCBs (Total)	1,2,3,4-tetrachlorobenzene	1,2,3,5-Tetrachlorobenzene	1,2,4,5-tetrachlorobenzene	1,3,5-Trichlorobenzene	Benzyl chloride	Hexachlorocyclopentadiene	Hexachloroethane	Pentachlorobenzene	1,2,3-trichlorobenzene	1,3-dichlorobenzene	Perfluoropropanesulfonic acid (PFPrS)	Perfluorobutane sulfonic acid (PFBS)	Perfluoropentane sulfonic acid (PFPeS)	Perfluorohexane sulfonic acid (PFHxS)	Perfluoroheptane sulfonic acid (PFHpS)	Perfluorooctane sulfonic acid (PFOS)	Perfluorononane sulfonate (PFNS)	Perfluorodecanesulfonic acid (PFDS)	Perfluorobutanoic acid (PFBA)	Perfluoropentanoic acid (PFPeA)	Perfluorohexanoic acid (PFHxA)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Perfluoroundecanoic acid (PFUnDA)	Perfluorododecanoic acid (PFDoDA)	Perfluorotridecanoic acid (PFTrDA)
			µg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			100	100	0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5	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	0.005	0.005
NEPM 2013 Table 1A(1) HIL D Comm/Ind				7000[#7]																												
NEPM 2013 Table 1A(3) HSL D Comm/Ind Soil for Vapour Intrusion, Clay																																
0-1m																																
1-2m																																
2-4m																																
>4m																																
NEPM 2013 Table 7 HSL D Comm/Ind Asbestos contamination in soil																																
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)																	20		20								50					
Location Code	**Sample Date**	**Field ID**	**Depth**																													
BH01	04-Jul-23	BH01_0.3-0.5	0.3-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH01_1.2-1.5	1.2-1.5	<100	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<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	<0.005	<0.005
BH02	04-Jul-23	BH02_0.3-0.5	0.3-0.5	<100	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<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	<0.005	<0.005
		BH02_1.2-1.5	1.2-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	04-Jul-23	BH03_0.3-0.5	0.3-0.5	<100	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<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	<0.005	<0.005
		BH03_1.0-1.2	1-1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	04-Jul-23	BH04_0.3-0.5	0.3-0.5	<100	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<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	<0.005	<0.005
		BH04_1.2-1.5	1.2-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05	04-Jul-23	BH05_0.0-0.1	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.3-0.5	0.3-0.5	<100	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<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	<0.005	<0.005
BH06	04-Jul-23	BH06_0.5-0.8	0.5-0.8	-	-	-	-	-	-	-	-	-	-	-	-	<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	<0.005	<0.005
		BH06_1.0-1.2	1-1.2	<100	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		QC101	0.5-0.8	-	-	-	-	-	-	-	-	-	-	-	-	<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	<0.005	<0.005
Statistical Summary																																
Number of Results			6	6	6	6	6	6	6	6	6	6	6	6	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Number of Detects			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration			<100	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<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	<0.005	<0.005
Minimum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration			<100	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<0.5	<0.5	<0.5	<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	<0.005	<0.005
Maximum Detect			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration			50	50	0.25	0.25	0.25	0.25	0.25	0.5	0.25	0.25	0.25	0.25	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Median Concentration			50	50	0.25	0.25	0.25	0.25	0.25	0.5	0.25	0.25	0.25	0.25	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025	0.0025
Standard Deviation			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

*A Non-Detect Multiplier of 0.5 has been applied.

Environmental Standards Comments

#1:Arsenic: HIL assumes 70% oral bioavailability m
#2:In the absence of a guideline value for total chromium, chromium VI value a
#3:Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lea
#4:Elemental mercury: HIL does not address elemental mercury. a site specific
#5:Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL ap
#6:Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP re
#7:PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is knowr
#8:Not limiting: Derived soil HSL exceeds soil saturation concentration
#9:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fi
#10:Only applies where the FA & AF are able to be quantified by gravimetric p

Data Comments

Appendix D
Table D-1
Soil analytical results

		PFAS - Perfluoroalkyl Sulfonamide								PFAS - Fluorotelomer Sulfonic Acids				PFAS - Sums				
	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)	6:2 Fluorotelomer sulfonic acid (4:2 FTS)	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	6:2 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)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.005	0.005	0.005	0.005	0.01	0.005	0.005	0.01	0.005	0.01	0.005	0.005	0.005	0.005	0.05	0.005	0.01
NEPM 2013 Table 1A(1) HIL D Comm/Ind																	
NEPM 2013 Table 1A(3) HSL D Comm/Ind Soil for Vapour Intrusion, Clay																	
0-1m																	
1-2m																	
2-4m																	
>4m																	
NEPM 2013 Table 7 HSL D Comm/Ind Asbestos contamination in soil																	
PFAS NEMP 2.0 2020 Industrial/ commercial (HIL D)													20				
Location Code	**Sample Date**	**Field ID**	**Depth**																
BH01	04-Jul-23	BH01_0.3-0.5	0.3-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH01_1.2-1.5	1.2-1.5	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01
BH02	04-Jul-23	BH02_0.3-0.5	0.3-0.5	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01
		BH02_1.2-1.5	1.2-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	04-Jul-23	BH03_0.3-0.5	0.3-0.5	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01
		BH03_1.0-1.2	1-1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH04	04-Jul-23	BH04_0.3-0.5	0.3-0.5	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01
		BH04_1.2-1.5	1.2-1.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH05	04-Jul-23	BH05_0.0-0.1	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		BH05_0.3-0.5	0.3-0.5	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01
BH06	04-Jul-23	BH06_0.5-0.8	0.5-0.8	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01
		BH06_1.0-1.2	1-1.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		QC101	0.5-0.8	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01

Statistical Summary

Number of Results	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Number of Detects	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Maximum Concentration	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.01	<0.005	<0.01	<0.005	<0.005	<0.005	<0.005	<0.05	<0.005	<0.01	
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Average Concentration	0.0025	0.0025	0.0025	0.0025	0.005	0.0025	0.0025	0.005	0.0025	0.005	0.0025	0.0025	0.0025	0.0025	0.025	0.0025	0.005	
Median Concentration	0.0025	0.0025	0.0025	0.0025	0.005	0.0025	0.0025	0.005	0.0025	0.005	0.0025	0.0025	0.0025	0.0025	0.025	0.0025	0.005	
Standard Deviation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

*A Non-Detect Multiplier of 0.5 has been applied.

Environmental Standards Comments

#1:Arsenic: HIL assumes 70% oral bioavailability. Site-specific bioavailability m
#2:In the absence of a guideline value for total chromium, chromium VI value a
#3:Lead: HILs A,B,C based on blood lead models (IEUBK & HIL D on adult lea
#4:Elemental mercury: HIL does not address elemental mercury. a site specific
#5:Total PAHs: Based on sum of 16 most common reported (WHO 98). HIL ap
#6:Carcinogenic PAHs: HIL based on 8 carc. PAHs & their TEFs (rel to BaP re
#7:PCBs: HIL refers to non-dioxin like PCBs only. Where PCB source is knowr
#8:Not limiting: Derived soil HSL exceeds soil saturation concentration
#9:To obtain F1 subtract the sum of BTEX concentrations from the C6 - C10 fi
#10:Only applies where the FA & AF are able to be quantified by gravimetric p

Data Comments

Appendix E

Surface water analytical results

				Surrogate			Metals								BTEXN								TRH - NEPM 2013							TRH - NEPM 2013 - SG Cleanup					
				1,2-Dichlorobenzene-D4	4-Bromofluorobenzene	Toluene-D8	Arsenic (Filtered)	Cadmium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Lead (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Zinc (Filtered)	Benzene	Toluene	Ethylbenzene	Xylene (o)	Xylene (m & p)	Xylenes (Sum of Total) - Calc	BTEX (Sum of Total) - Calc	Naphthalene	F1 (C6-C10 minus BTEX)	C6-C10 Fraction	F2 (>C10-C16 minus Naphthalene)	>C10-C16 Fraction	F3 (>C16-C34 Fraction)	F4 (>C34-C40 Fraction)	>C10-C40 (Sum of Total)	F2 (>C10-C16 minus Naphthalene) SG Cleanup	>C10-C16 SG Cleanup	>C16-C34 SG Cleanup	>C34-C40 SG Cleanup	>C10-C40 (sum) SG Cleanup
				µg/L	%	%	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				200	2	2	0.001	0.0001	0.001	0.001	0.001	0.0001	0.001	0.005	1	2	2	2	2	2	1	5	20	20	100	100	100	100	100	100	100	100	100	100	100
ANZG (2018) - FW - 90% (updated 26 July 2021)							0.042[#1]	0.0004	0.006[#2]	0.0018	0.0056	0.0019	0.013	0.015	1300	230	110	470				37														
ADWG 2011 Recreational (v3.7 updated 2022)							0.1	0.02		20	0.1	0.01	0.2		10	8000	3000			6000															
Site ID	**Location Code**	**Sample Date**	**Field ID**																																	
ACT MRF	CA2005930-001MRF01	03-Sep-20	CA2005930-001MRF01	10,700[#1]	98[#1]	102[#1]	<0.001[#1]	<0.0001[#1]	<0.001[#1]	0.004[#1]	<0.001[#1]	<0.0001[#1]	0.003[#1]	<0.005[#1]	<1[#1]	<2[#1]	<2[#1]	<2[#1]	<2[#1]	<2[#1]	<1[#1]	<5[#1]	<20[#1]	<20[#1]	<100[#1]	<100[#1]	<100[#1]	<100[#1]	<100[#1]	<100[#1]	<100[#1]	<100[#1]	<100[#1]	<100[#1]	<100[#1]

Environmental Standards Comments
#1:In absence of total As guideline, As (V) guideline has been adopted.
#2:In absence of total Cr guideline, Cr (VI) guideline has been adopted.

Data Comments
#1 PRELIMINARY RESULT MANUALLY UPLOADED BY GHD (JULY 2023)

				TRH - NEPM 1999					TRH - NEPM 1999 - SG Cleanup			
				C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 (Sum of Total)	C10-C14 SG Cleanup	C15-C28	C29-C36 SG Cleanup	C10-C36 (sum) SG Cleanup
				µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL				20	50	100	50	50	50	100	50	50
ANZG (2018) - FW - 90% (updated 26 July 2021)												
ADWG 2011 Recreational (v3.7 updated 2022)												
Site ID	**Location Code**	**Sample Date**	**Field ID**									
ACT MRF	CA2005930-001MRF01	03-Sep-20	CA2005930-001MRF01	<20[#1]	<50[#1]	<100[#1]	<50[#1]	<50[#1]	<50[#1]	<100[#1]	<50[#1]	<50[#1]

Environmental Standards Comments
#1:In absence of total As guideline, As (V) guideline has been adopted.
#2:In absence of total Cr guideline, Cr (VI) guideline has been adopted.

Data Comments
#1 PRELIMINARY RESULT MANUALLY UPLOADED BY GHD (JULY 2023)

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2031505**	Page	: 1 of 5
Client	: **ALS WATER RESOURCES GROUP**	Laboratory	: Environmental Division Sydney
Contact	: RESULTS ADDRESS (Fyshwick)	Contact	: Customer Services ES
Address	: 16B LITHGOW STREET FYSHWICK ACT, AUSTRALIA 2609	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 6202 5431	Telephone	: +61-2-8784 8555
Project	: CA2005930	Date Samples Received	: 08-Sep-2020 10:00
Order number	: ----	Date Analysis Commenced	: 09-Sep-2020
C-O-C number	: ----	Issue Date	: 15-Sep-2020 13:00
Sampler	: ----		
Site	: ----		
Quote number	: EN/109/18 - ALS CANBERRA BQ FOR ES		
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. 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*
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EG035: Poor matrix spike recovery was obtained for Mercury on sample ES2031490 # 2. Confirmed by re-analysis.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CA2005930-001 MRF01	----	----	----	----
				Client sampling date / time	03-Sep-2020 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2031505-001	--------	--------	--------	--------
					Result	----	----	----	----
EG020F: Dissolved Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		<0.001	----	----	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	----	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	----	----	----	----
Copper	7440-50-8	0.001	mg/L		**0.004**	----	----	----	----
Nickel	7440-02-0	0.001	mg/L		**0.003**	----	----	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	----	----	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	----	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	----	----	----
EP071 SG: Total Petroleum Hydrocarbons - Silica gel cleanup									
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		<50	----	----	----	----
EP071 SG: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Silica gel cleanup									
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	----	----	----	----
>C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	20	µg/L		<20	----	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	20	µg/L		<20	----	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	CA2005930-001 MRF01	----	----	----	----
				Client sampling date / time	03-Sep-2020 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2031505-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ **>C10 - C40 Fraction (sum)**	----	100	µg/L		<100	----	----	----	----
^ **>C10 - C16 Fraction minus Naphthalene (F2)**	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	1	µg/L		<1	----	----	----	----
Toluene	108-88-3	2	µg/L		<2	----	----	----	----
Ethylbenzene	100-41-4	2	µg/L		<2	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L		<2	----	----	----	----
ortho-Xylene	95-47-6	2	µg/L		<2	----	----	----	----
^ **Total Xylenes**	----	2	µg/L		<2	----	----	----	----
^ **Sum of BTEX**	----	1	µg/L		<1	----	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**107**	----	----	----	----
Toluene-D8	2037-26-5	2	%		**102**	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%		**98.0**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **WATER**		Recovery Limits (%)	
Compound	*CAS Number*	*Low*	*High*
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128

Appendix F

Chain of custody and laboratory analytical certificates for soil samples

CHAIN OF CUSTODY RECORD

Eurofins | Environment Testing ABN 50 005 085 521

☑ **Sydney Laboratory** Unit F3 Bld.F 16 Mars Road Lane Cove West NSW 2066 02 9900 8400 EnviroSampleNSW@eurofins.com

☐ **Brisbane Laboratory** Unit 1 21 Smallwood Place Murarrie QLD 4172 07 3902 4600 EnviroSampleQLD@eurofins.com

☐ **Perth Laboratory** Unit 2 91 Leach Highway Kewdale WA 6105 08 9251 9600 EnviroSampleWA@eurofins.com

☐ **Melbourne Laboratory** 6 Monterey Road Dandenong South VIC 3175 03 8564 5000 EnviroSampleVic@eurofins.com

Company	GHD	Project №	12540460	Project Manager	Rachel Stuckey
Address	Level 7, 16 Marcus Clarke Street Canberra ACT 2601 Australia	Project Name	Hume FOGO and MRF Project Delivery	EDD Format (ESdat, EQuIS etc)	Esdat
Contact Name	Rachel Stuckey				
Phone №	0435827593				
Special Directions					
Purchase Order	12540460				
Quote ID №					

Sampler(s)	Rachel Stuckey
Handed over by	Rachel Stuckey
Email for Invoice	Grant.Erbacher@ghd.com
Email for Results	Rachel.stuckey@ghd.com

Analyses Where metals are requested, please specify "Total" or "Filtered". SUITE code must be used to attract SUITE pricing.

№	Client Sample ID	Sampled Date/Time dd/mm/yy hh:mm	Matrix Solid (S) Water (W)	B7 : TRH, BTEXN, PAH, Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg)	B15 : OCP, OPP, PCB	Semi-Volatile Chlorinated Hydrocarbons (Semi-Vol CHC)	PFAS Extended Suite - 30 PFAS	Asbestos Identification in Soil - NEPM & WA Guidelines	HOLD	500mL Plastic	250mL Plastic	125mL Plastic	200mL Amber Glass	40mL VOA vial	500mL PFAS Bottle	Jar (Glass or HDPE)	Other (Asbestos AS4964, WA Guidelines)	Sample Comments / Dangerous Goods Hazard Warning
	BH05_0.0-0.1	4/7/23	S	X												1		
	BH05_0.3-0.5			X	X	X	X									2		
	BH05_1.0-1.3								X							1		
	BH05_1.8-2.0								X							1		
	BH05_2.8_3.0								X							1		
	BH06-0.5-0.8			X			X									2		
	QC101			X			X									2		
	QC201			X			X									2		
	BH06 1.0-1.2			X	X	X										1		
	BH06 2.8-3.0								X							1		
	BH04_0.3-0.5			X	X	X	X	X								2	1	
	BH04_1.2-1.5			X												1		
	BH04_2.5-3.0								X							1		
	BH03_0.3-0.5			X	X	X	X	X								2	1	

Containers Change container type & size if necessary

Required Turnaround Time (TAT) Default will be 5 days if not ticked.

♦Surcharge will apply

- ☐ Overnight (reporting by 9am)♦
- ☐ Same day♦ ☐ 1 day♦
- ☐ 2 days♦ ☒ 3 days♦
- ☑ 5 days (Standard)
- ☐ Other( )

			G7	B15	Semi Vol CHC	PFAS	Asbestos	HOLD	jar	bag	
BH03_1.0-1.2	417123	S	X						2		
BH03_2.0-2.2								X	1		
BH03_2.8-3.0								X	1		
BH01_0.3-0.5			X						2		
BH01_1.2-1.5			X	X	X	X	X		2	1	
BH01_2.8-3.0								X	1		
BH02_0.3-0.5			X	X	X	X	X		2	1	
BH02_1.2-1.5			X						2		
BH02_2.3-2.5								X		1	
BH02_2.8-3.0		↓						X		1	
QC301		W	X								rinsate
Transport spike		S	X								
Total Counts											

Time	
Temperature	13.0
Report №	100497

Method of Shipment: ☐ Courier (#) ☑ Hand Delivered ☐ Postal Name Signature Date

Laboratory Use Only

Received By: C Boxall (ACT) SYD | BNE | MEL | PER | ADL | NTL | DRW Signature Date 417123 Time 3:15pm

Received By: SYD | BNE | MEL | PER | ADL | NTL | DRW Signature Date Time

14.6
12.2
14.8 -0.9

RE: Eurofins Sample Receipt Advice - Report 1004697 : Site HUME FOGO AND MRF PROJECT DELIVERY (125404560)

Rachel Stuckey <Rachel.Stuckey@ghd.com.au>
Wed 7/5/2023 1:51 PM

To:Libby Boxsell <LibbyBoxsell@eurofins.com>

Yes please

From: Libby Boxsell <LibbyBoxsell@eurofins.com>
Sent: Wednesday, July 5, 2023 1:40 PM
To: Rachel Stuckey <Rachel.Stuckey@ghd.com.au>
Subject: Re: Eurofins Sample Receipt Advice - Report 1004697 : Site HUME FOGO AND MRF PROJECT DELIVERY (125404560)

So, you would like me to label BH06_0.3-0.5 as BH06_0.5-0.8?

Kind regards,

Libby Boxsell

Laboratory Technician

Eurofins Environment Testing Australia Pty Ltd

Unit 1, 2 Dacre Street,
Mitchell ACT 2911

Email: LibbyBoxsell@eurofins.com

Website: Eurofins Environment Testing Australia

From: Rachel Stuckey <Rachel.Stuckey@ghd.com.au>
Sent: Wednesday, July 5, 2023 1:38 PM
To: Libby Boxsell <LibbyBoxsell@eurofins.com>
Subject: RE: Eurofins Sample Receipt Advice - Report 1004697 : Site HUME FOGO AND MRF PROJECT DELIVERY (125404560)

No worries, I think the PFAS jar was incorrectly labelled and it is supposed to say BH06_0.5-0.8 – could you please amend that and analyse it for PFAS?

Other than that, happy with everything else!

Thanks,

Rachel Stuckey (she/her)
BSci (Chemistry), BENSU (Environmental Science)
Graduate Environmental Scientist

GHD
Proudly employee-owned | ghd.com
Level 7, 16 Marcus Clarke Street Canberra ACT 2601 Australia
D +61 2 6113 3398 **M** +61 435 827 593 **E** rachel.stuckey@ghd.com

From: Libby Boxsell <LibbyBoxsell@eurofins.com>
Sent: Wednesday, July 5, 2023 1:31 PM
To: Rachel Stuckey <Rachel.Stuckey@ghd.com.au>
Subject: Re: Eurofins Sample Receipt Advice - Report 1004697 : Site HUME FOGO AND MRF PROJECT DELIVERY (125404560)

Hi Rachel,

One PFAS - apologies I wasn't specific

Kind regards,

Libby Boxsell

Laboratory Technician

Eurofins Environment Testing Australia Pty Ltd

Unit 1, 2 Dacre Street,
Mitchell ACT 2911

Email: LibbyBoxsell@eurofins.com

Website: Eurofins Environment Testing Australia

From: Rachel Stuckey <Rachel.Stuckey@ghd.com.au>
Sent: Wednesday, July 5, 2023 1:30 PM
To: Libby Boxsell <LibbyBoxsell@eurofins.com>
Subject: RE: Eurofins Sample Receipt Advice - Report 1004697 : Site HUME FOGO AND MRF PROJECT DELIVERY (125404560)

Thanks Libby.

Was BH06_0.3-0.5 one jar and one PFAS?

From: LibbyBoxsell@eurofins.com <LibbyBoxsell@eurofins.com>
Sent: Wednesday, July 5, 2023 12:29 PM
To: Rachel Stuckey <Rachel.Stuckey@ghd.com.au>
Subject: Eurofins Sample Receipt Advice - Report 1004697 : Site HUME FOGO AND MRF PROJECT DELIVERY (125404560)

Dear Rachel,

BH06_0.3-0.5 received but is not on the CoC - this has been placed on HOLD. Please advise analysis. Transport spike not received so has been cancelled. BH06_0.5-0.8 - only a jar received. Will check with lab if PFAS can be done from this.

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins Analytical Services Manager as soon as possible to make certain that they get changed.

Kind regards,
Libby

View our latest EnviroNotes

RE: Eurofins Sample Receipt Advice - Report 1004697 : Site HUME FOGO AND MRF PROJECT DELIVERY (125404560)

Rachel Stuckey <Rachel.Stuckey@ghd.com.au>
Wed 7/5/2023 3:20 PM
To:Libby Boxsell <LibbyBoxsell@eurofins.com>

Can you please send QC201 to ALS with the CoC?

From: LibbyBoxsell@eurofins.com <LibbyBoxsell@eurofins.com>
Sent: Wednesday, July 5, 2023 2:02 PM
To: Rachel Stuckey <Rachel.Stuckey@ghd.com.au>
Subject: Eurofins Sample Receipt Advice - Report 1004697 : Site HUME FOGO AND MRF PROJECT DELIVERY (125404560)

Dear Rachel,

Sample received as BH06_0.3-0.5 has been labelled as BH06_0.5-0.8 as per conversation with client. Transport spike not received so has been cancelled.

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins Analytical Services Manager as soon as possible to make certain that they get changed.

Kind regards,
Libby Boxsell

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Sample Receipt Advice

Company name:	GHD Pty Ltd ACT
Contact name:	Rachel Stuckey
Project name:	HUME FOGO AND MRF PROJECT DELIVERY
Project ID:	125404560
Turnaround time:	5 Day
Date/Time received	Jul 4, 2023 3:15 PM
Eurofins reference	1004697

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 received as BH06_0.3-0.5 has been labelled as BH06_0.5-0.8 as per conversation with client. Transport spike not received so has been cancelled. QC201 to be sent to ALS as per conversation with client

Contact

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

Bonnie Pu on phone : or by email: BonniePu@eurofins.com

Results will be delivered electronically via email to Rachel Stuckey - Rachel.Stuckey@ghd.com.au.

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

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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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Company Name: GHD Pty Ltd ACT
Address: Level 7/16 Marcus Clarke St
Canberra
ACT 2601

Project Name: HUME FOGO AND MRF PROJECT DELIVERY
Project ID: 125404560

Order No.: 12540460
Report #: 1004697
Phone: 02 6253 1999
Fax: 02 6253 1911

Received: Jul 4, 2023 3:15 PM
Due: Jul 11, 2023
Priority: 5 Day
Contact Name: Rachel Stuckey

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Chlorinated Hydrocarbons	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254									X	X			
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	BH05_0.0-0.1	Jul 04, 2023		Soil	R23-JI0004303						X	X	
2	BH05_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004304				X	X	X	X	X
3	BH06_0.5-0.8	Jul 04, 2023		Soil	R23-JI0004305						X	X	X
4	QC101	Jul 04, 2023		Soil	R23-JI0004306						X	X	X
5	QC201	Jul 04, 2023		Soil	R23-JI0004307		X						
6	BH06_1.0-1.2	Jul 04, 2023		Soil	R23-JI0004308				X	X	X	X	
7	BH04_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004309	X			X	X	X	X	X
8	BH04_1.2-1.5	Jul 04, 2023		Soil	R23-JI0004310						X	X	
9	BH03_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004311	X			X	X	X	X	X
10	BH03_1.0-1.2	Jul 04, 2023		Soil	R23-JI0004312						X	X	
11	BH01_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004313						X	X	
12	BH01_1.2-1.5	Jul 04, 2023		Soil	R23-JI0004314	X			X	X	X	X	X

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Priority: 5 Day
Contact Name: Rachel Stuckey

Eurofins Analytical Services Manager : Bonnie Pu

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Melbourne Laboratory - NATA # 1261 Site # 1254									X	X			
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X
13	BH02_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004315	X			X	X	X	X	X
14	BH02_1.2-1.5	Jul 04, 2023		Soil	R23-JI0004316						X	X	
15	QC301	Jul 04, 2023		Water	R23-JI0004317							X	
16	TRANSPORT SPIKE	Jul 04, 2023		Soil	R23-JI0004318		X						
17	BH05_1.0-1.3	Jul 04, 2023		Soil	R23-JI0004319			X					
18	BH05_1.8-2.0	Jul 04, 2023		Soil	R23-JI0004320			X					
19	BH05_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004321			X					
20	BH06_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004322			X					
21	BH04_2.5-3.0	Jul 04, 2023		Soil	R23-JI0004323			X					
22	BH03_2.0-2.2	Jul 04, 2023		Soil	R23-JI0004324			X					
23	BH03_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004325			X					
24	BH01_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004326			X					
25	BH02_2.3-2.5	Jul 04, 2023		Soil	R23-JI0004327			X					
26	BH02_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004328			X					

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Fax: 02 6253 1911

Received: Jul 4, 2023 3:15 PM
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Priority: 5 Day
Contact Name: Rachel Stuckey

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Chlorinated Hydrocarbons	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254									X	X			
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X
27	BH06_0.3-0.5	Jul 04, 2023		Soil	R23-JI0006246		X						
Test Counts						4	3	10	6	6	13	14	7

GHD Pty Ltd ACT
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NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
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Attention:	Rachel Stuckey
Report	1004697-AID
Project Name	HUME FOGO AND MRF PROJECT DELIVERY
Project ID	125404560
Received Date	Jul 04, 2023
Date Reported	Jul 13, 2023

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name HUME FOGO AND MRF PROJECT DELIVERY
Project ID 125404560
Date Sampled Jul 04, 2023
Report 1004697-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
BH04_0.3-0.5	23-Jl0004309	Jul 04, 2023	Approximate Sample 258g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH03_0.3-0.5	23-Jl0004311	Jul 04, 2023	Approximate Sample 455g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH01_1.2-1.5	23-Jl0004314	Jul 04, 2023	Approximate Sample 207g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
BH02_0.3-0.5	23-Jl0004315	Jul 04, 2023	Approximate Sample 450g Sample consisted of: Brown fine-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

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
Asbestos - LTM-ASB-8020	Sydney	Jul 04, 2023	Indefinite

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Received: Jul 4, 2023 3:15 PM
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Contact Name: Rachel Stuckey

Project Name: HUME FOGO AND MRF PROJECT DELIVERY
Project ID: 125404560

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Chlorinated Hydrocarbons	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254												X	
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	BH05_0.0-0.1	Jul 04, 2023		Soil	R23-JI0004303						X	X	
2	BH05_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004304				X	X	X	X	X
3	BH06_0.5-0.8	Jul 04, 2023		Soil	R23-JI0004305						X	X	X
4	QC101	Jul 04, 2023		Soil	R23-JI0004306						X	X	X
5	QC201	Jul 04, 2023		Soil	R23-JI0004307		X						
6	BH06_1.0-1.2	Jul 04, 2023		Soil	R23-JI0004308				X	X	X	X	
7	BH04_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004309	X			X	X	X	X	X
8	BH04_1.2-1.5	Jul 04, 2023		Soil	R23-JI0004310						X	X	
9	BH03_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004311	X			X	X	X	X	X
10	BH03_1.0-1.2	Jul 04, 2023		Soil	R23-JI0004312						X	X	
11	BH01_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004313						X	X	
12	BH01_1.2-1.5	Jul 04, 2023		Soil	R23-JI0004314	X			X	X	X	X	X

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Melbourne Laboratory - NATA # 1261 Site # 1254												X	
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X
13	BH02_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004315	X			X	X	X	X	X
14	BH02_1.2-1.5	Jul 04, 2023		Soil	R23-JI0004316						X	X	
15	QC301	Jul 04, 2023		Water	R23-JI0004317							X	
16	TRANSPORT SPIKE	Jul 04, 2023		Soil	R23-JI0004318		X						
17	BH05_1.0-1.3	Jul 04, 2023		Soil	R23-JI0004319			X					
18	BH05_1.8-2.0	Jul 04, 2023		Soil	R23-JI0004320			X					
19	BH05_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004321			X					
20	BH06_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004322			X					
21	BH04_2.5-3.0	Jul 04, 2023		Soil	R23-JI0004323			X					
22	BH03_2.0-2.2	Jul 04, 2023		Soil	R23-JI0004324			X					
23	BH03_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004325			X					
24	BH01_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004326			X					
25	BH02_2.3-2.5	Jul 04, 2023		Soil	R23-JI0004327			X					
26	BH02_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004328			X					

eurofins

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Order No.: 12540460
Report #: 1004697
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Received: Jul 4, 2023 3:15 PM
Due: Jul 11, 2023
Priority: 5 Day
Contact Name: Rachel Stuckey

Project Name: HUME FOGO AND MRF PROJECT DELIVERY
Project ID: 125404560

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Chlorinated Hydrocarbons	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254												X	
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X
27	BH06_0.3-0.5	Jul 04, 2023		Soil	R23-JI0006246		X						
Test Counts						4	3	10	6	6	13	14	7

Internal Quality Control Review and Glossary General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with the colour **blue** indicates data provided by customer that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to the most recent version of the 'Sample Preservation and Container Guide' for holding times (QS3001).
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.

Units

% w/w:	Percentage weight-for-weight basis, e.g. of asbestos in asbestos-containing finds in soil samples (**% w/w**)
F/fld	Airborne fibre filter loading as Fibres (**N**) per Fields counted (**n**)
F/mL	Airborne fibre reported concentration as Fibres per millilitre of air drawn over the sampler membrane (**C**)
g, kg	Mass, e.g. of whole sample (**M**) or asbestos-containing find within the sample (**m**)
g/kg	Concentration in grams per kilogram
L, mL	Volume, e.g. of air as measured in AFM (**V** = **r** x **t**)
L/min	Airborne fibre sampling Flowrate as litres per minute of air drawn over the sampler membrane (**r**)
min	Time (**t**), e.g. of air sample collection period

Calculations

Airborne Fibre Concentration: $C = \left(\frac{A}{a}\right) \times \left(\frac{N}{n}\right) \times \left(\frac{1}{r}\right) \times \left(\frac{1}{t}\right) = K \times \left(\frac{N}{n}\right) \times \left(\frac{1}{V}\right)$

Asbestos Content (as asbestos): $\%\, w/w = \frac{(m \times P_A)}{M}$

Weighted Average (of asbestos): $\%_{WA} = \sum \frac{(m \times P_A)_x}{x}$

Terms

%asbestos	Estimated percentage of asbestos in a given matrix. May be derived from knowledge or experience of the material, informed by HSG264 *Appendix 2*, else assumed to be 15% in accordance with WA DOH *Appendix 2* (**P_A**).
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded (non-friable) condition. For the purposes of the NEPM and WA DOH, ACM corresponds to material larger than 7 mm x 7 mm.
AF	Asbestos Fines. Asbestos contamination within a soil sample, as defined by WA DOH. Includes loose fibre bundles and small pieces of friable and non-friable material such as asbestos cement fragments mixed with soil. Considered under the NEPM as equivalent to “non-bonded / friable”.
AFM	Airborne Fibre Monitoring, e.g. by the MFM.
Amosite	Amosite Asbestos Detected. Amosite may also refer to Fibrous Grunerite or Brown Asbestos. Identified in accordance with AS 4964-2004.
AS	Australian Standard.
Asbestos Content (as asbestos)	Total % w/w asbestos content in asbestos-containing finds in a soil sample (**% w/w)**.
Chrysotile	Chrysotile Asbestos Detected. Chrysotile may also refer to Fibrous Serpentine or White Asbestos. Identified in accordance with AS 4964-2004.
COC	Chain of Custody.
Crocidolite	Crocidolite Asbestos Detected. Crocidolite may also refer to Fibrous Riebeckite or Blue Asbestos. Identified in accordance with AS 4964-2004.
Dry	Sample is dried by heating prior to analysis.
DS	Dispersion Staining. Technique required for Unequivocal Identification of asbestos fibres by PLM.
FA	Fibrous Asbestos. Asbestos containing material that is wholly or in part friable, including materials with higher asbestos content with a propensity to become friable with handling, and any material that was previously non-friable and in a severely degraded condition. For the purposes of the NEPM and WA DOH, FA generally corresponds to material larger than 7 mm x 7 mm, although FA may be more difficult to visibly distinguish and may be assessed as AF.
Fibre Count	Total of all fibres (whether asbestos or not) meeting the counting criteria set out in the NOHSC:3003
Fibre ID	Fibre Identification. Unequivocal identification of asbestos fibres according to AS 4964-2004. Includes Chrysotile, Amosite (Grunerite) or Crocidolite asbestos.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
HSG248	UK HSE HSG248, *Asbestos: The Analysts Guide*, 2nd Edition (2021).
HSG264	UK HSE HSG264, *Asbestos: The Survey Guide* (2012).
ISO (also ISO/IEC)	International Organization for Standardization / International Electrotechnical Commission.
K Factor	Microscope constant (**K**) as derived from the effective filter area of the given AFM membrane used for collecting the sample (**A**) and the projected eyepiece graticule area of the specific microscope used for the analysis (**a**).
LOR	Limit of Reporting.
MFM (also NOHSC:3003)	Membrane Filter Method. As described by the Australian Government National Occupational Health and Safety Commission, *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres*, 2nd Edition [NOHSC:3003(2005)].
NEPM (also ASC NEPM)	National Environment Protection (Assessment of Site Contamination) Measure, (2013, as amended).
Organic	Organic Fibres Detected. Organic may refer to Natural or Man-Made Polymeric Fibres. Identified in accordance with AS 4964-2004.
PCM	Phase Contrast Microscopy. As used for Fibre Counting according to the MFM.
PLM	Polarised Light Microscopy. As used for Fibre Identification and Trace Analysis according to AS 4964-2004.
Sampling	Unless otherwise stated Eurofins are not responsible for sampling equipment or the sampling process.
SMF	Synthetic Mineral Fibre Detected. SMF may also refer to Man Made Vitreous Fibres. Identified in accordance with AS 4964-2004.
SRA	Sample Receipt Advice.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres (particularly asbestos) in a given sample matrix.
UK HSE HSG	United Kingdom, Health and Safety Executive, Health and Safety Guidance, publication.
UMF	Unidentified Mineral Fibre Detected. Fibrous minerals that are detected but have not been unequivocally identified by PLM with DS according the AS 4964-2004. May include (but not limited to) Actinolite, Anthophyllite or Tremolite asbestos.
WA DOH	Reference document for the NEPM. Government of Western Australia, *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia* (updated 2021), including Appendix Four: *Laboratory analysis*
Weighted Average	Combined average % w/w asbestos content of all asbestos-containing finds in the given aliquot or total soil sample (**$\%_{WA}$**).

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

Asbestos Counter/Identifier:

Chamath JHM Annakkage	Senior Analyst-Asbestos

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos

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.

GHD Pty Ltd ACT
Level 7/16 Marcus Clarke St
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ACT 2601

Attention: **Rachel Stuckey**

Report **1004697-S**
Project name HUME FOGO AND MRF PROJECT DELIVERY
Project ID 125404560
Received Date Jul 04, 2023

Client Sample ID			**BH05_0.0-0.1**	**BH05_0.3-0.5**	**BH06_0.5-0.8**	**QC101**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**R23-JI0004303**	**R23-JI0004304**	**R23-JI0004305**	**R23-JI0004306**
Date Sampled			**Jul 04, 2023**	**Jul 04, 2023**	**Jul 04, 2023**	**Jul 04, 2023**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	93	95	102	118
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			BH05_0.0-0.1	BH05_0.3-0.5	BH06_0.5-0.8	QC101
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004303	R23-JI0004304	R23-JI0004305	R23-JI0004306
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	100	105	95	102
p-Terphenyl-d14 (surr.)	1	%	107	93	108	116
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Metals M8						
Arsenic	2	mg/kg	6.0	5.3	5.1	5.2
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	22	12	12	12
Copper	5	mg/kg	6.5	7.1	7.4	7.7
Lead	5	mg/kg	22	13	16	18
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	5.2	< 5	< 5
Zinc	5	mg/kg	7.0	16	11	14
Sample Properties						
% Moisture	1	%	7.3	13	8.1	8.5
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	< 0.1	-	-
4.4'-DDD	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDE	0.05	mg/kg	-	< 0.05	-	-
4.4'-DDT	0.05	mg/kg	-	< 0.05	-	-
a-HCH	0.05	mg/kg	-	< 0.05	-	-
Aldrin	0.05	mg/kg	-	< 0.05	-	-
b-HCH	0.05	mg/kg	-	< 0.05	-	-
d-HCH	0.05	mg/kg	-	< 0.05	-	-
Dieldrin	0.05	mg/kg	-	< 0.05	-	-
Endosulfan I	0.05	mg/kg	-	< 0.05	-	-
Endosulfan II	0.05	mg/kg	-	< 0.05	-	-
Endosulfan sulphate	0.05	mg/kg	-	< 0.05	-	-
Endrin	0.05	mg/kg	-	< 0.05	-	-
Endrin aldehyde	0.05	mg/kg	-	< 0.05	-	-
Endrin ketone	0.05	mg/kg	-	< 0.05	-	-
g-HCH (Lindane)	0.05	mg/kg	-	< 0.05	-	-
Heptachlor	0.05	mg/kg	-	< 0.05	-	-
Heptachlor epoxide	0.05	mg/kg	-	< 0.05	-	-
Hexachlorobenzene	0.05	mg/kg	-	< 0.05	-	-
Methoxychlor	0.05	mg/kg	-	< 0.05	-	-
Toxaphene	0.5	mg/kg	-	< 0.5	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	< 0.05	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	< 0.05	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	-	86	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	89	-	-

Client Sample ID			BH05_0.0-0.1	BH05_0.3-0.5	BH06_0.5-0.8	QC101
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004303	R23-JI0004304	R23-JI0004305	R23-JI0004306
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
Chlorinated Hydrocarbons						
1.2-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.2.3-Trichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.2.3.4-Tetrachlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.2.3.5-Tetrachlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.2.4-Trichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.2.4.5-Tetrachlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.3-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.3.5-Trichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
1.4-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	-
Benzal chloride	0.05	mg/kg	-	< 0.05	-	-
Benzotrichloride	0.05	mg/kg	-	< 0.05	-	-
Benzyl chloride	0.5	mg/kg	-	< 0.5	-	-
Hexachlorobenzene	0.5	mg/kg	-	< 0.5	-	-
Hexachlorobutadiene	0.5	mg/kg	-	< 0.5	-	-
Hexachlorocyclopentadiene	1	mg/kg	-	< 1	-	-
Hexachloroethane	0.5	mg/kg	-	< 0.5	-	-
Pentachlorobenzene	0.5	mg/kg	-	< 0.5	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	89	-	-
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Bolstar	0.2	mg/kg	-	< 0.2	-	-
Chlorfenvinphos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos	0.2	mg/kg	-	< 0.2	-	-
Chlorpyrifos-methyl	0.2	mg/kg	-	< 0.2	-	-
Coumaphos	2	mg/kg	-	< 2	-	-
Demeton-S	0.2	mg/kg	-	< 0.2	-	-
Demeton-O	0.2	mg/kg	-	< 0.2	-	-
Diazinon	0.2	mg/kg	-	< 0.2	-	-
Dichlorvos	0.2	mg/kg	-	< 0.2	-	-
Dimethoate	0.2	mg/kg	-	< 0.2	-	-
Disulfoton	0.2	mg/kg	-	< 0.2	-	-
EPN	0.2	mg/kg	-	< 0.2	-	-
Ethion	0.2	mg/kg	-	< 0.2	-	-
Ethoprop	0.2	mg/kg	-	< 0.2	-	-
Ethyl parathion	0.2	mg/kg	-	< 0.2	-	-
Fenitrothion	0.2	mg/kg	-	< 0.2	-	-
Fensulfothion	0.2	mg/kg	-	< 0.2	-	-
Fenthion	0.2	mg/kg	-	< 0.2	-	-
Malathion	0.2	mg/kg	-	< 0.2	-	-
Merphos	0.2	mg/kg	-	< 0.2	-	-
Methyl parathion	0.2	mg/kg	-	< 0.2	-	-
Mevinphos	0.2	mg/kg	-	< 0.2	-	-
Monocrotophos	2	mg/kg	-	< 2	-	-
Naled	0.2	mg/kg	-	< 0.2	-	-
Omethoate	2	mg/kg	-	< 2	-	-
Phorate	0.2	mg/kg	-	< 0.2	-	-
Pirimiphos-methyl	0.2	mg/kg	-	< 0.2	-	-
Pyrazophos	0.2	mg/kg	-	< 0.2	-	-
Ronnel	0.2	mg/kg	-	< 0.2	-	-

Client Sample ID			BH05_0.0-0.1	BH05_0.3-0.5	BH06_0.5-0.8	QC101
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004303	R23-JI0004304	R23-JI0004305	R23-JI0004306
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Terbufos	0.2	mg/kg	-	< 0.2	-	-
Tetrachlorvinphos	0.2	mg/kg	-	< 0.2	-	-
Tokuthion	0.2	mg/kg	-	< 0.2	-	-
Trichloronate	0.2	mg/kg	-	< 0.2	-	-
Triphenylphosphate (surr.)	1	%	-	101	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1221	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1232	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1242	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1248	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1254	0.1	mg/kg	-	< 0.1	-	-
Aroclor-1260	0.1	mg/kg	-	< 0.1	-	-
Total PCB*	0.1	mg/kg	-	< 0.1	-	-
Dibutylchlorendate (surr.)	1	%	-	86	-	-
Tetrachloro-m-xylene (surr.)	1	%	-	89	-	-
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	89	92
13C5-PFPeA (surr.)	1	%	-	94	92	97
13C5-PFHxA (surr.)	1	%	-	84	89	99
13C4-PFHpA (surr.)	1	%	-	86	93	93
13C8-PFOA (surr.)	1	%	-	80	84	89
13C5-PFNA (surr.)	1	%	-	83	93	92
13C6-PFDA (surr.)	1	%	-	110	120	123
13C2-PFUnDA (surr.)	1	%	-	110	112	116
13C2-PFDoDA (surr.)	1	%	-	105	109	109
13C2-PFTeDA (surr.)	1	%	-	101	110	97
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			BH05_0.0-0.1	BH05_0.3-0.5	BH06_0.5-0.8	QC101
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004303	R23-JI0004304	R23-JI0004305	R23-JI0004306
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl sulfonamido substances						
13C8-FOSA (surr.)	1	%	-	81	85	83
D3-N-MeFOSA (surr.)	1	%	-	81	78	84
D5-N-EtFOSA (surr.)	1	%	-	89	89	86
D7-N-MeFOSE (surr.)	1	%	-	85	89	86
D9-N-EtFOSE (surr.)	1	%	-	85	85	82
D5-N-EtFOSAA (surr.)	1	%	-	95	109	109
D3-N-MeFOSAA (surr.)	1	%	-	102	119	129
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	103	101
18O2-PFHxS (surr.)	1	%	-	90	93	96
13C8-PFOS (surr.)	1	%	-	102	99	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
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	%	-	80	78	89
13C2-6:2 FTSA (surr.)	1	%	-	74	85	81
13C2-8:2 FTSA (surr.)	1	%	-	104	113	113
13C2-10:2 FTSA (surr.)	1	%	-	INT	INT	INT
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			BH06_1.0-1.2	BH04_0.3-0.5	BH04_1.2-1.5	BH03_0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004308	R23-JI0004309	R23-JI0004310	R23-JI0004311
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	97	88	81	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	100	98	96	95
p-Terphenyl-d14 (surr.)	1	%	103	98	99	92
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID			BH06_1.0-1.2	BH04_0.3-0.5	BH04_1.2-1.5	BH03_0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004308	R23-JI0004309	R23-JI0004310	R23-JI0004311
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
Metals M8						
Arsenic	2	mg/kg	3.8	3.5	4.7	3.4
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	7.7	12	7.3	8.9
Copper	5	mg/kg	< 5	< 5	< 5	< 5
Lead	5	mg/kg	9.3	12	16	9.5
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	11	5.0	6.8	< 5
Sample Properties						
% Moisture	1	%	8.2	8.6	16	12
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
a-HCH	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
b-HCH	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
d-HCH	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
g-HCH (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Methoxychlor	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Toxaphene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	82	93	-	95
Tetrachloro-m-xylene (surr.)	1	%	97	96	-	87
Chlorinated Hydrocarbons						
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.2.3-Trichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.2.3.4-Tetrachlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.2.3.5-Tetrachlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.2.4-Trichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.2.4.5-Tetrachlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.3.5-Trichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzal chloride	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05

Client Sample ID			BH06_1.0-1.2	BH04_0.3-0.5	BH04_1.2-1.5	BH03_0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004308	R23-JI0004309	R23-JI0004310	R23-JI0004311
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
Chlorinated Hydrocarbons						
Benzotrichloride	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Benzyl chloride	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Hexachlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Hexachlorobutadiene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Hexachlorocyclopentadiene	1	mg/kg	< 1	< 1	-	< 1
Hexachloroethane	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Pentachlorobenzene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Tetrachloro-m-xylene (surr.)	1	%	97	96	-	87
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Bolstar	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorfenvinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorpyrifos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Coumaphos	2	mg/kg	< 2	< 2	-	< 2
Demeton-S	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Demeton-O	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Diazinon	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Dichlorvos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Dimethoate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Disulfoton	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
EPN	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethoprop	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ethyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fenitrothion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fensulfothion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Fenthion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Malathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Merphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Methyl parathion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Mevinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Monocrotophos	2	mg/kg	< 2	< 2	-	< 2
Naled	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Omethoate	2	mg/kg	< 2	< 2	-	< 2
Phorate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Pirimiphos-methyl	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Pyrazophos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Ronnel	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Terbufos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Tetrachlorvinphos	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Tokuthion	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Trichloronate	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Triphenylphosphate (surr.)	1	%	104	96	-	85
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1232	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1242	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1

Client Sample ID			BH06_1.0-1.2	BH04_0.3-0.5	BH04_1.2-1.5	BH03_0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004308	R23-JI0004309	R23-JI0004310	R23-JI0004311
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1248	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1254	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1260	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Total PCB*	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Dibutylchlorendate (surr.)	1	%	82	93	-	95
Tetrachloro-m-xylene (surr.)	1	%	97	96	-	87
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	%	-	94	-	100
13C5-PFPeA (surr.)	1	%	-	99	-	100
13C5-PFHxA (surr.)	1	%	-	91	-	90
13C4-PFHpA (surr.)	1	%	-	96	-	91
13C8-PFOA (surr.)	1	%	-	86	-	87
13C5-PFNA (surr.)	1	%	-	90	-	90
13C6-PFDA (surr.)	1	%	-	121	-	119
13C2-PFUnDA (surr.)	1	%	-	115	-	123
13C2-PFDoDA (surr.)	1	%	-	104	-	108
13C2-PFTeDA (surr.)	1	%	-	99	-	103
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	%	-	82	-	83
D3-N-MeFOSA (surr.)	1	%	-	80	-	78
D5-N-EtFOSA (surr.)	1	%	-	88	-	87
D7-N-MeFOSE (surr.)	1	%	-	84	-	89
D9-N-EtFOSE (surr.)	1	%	-	84	-	84
D5-N-EtFOSAA (surr.)	1	%	-	127	-	122
D3-N-MeFOSAA (surr.)	1	%	-	144	-	151

Client Sample ID			BH06_1.0-1.2	BH04_0.3-0.5	BH04_1.2-1.5	BH03_0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004308	R23-JI0004309	R23-JI0004310	R23-JI0004311
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
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	%	-	116	-	107
18O2-PFHxS (surr.)	1	%	-	95	-	95
13C8-PFOS (surr.)	1	%	-	104	-	107
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	%	-	89	-	93
13C2-6:2 FTSA (surr.)	1	%	-	89	-	83
13C2-8:2 FTSA (surr.)	1	%	-	116	-	119
13C2-10:2 FTSA (surr.)	1	%	-	INT	-	INT
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

Client Sample ID			BH03_1.0-1.2	BH01_0.3-0.5	BH01_1.2-1.5	BH02_0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004312	R23-JI0004313	R23-JI0004314	R23-JI0004315
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	89	67	91	87

Client Sample ID			BH03_1.0-1.2	BH01_0.3-0.5	BH01_1.2-1.5	BH02_0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004312	R23-JI0004313	R23-JI0004314	R23-JI0004315
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Fluorobiphenyl (surr.)	1	%	86	87	99	96
p-Terphenyl-d14 (surr.)	1	%	86	88	95	91
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Metals M8						
Arsenic	2	mg/kg	4.7	7.7	< 2	2.6
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	11	16	7.8	10.0
Copper	5	mg/kg	7.1	< 5	< 5	< 5
Lead	5	mg/kg	11	18	7.1	11
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5	< 5	< 5
Zinc	5	mg/kg	8.4	< 5	11	8.8
Sample Properties						
% Moisture	1	%	12	9.1	16	10
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	< 0.1
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	< 0.05
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	< 0.05
a-HCH	0.05	mg/kg	-	-	< 0.05	< 0.05

Client Sample ID			BH03_1.0-1.2	BH01_0.3-0.5	BH01_1.2-1.5	BH02_0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004312	R23-JI0004313	R23-JI0004314	R23-JI0004315
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Aldrin	0.05	mg/kg	-	-	< 0.05	< 0.05
b-HCH	0.05	mg/kg	-	-	< 0.05	< 0.05
d-HCH	0.05	mg/kg	-	-	< 0.05	< 0.05
Dieldrin	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan I	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan II	0.05	mg/kg	-	-	< 0.05	< 0.05
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	< 0.05
Endrin ketone	0.05	mg/kg	-	-	< 0.05	< 0.05
g-HCH (Lindane)	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor	0.05	mg/kg	-	-	< 0.05	< 0.05
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	< 0.05
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	< 0.05
Methoxychlor	0.05	mg/kg	-	-	< 0.05	< 0.05
Toxaphene	0.5	mg/kg	-	-	< 0.5	< 0.5
Aldrin and Dieldrin (Total)*	0.05	mg/kg	-	-	< 0.05	< 0.05
DDT + DDE + DDD (Total)*	0.05	mg/kg	-	-	< 0.05	< 0.05
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	-	-	< 0.1	< 0.1
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	-	-	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	87	103
Tetrachloro-m-xylene (surr.)	1	%	-	-	89	89
Chlorinated Hydrocarbons						
1.2-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2.3.4-Tetrachlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2.3.5-Tetrachlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2.4.5-Tetrachlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.3.5-Trichlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
Benzal chloride	0.05	mg/kg	-	-	< 0.05	< 0.05
Benzotrichloride	0.05	mg/kg	-	-	< 0.05	< 0.05
Benzyl chloride	0.5	mg/kg	-	-	< 0.5	< 0.5
Hexachlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
Hexachlorobutadiene	0.5	mg/kg	-	-	< 0.5	< 0.5
Hexachlorocyclopentadiene	1	mg/kg	-	-	< 1	< 1
Hexachloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Pentachlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
Tetrachloro-m-xylene (surr.)	1	%	-	-	89	89
Organophosphorus Pesticides						
Azinphos-methyl	0.2	mg/kg	-	-	< 0.2	< 0.2
Bolstar	0.2	mg/kg	-	-	< 0.2	< 0.2
Chlorfenvinphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Chlorpyrifos	0.2	mg/kg	-	-	< 0.2	< 0.2
Chlorpyrifos-methyl	0.2	mg/kg	-	-	< 0.2	< 0.2
Coumaphos	2	mg/kg	-	-	< 2	< 2
Demeton-S	0.2	mg/kg	-	-	< 0.2	< 0.2

Client Sample ID			BH03_1.0-1.2	BH01_0.3-0.5	BH01_1.2-1.5	BH02_0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004312	R23-JI0004313	R23-JI0004314	R23-JI0004315
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
Organophosphorus Pesticides						
Demeton-O	0.2	mg/kg	-	-	< 0.2	< 0.2
Diazinon	0.2	mg/kg	-	-	< 0.2	< 0.2
Dichlorvos	0.2	mg/kg	-	-	< 0.2	< 0.2
Dimethoate	0.2	mg/kg	-	-	< 0.2	< 0.2
Disulfoton	0.2	mg/kg	-	-	< 0.2	< 0.2
EPN	0.2	mg/kg	-	-	< 0.2	< 0.2
Ethion	0.2	mg/kg	-	-	< 0.2	< 0.2
Ethoprop	0.2	mg/kg	-	-	< 0.2	< 0.2
Ethyl parathion	0.2	mg/kg	-	-	< 0.2	< 0.2
Fenitrothion	0.2	mg/kg	-	-	< 0.2	< 0.2
Fensulfothion	0.2	mg/kg	-	-	< 0.2	< 0.2
Fenthion	0.2	mg/kg	-	-	< 0.2	< 0.2
Malathion	0.2	mg/kg	-	-	< 0.2	< 0.2
Merphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Methyl parathion	0.2	mg/kg	-	-	< 0.2	< 0.2
Mevinphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Monocrotophos	2	mg/kg	-	-	< 2	< 2
Naled	0.2	mg/kg	-	-	< 0.2	< 0.2
Omethoate	2	mg/kg	-	-	< 2	< 2
Phorate	0.2	mg/kg	-	-	< 0.2	< 0.2
Pirimiphos-methyl	0.2	mg/kg	-	-	< 0.2	< 0.2
Pyrazophos	0.2	mg/kg	-	-	< 0.2	< 0.2
Ronnel	0.2	mg/kg	-	-	< 0.2	< 0.2
Terbufos	0.2	mg/kg	-	-	< 0.2	< 0.2
Tetrachlorvinphos	0.2	mg/kg	-	-	< 0.2	< 0.2
Tokuthion	0.2	mg/kg	-	-	< 0.2	< 0.2
Trichloronate	0.2	mg/kg	-	-	< 0.2	< 0.2
Triphenylphosphate (surr.)	1	%	-	-	88	91
Polychlorinated Biphenyls						
Aroclor-1016	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1232	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1242	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1248	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1254	0.1	mg/kg	-	-	< 0.1	< 0.1
Aroclor-1260	0.1	mg/kg	-	-	< 0.1	< 0.1
Total PCB*	0.1	mg/kg	-	-	< 0.1	< 0.1
Dibutylchlorendate (surr.)	1	%	-	-	87	103
Tetrachloro-m-xylene (surr.)	1	%	-	-	89	89
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

Client Sample ID			BH03_1.0-1.2	BH01_0.3-0.5	BH01_1.2-1.5	BH02_0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004312	R23-JI0004313	R23-JI0004314	R23-JI0004315
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
Perfluoroalkyl carboxylic acids (PFCAs)						
Perfluorotridecanoic acid (PFTrDA)[N15]	5	ug/kg	-	-	< 5	< 5
Perfluorotetradecanoic acid (PFTeDA)[N11]	5	ug/kg	-	-	< 5	< 5
13C4-PFBA (surr.)	1	%	-	-	102	102
13C5-PFPeA (surr.)	1	%	-	-	100	107
13C5-PFHxA (surr.)	1	%	-	-	94	95
13C4-PFHpA (surr.)	1	%	-	-	89	98
13C8-PFOA (surr.)	1	%	-	-	88	91
13C5-PFNA (surr.)	1	%	-	-	90	99
13C6-PFDA (surr.)	1	%	-	-	119	118
13C2-PFUnDA (surr.)	1	%	-	-	110	118
13C2-PFDoDA (surr.)	1	%	-	-	107	104
13C2-PFTeDA (surr.)	1	%	-	-	104	105
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	%	-	-	85	86
D3-N-MeFOSA (surr.)	1	%	-	-	86	85
D5-N-EtFOSA (surr.)	1	%	-	-	86	91
D7-N-MeFOSE (surr.)	1	%	-	-	87	90
D9-N-EtFOSE (surr.)	1	%	-	-	88	91
D5-N-EtFOSAA (surr.)	1	%	-	-	117	130
D3-N-MeFOSAA (surr.)	1	%	-	-	139	133
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	%	-	-	108	115
18O2-PFHxS (surr.)	1	%	-	-	99	102
13C8-PFOS (surr.)	1	%	-	-	106	105

Client Sample ID			BH03_1.0-1.2	BH01_0.3-0.5	BH01_1.2-1.5	BH02_0.3-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			R23-JI0004312	R23-JI0004313	R23-JI0004314	R23-JI0004315
Date Sampled			Jul 04, 2023	Jul 04, 2023	Jul 04, 2023	Jul 04, 2023
Test/Reference	LOR	Unit				
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	%	-	-	97	106
13C2-6:2 FTSA (surr.)	1	%	-	-	88	90
13C2-8:2 FTSA (surr.)	1	%	-	-	106	126
13C2-10:2 FTSA (surr.)	1	%	-	-	INT	181
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

Client Sample ID			BH02_1.2-1.5
Sample Matrix			Soil
Eurofins Sample No.			R23-JI0004316
Date Sampled			Jul 04, 2023
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	88
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5

Client Sample ID			BH02_1.2-1.5
Sample Matrix			**Soil**
Eurofins Sample No.			**R23-JI0004316**
Date Sampled			**Jul 04, 2023**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Anthracene	0.5	mg/kg	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	< 0.5
Total PAH*	0.5	mg/kg	< 0.5
2-Fluorobiphenyl (surr.)	1	%	86
p-Terphenyl-d14 (surr.)	1	%	87
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
Metals M8			
Arsenic	2	mg/kg	3.3
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	6.9
Copper	5	mg/kg	< 5
Lead	5	mg/kg	8.8
Mercury	0.1	mg/kg	< 0.1
Nickel	5	mg/kg	< 5
Zinc	5	mg/kg	< 5
Sample Properties			
% Moisture	1	%	12

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jul 11, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jul 11, 2023	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jul 11, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Jul 11, 2023	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jul 11, 2023	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Sydney	Jul 11, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
% Moisture	Sydney	Jul 04, 2023	14 Days
- Method: LTM-GEN-7080 Moisture			
Eurofins Suite B15			
Organochlorine Pesticides	Sydney	Jul 11, 2023	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Organophosphorus Pesticides	Sydney	Jul 11, 2023	14 Days
- Method: LTM-ORG-2200 Organophosphorus Pesticides by GC-MS			
Polychlorinated Biphenyls	Sydney	Jul 11, 2023	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Chlorinated Hydrocarbons	Sydney	Jul 11, 2023	14 Days
- Method: LTM-ORG-2130 PAH by GCMS			
Per- and Polyfluoroalkyl Substances (PFASs)			
Perfluoroalkyl carboxylic acids (PFCAs)	Sydney	Jul 11, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonamido substances	Sydney	Jul 11, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
Perfluoroalkyl sulfonic acids (PFSAs)	Sydney	Jul 11, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)	Sydney	Jul 11, 2023	28 Days
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			
PFASs Summations	Sydney	Jul 04, 2023	
- Method: LTM-ORG-2100 Per- and Polyfluoroalkyl Substances (PFAS)			

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ACT 2601

Project Name: HUME FOGO AND MRF PROJECT DELIVERY
Project ID: 125404560

Order No.: 12540460
Report #: 1004697
Phone: 02 6253 1999
Fax: 02 6253 1911

Received: Jul 4, 2023 3:15 PM
Due: Jul 11, 2023
Priority: 5 Day
Contact Name: Rachel Stuckey

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Chlorinated Hydrocarbons	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254									X	X			
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	BH05_0.0-0.1	Jul 04, 2023		Soil	R23-JI0004303						X	X	
2	BH05_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004304				X	X	X	X	X
3	BH06_0.5-0.8	Jul 04, 2023		Soil	R23-JI0004305						X	X	X
4	QC101	Jul 04, 2023		Soil	R23-JI0004306						X	X	X
5	QC201	Jul 04, 2023		Soil	R23-JI0004307		X						
6	BH06_1.0-1.2	Jul 04, 2023		Soil	R23-JI0004308				X	X	X	X	
7	BH04_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004309	X			X	X	X	X	X
8	BH04_1.2-1.5	Jul 04, 2023		Soil	R23-JI0004310						X	X	
9	BH03_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004311	X			X	X	X	X	X
10	BH03_1.0-1.2	Jul 04, 2023		Soil	R23-JI0004312						X	X	
11	BH01_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004313						X	X	
12	BH01_1.2-1.5	Jul 04, 2023		Soil	R23-JI0004314	X			X	X	X	X	X

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Project Name: HUME FOGO AND MRF PROJECT DELIVERY
Project ID: 125404560

Order No.: 12540460
Report #: 1004697
Phone: 02 6253 1999
Fax: 02 6253 1911

Received: Jul 4, 2023 3:15 PM
Due: Jul 11, 2023
Priority: 5 Day
Contact Name: Rachel Stuckey

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Chlorinated Hydrocarbons	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254									X	X			
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X
13	BH02_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004315	X			X	X	X	X	X
14	BH02_1.2-1.5	Jul 04, 2023		Soil	R23-JI0004316						X	X	
15	QC301	Jul 04, 2023		Water	R23-JI0004317							X	
16	TRANSPORT SPIKE	Jul 04, 2023		Soil	R23-JI0004318		X						
17	BH05_1.0-1.3	Jul 04, 2023		Soil	R23-JI0004319			X					
18	BH05_1.8-2.0	Jul 04, 2023		Soil	R23-JI0004320			X					
19	BH05_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004321			X					
20	BH06_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004322			X					
21	BH04_2.5-3.0	Jul 04, 2023		Soil	R23-JI0004323			X					
22	BH03_2.0-2.2	Jul 04, 2023		Soil	R23-JI0004324			X					
23	BH03_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004325			X					
24	BH01_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004326			X					
25	BH02_2.3-2.5	Jul 04, 2023		Soil	R23-JI0004327			X					
26	BH02_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004328			X					

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Contact Name: Rachel Stuckey

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Chlorinated Hydrocarbons	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254									X	X			
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X
27	BH06_0.3-0.5	Jul 04, 2023		Soil	R23-JI0006246		X						
Test Counts						4	3	10	6	6	13	14	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							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Metals M8							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
Method Blank							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-HCH	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-HCH	mg/kg	< 0.05			0.05	Pass	
d-HCH	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-HCH (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.05			0.05	Pass	
Toxaphene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Chlorinated Hydrocarbons							
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2.3.4-Tetrachlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2.3.5-Tetrachlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2.4.5-Tetrachlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
Benzal chloride	mg/kg	< 0.05			0.05	Pass	
Benzotrichloride	mg/kg	< 0.05			0.05	Pass	
Benzyl chloride	mg/kg	< 0.5			0.5	Pass	
Hexachlorobenzene	mg/kg	< 0.5			0.5	Pass	
Hexachlorobutadiene	mg/kg	< 0.5			0.5	Pass	
Hexachlorocyclopentadiene	mg/kg	< 1			1	Pass	
Hexachloroethane	mg/kg	< 0.5			0.5	Pass	
Pentachlorobenzene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organophosphorus Pesticides							
Azinphos-methyl	mg/kg	< 0.2			0.2	Pass	
Bolstar	mg/kg	< 0.2			0.2	Pass	
Chlorfenvinphos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos	mg/kg	< 0.2			0.2	Pass	
Chlorpyrifos-methyl	mg/kg	< 0.2			0.2	Pass	
Coumaphos	mg/kg	< 2			2	Pass	
Demeton-S	mg/kg	< 0.2			0.2	Pass	
Demeton-O	mg/kg	< 0.2			0.2	Pass	
Diazinon	mg/kg	< 0.2			0.2	Pass	
Dichlorvos	mg/kg	< 0.2			0.2	Pass	
Dimethoate	mg/kg	< 0.2			0.2	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Disulfoton	mg/kg	< 0.2			0.2	Pass	
EPN	mg/kg	< 0.2			0.2	Pass	
Ethion	mg/kg	< 0.2			0.2	Pass	
Ethoprop	mg/kg	< 0.2			0.2	Pass	
Ethyl parathion	mg/kg	< 0.2			0.2	Pass	
Fenitrothion	mg/kg	< 0.2			0.2	Pass	
Fensulfothion	mg/kg	< 0.2			0.2	Pass	
Fenthion	mg/kg	< 0.2			0.2	Pass	
Malathion	mg/kg	< 0.2			0.2	Pass	
Merphos	mg/kg	< 0.2			0.2	Pass	
Methyl parathion	mg/kg	< 0.2			0.2	Pass	
Mevinphos	mg/kg	< 0.2			0.2	Pass	
Monocrotophos	mg/kg	< 2			2	Pass	
Naled	mg/kg	< 0.2			0.2	Pass	
Omethoate	mg/kg	< 2			2	Pass	
Phorate	mg/kg	< 0.2			0.2	Pass	
Pirimiphos-methyl	mg/kg	< 0.2			0.2	Pass	
Pyrazophos	mg/kg	< 0.2			0.2	Pass	
Ronnel	mg/kg	< 0.2			0.2	Pass	
Terbufos	mg/kg	< 0.2			0.2	Pass	
Tetrachlorvinphos	mg/kg	< 0.2			0.2	Pass	
Tokuthion	mg/kg	< 0.2			0.2	Pass	
Trichloronate	mg/kg	< 0.2			0.2	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.1			0.1	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.1			0.1	Pass	
Aroclor-1242	mg/kg	< 0.1			0.1	Pass	
Aroclor-1248	mg/kg	< 0.1			0.1	Pass	
Aroclor-1254	mg/kg	< 0.1			0.1	Pass	
Aroclor-1260	mg/kg	< 0.1			0.1	Pass	
Total PCB*	mg/kg	< 0.1			0.1	Pass	
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	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
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							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	88			70-130	Pass	
TRH C10-C14	%	122			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	97			70-130	Pass	
Toluene	%	96			70-130	Pass	
Ethylbenzene	%	103			70-130	Pass	
m&p-Xylenes	%	100			70-130	Pass	
o-Xylene	%	99			70-130	Pass	
Xylenes - Total*	%	100			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	87			70-130	Pass	
TRH C6-C10	%	88			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	106			70-130	Pass	
Acenaphthylene	%	83			70-130	Pass	
Anthracene	%	74			70-130	Pass	
Benz(a)anthracene	%	79			70-130	Pass	
Benzo(a)pyrene	%	71			70-130	Pass	
Benzo(b&j)fluoranthene	%	76			70-130	Pass	
Benzo(g.h.i)perylene	%	72			70-130	Pass	
Benzo(k)fluoranthene	%	76			70-130	Pass	
Chrysene	%	74			70-130	Pass	
Dibenz(a.h)anthracene	%	74			70-130	Pass	
Fluoranthene	%	85			70-130	Pass	
Fluorene	%	83			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	73			70-130	Pass	
Naphthalene	%	85			70-130	Pass	
Phenanthrene	%	87			70-130	Pass	
Pyrene	%	108			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	128			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery							
Metals M8							
Arsenic	%	85			80-120	Pass	
Cadmium	%	85			80-120	Pass	
Chromium	%	92			80-120	Pass	
Copper	%	92			80-120	Pass	
Lead	%	89			80-120	Pass	
Mercury	%	95			80-120	Pass	
Nickel	%	93			80-120	Pass	
Zinc	%	89			80-120	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	115			70-130	Pass	
4.4'-DDD	%	127			70-130	Pass	
4.4'-DDE	%	116			70-130	Pass	
4.4'-DDT	%	116			70-130	Pass	
a-HCH	%	109			70-130	Pass	
Aldrin	%	108			70-130	Pass	
b-HCH	%	120			70-130	Pass	
d-HCH	%	109			70-130	Pass	
Dieldrin	%	79			70-130	Pass	
Endosulfan I	%	109			70-130	Pass	
Endosulfan II	%	106			70-130	Pass	
Endosulfan sulphate	%	104			70-130	Pass	
Endrin	%	122			70-130	Pass	
Endrin aldehyde	%	113			70-130	Pass	
Endrin ketone	%	110			70-130	Pass	
g-HCH (Lindane)	%	103			70-130	Pass	
Heptachlor	%	121			70-130	Pass	
Heptachlor epoxide	%	111			70-130	Pass	
Hexachlorobenzene	%	107			70-130	Pass	
Methoxychlor	%	116			70-130	Pass	
LCS - % Recovery							
Chlorinated Hydrocarbons							
1.2.4-Trichlorobenzene	%	107			70-130	Pass	
1.4-Dichlorobenzene	%	114			70-130	Pass	
LCS - % Recovery							
Organophosphorus Pesticides							
Diazinon	%	95			70-130	Pass	
Dimethoate	%	76			70-130	Pass	
Ethion	%	84			70-130	Pass	
Fenitrothion	%	96			70-130	Pass	
Methyl parathion	%	112			70-130	Pass	
Mevinphos	%	84			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1016	%	101			70-130	Pass	
Aroclor-1260	%	96			70-130	Pass	
LCS - % Recovery							
Perfluoroalkyl carboxylic acids (PFCAs)							
Perfluorobutanoic acid (PFBA)	%	100			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	%	104			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	%	99			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	%	101			50-150	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Perfluorooctanoic acid (PFOA)	%	107			50-150	Pass	
Perfluorononanoic acid (PFNA)	%	103			50-150	Pass	
Perfluorodecanoic acid (PFDA)	%	103			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	%	101			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	%	98			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	%	108			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	%	104			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonamido substances							
Perfluorooctane sulfonamide (FOSA)	%	104			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	%	109			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	%	97			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	%	99			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	%	97			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	%	93			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	%	106			50-150	Pass	
LCS - % Recovery							
Perfluoroalkyl sulfonic acids (PFSAs)							
Perfluorobutanesulfonic acid (PFBS)	%	100			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	%	109			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	%	88			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	%	92			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	%	99			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	%	100			50-150	Pass	
Perfluorooctanesulfonic acid (PFOS)	%	99			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	%	103			50-150	Pass	
LCS - % Recovery							
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)							
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	%	100			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	%	97			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	%	101			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	%	97			50-150	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S23-Jl0004774	NCP	%	78			70-130	Pass	
TRH C10-C14	S23-Jl0010389	NCP	%	74			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S23-Jl0004774	NCP	%	92			70-130	Pass	
Toluene	S23-Jl0004774	NCP	%	76			70-130	Pass	
Ethylbenzene	S23-Jl0004774	NCP	%	88			70-130	Pass	
m&p-Xylenes	S23-Jl0004774	NCP	%	88			70-130	Pass	
o-Xylene	S23-Jl0004774	NCP	%	86			70-130	Pass	
Xylenes - Total*	S23-Jl0004774	NCP	%	87			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S23-Jl0004774	NCP	%	71			70-130	Pass	
TRH C6-C10	S23-Jl0004774	NCP	%	79			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S23-Jl0017827	NCP	%	97			70-130	Pass	
Acenaphthylene	S23-Jl0017827	NCP	%	107			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Anthracene	S23-Jl0017827	NCP	%	102			70-130	Pass	
Benz(a)anthracene	S23-Jl0017827	NCP	%	89			70-130	Pass	
Benzo(a)pyrene	S23-Jl0017827	NCP	%	90			70-130	Pass	
Benzo(b&j)fluoranthene	S23-Jl0017937	NCP	%	92			70-130	Pass	
Benzo(g.h.i)perylene	S23-Jl0017827	NCP	%	95			70-130	Pass	
Benzo(k)fluoranthene	S23-Jl0017827	NCP	%	97			70-130	Pass	
Chrysene	S23-Jl0017827	NCP	%	103			70-130	Pass	
Dibenz(a.h)anthracene	S23-Jl0017827	NCP	%	86			70-130	Pass	
Fluoranthene	S23-Jl0017827	NCP	%	82			70-130	Pass	
Fluorene	S23-Jl0017827	NCP	%	85			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S23-Jl0017827	NCP	%	85			70-130	Pass	
Naphthalene	S23-Jl0017827	NCP	%	97			70-130	Pass	
Phenanthrene	S23-Jl0017827	NCP	%	78			70-130	Pass	
Pyrene	S23-Jl0017827	NCP	%	84			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S23-Jl0010389	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Metals M8				Result 1					
Arsenic	S23-Jl0000383	NCP	%	96			75-125	Pass	
Cadmium	S23-Jl0000383	NCP	%	93			75-125	Pass	
Chromium	S23-Jl0000383	NCP	%	100			75-125	Pass	
Copper	S23-Jl0000383	NCP	%	101			75-125	Pass	
Lead	S23-Jl0000383	NCP	%	96			75-125	Pass	
Mercury	S23-Jl0000383	NCP	%	101			75-125	Pass	
Nickel	S23-Jl0000383	NCP	%	101			75-125	Pass	
Zinc	S23-Jl0000383	NCP	%	97			75-125	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	R23-Jn0063048	NCP	%	117			70-130	Pass	
4.4'-DDD	R23-Jn0063048	NCP	%	130			70-130	Pass	
4.4'-DDE	R23-Jn0063048	NCP	%	118			70-130	Pass	
4.4'-DDT	R23-Jn0063048	NCP	%	101			70-130	Pass	
a-HCH	R23-Jn0063048	NCP	%	117			70-130	Pass	
Aldrin	R23-Jn0063048	NCP	%	120			70-130	Pass	
b-HCH	R23-Jn0063048	NCP	%	109			70-130	Pass	
d-HCH	R23-Jn0063048	NCP	%	111			70-130	Pass	
Dieldrin	R23-Jn0063048	NCP	%	110			70-130	Pass	
Endosulfan I	R23-Jn0063048	NCP	%	117			70-130	Pass	
Endosulfan II	R23-Jn0063048	NCP	%	107			70-130	Pass	
Endosulfan sulphate	R23-Jn0063048	NCP	%	122			70-130	Pass	
Endrin	R23-Jn0063048	NCP	%	109			70-130	Pass	
Endrin aldehyde	S23-Jl0017937	NCP	%	117			70-130	Pass	
Endrin ketone	R23-Jn0063048	NCP	%	124			70-130	Pass	
g-HCH (Lindane)	R23-Jn0063048	NCP	%	120			70-130	Pass	
Heptachlor	R23-Jn0063048	NCP	%	121			70-130	Pass	
Heptachlor epoxide	R23-Jn0063048	NCP	%	122			70-130	Pass	
Hexachlorobenzene	R23-Jn0063048	NCP	%	117			70-130	Pass	
Methoxychlor	R23-Jn0063048	NCP	%	122			70-130	Pass	
Spike - % Recovery									
Organophosphorus Pesticides				Result 1					
Diazinon	R23-Jn0063048	NCP	%	106			70-130	Pass	
Dimethoate	R23-Jn0063048	NCP	%	82			70-130	Pass	
Ethion	R23-Jn0063048	NCP	%	115			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fenitrothion	R23-Jn0063048	NCP	%	115			70-130	Pass	
Methyl parathion	R23-Jn0063048	NCP	%	105			70-130	Pass	
Mevinphos	R23-Jn0063048	NCP	%	117			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1016	R23-Jn0063048	NCP	%	103			70-130	Pass	
Aroclor-1260	R23-Jn0063048	NCP	%	104			70-130	Pass	
Spike - % Recovery									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1					
Perfluorobutanoic acid (PFBA)	S23-Jn0070070	NCP	%	105			50-150	Pass	
Perfluoropentanoic acid (PFPeA)	S23-Jn0070070	NCP	%	102			50-150	Pass	
Perfluorohexanoic acid (PFHxA)	S23-Jn0070070	NCP	%	113			50-150	Pass	
Perfluoroheptanoic acid (PFHpA)	S23-Jn0070070	NCP	%	105			50-150	Pass	
Perfluorooctanoic acid (PFOA)	S23-Jn0070070	NCP	%	116			50-150	Pass	
Perfluorononanoic acid (PFNA)	S23-Jn0070070	NCP	%	109			50-150	Pass	
Perfluorodecanoic acid (PFDA)	S23-Jn0070070	NCP	%	107			50-150	Pass	
Perfluoroundecanoic acid (PFUnDA)	S23-Jn0070070	NCP	%	113			50-150	Pass	
Perfluorododecanoic acid (PFDoDA)	S23-Jn0070070	NCP	%	115			50-150	Pass	
Perfluorotridecanoic acid (PFTrDA)	S23-Jn0070070	NCP	%	115			50-150	Pass	
Perfluorotetradecanoic acid (PFTeDA)	S23-Jn0070070	NCP	%	105			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonamido substances				Result 1					
Perfluorooctane sulfonamide (FOSA)	S23-Jn0070070	NCP	%	107			50-150	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	S23-Jn0070070	NCP	%	102			50-150	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	S23-Jn0070070	NCP	%	103			50-150	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	S23-Jn0070070	NCP	%	103			50-150	Pass	
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	S23-Jn0070070	NCP	%	94			50-150	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	S23-Jn0070070	NCP	%	111			50-150	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	S23-Jn0070070	NCP	%	107			50-150	Pass	
Spike - % Recovery									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1					
Perfluorobutanesulfonic acid (PFBS)	S23-Jn0070070	NCP	%	102			50-150	Pass	
Perfluorononanesulfonic acid (PFNS)	S23-Jn0070070	NCP	%	109			50-150	Pass	
Perfluoropropanesulfonic acid (PFPrS)	S23-Jn0070070	NCP	%	93			50-150	Pass	
Perfluoropentanesulfonic acid (PFPeS)	S23-Jn0070070	NCP	%	93			50-150	Pass	
Perfluorohexanesulfonic acid (PFHxS)	S23-Jn0070070	NCP	%	102			50-150	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	S23-Jn0070070	NCP	%	96			50-150	Pass	
Perfluorodecanesulfonic acid (PFDS)	S23-Jn0070070	NCP	%	101			50-150	Pass	
Spike - % Recovery									
n:2 Fluorotelomer sulfonic acids (n:2 FTSAs)				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1H.1H.2H.2H-perfluorohexanesulfonic acid (4:2 FTSA)	S23-Jn0070070	NCP	%	110			50-150	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	S23-Jn0070070	NCP	%	104			50-150	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	S23-Jn0070070	NCP	%	112			50-150	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	S23-Jn0070070	NCP	%	103			50-150	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
a-HCH	S23-Jl0017826	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-HCH (Lindane)	S23-Jl0017826	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	R23-Jl0004306	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	R23-Jl0004306	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	R23-Jl0004306	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	R23-Jl0004306	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	R23-Jl0004306	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	R23-Jl0004306	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	R23-Jl0004306	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	R23-Jl0004306	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	R23-Jl0004306	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
Perfluoroalkyl carboxylic acids (PFCAs)				Result 1	Result 2	RPD			
Perfluorobutanoic acid (PFBA)	R23-Jl0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanoic acid (PFPeA)	R23-Jl0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanoic acid (PFHxA)	R23-Jl0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanoic acid (PFHpA)	R23-Jl0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanoic acid (PFOA)	R23-Jl0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorononanoic acid (PFNA)	R23-Jl0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanoic acid (PFDA)	R23-Jl0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroundecanoic acid (PFUnDA)	R23-Jl0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotridecanoic acid (PFTrDA)	R23-Jl0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorotetradecanoic acid (PFTeDA)	R23-Jl0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
Perfluorooctane sulfonamide (FOSA)	R23-Jl0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-methylperfluoro-1-octane sulfonamide (N-MeFOSA)	R23-Jl0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethylperfluoro-1-octane sulfonamide (N-EtFOSA)	R23-Jl0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
2-(N-methylperfluoro-1-octane sulfonamido)-ethanol(N-MeFOSE)	R23-Jl0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	

Duplicate									
Perfluoroalkyl sulfonamido substances				Result 1	Result 2	RPD			
2-(N-ethylperfluoro-1-octane sulfonamido)-ethanol(N-EtFOSE)	R23-JI0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
N-ethyl-perfluorooctanesulfonamidoacetic acid (N-EtFOSAA)	R23-JI0004306	CP	ug/kg	< 10	< 10	<1	30%	Pass	
N-methyl-perfluorooctanesulfonamidoacetic acid (N-MeFOSAA)	R23-JI0004306	CP	ug/kg	< 10	< 10	<1	30%	Pass	
Duplicate									
Perfluoroalkyl sulfonic acids (PFSAs)				Result 1	Result 2	RPD			
Perfluorobutanesulfonic acid (PFBS)	R23-JI0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropropanesulfonic acid (PFPrS)	R23-JI0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoropentanesulfonic acid (PFPeS)	R23-JI0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorohexanesulfonic acid (PFHxS)	R23-JI0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluoroheptanesulfonic acid (PFHpS)	R23-JI0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorooctanesulfonic acid (PFOS)	R23-JI0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Perfluorodecanesulfonic acid (PFDS)	R23-JI0004306	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)	R23-JI0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorooctanesulfonic acid(6:2 FTSA)	R23-JI0004306	CP	ug/kg	< 10	< 10	<1	30%	Pass	
1H.1H.2H.2H-perfluorodecanesulfonic acid (8:2 FTSA)	R23-JI0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
1H.1H.2H.2H-perfluorododecanesulfonic acid (10:2 FTSA)	R23-JI0004306	CP	ug/kg	< 5	< 5	<1	30%	Pass	
Duplicate									
Metals M8				Result 1	Result 2	RPD			
Arsenic	R23-JI0004309	CP	mg/kg	3.5	2.7	27	30%	Pass	
Cadmium	R23-JI0004309	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	R23-JI0004309	CP	mg/kg	12	9.5	19	30%	Pass	
Copper	R23-JI0004309	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	R23-JI0004309	CP	mg/kg	12	9.7	18	30%	Pass	
Mercury	R23-JI0004309	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	R23-JI0004309	CP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	R23-JI0004309	CP	mg/kg	5.0	< 5	13	30%	Pass	
Duplicate									
Sample Properties				Result 1	Result 2	RPD			
% Moisture	R23-JI0004313	CP	%	9.1	9.0	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	R23-JI0004314	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	R23-JI0004314	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	R23-JI0004314	CP	mg/kg	< 50	< 50	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	R23-JI0004314	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	R23-JI0004314	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	R23-JI0004314	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	R23-JI0004314	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Chlorinated Hydrocarbons				Result 1	Result 2	RPD			
1.2-Dichlorobenzene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichlorobenzene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3.4-Tetrachlorobenzene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3.5-Tetrachlorobenzene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trichlorobenzene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4.5-Tetrachlorobenzene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichlorobenzene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trichlorobenzene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.4-Dichlorobenzene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzal chloride	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Chlorinated Hydrocarbons				Result 1	Result 2	RPD			
Benzotrichloride	R23-JI0004314	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Benzyl chloride	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Hexachlorobenzene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Hexachlorobutadiene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Hexachlorocyclopentadiene	R23-JI0004314	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Hexachloroethane	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pentachlorobenzene	R23-JI0004314	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organophosphorus Pesticides				Result 1	Result 2	RPD			
Azinphos-methyl	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Bolstar	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorfenvinphos	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Chlorpyrifos-methyl	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Coumaphos	R23-JI0004314	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Demeton-S	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Demeton-O	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Diazinon	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dichlorvos	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Dimethoate	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Disulfoton	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
EPN	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethion	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethoprop	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ethyl parathion	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenitrothion	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fensulfothion	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Fenthion	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Malathion	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Merphos	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methyl parathion	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Mevinphos	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Monocrotophos	R23-JI0004314	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Naled	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Omethoate	R23-JI0004314	CP	mg/kg	< 2	< 2	<1	30%	Pass	
Phorate	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pirimiphos-methyl	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Pyrazophos	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Ronnel	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Terbufos	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tetrachlorvinphos	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Tokuthion	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Trichloronate	R23-JI0004314	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	R23-JI0004314	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1221	R23-JI0004314	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	R23-JI0004314	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1242	R23-JI0004314	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1248	R23-JI0004314	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	R23-JI0004314	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	R23-JI0004314	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	R23-JI0004314	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	R23-JI0004315	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	R23-JI0004315	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	R23-JI0004315	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	R23-JI0004315	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	R23-JI0004315	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	R23-JI0004315	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	R23-JI0004315	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-HCH	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-HCH	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Toxaphene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Chlorinated Hydrocarbons				Result 1	Result 2	RPD			
1.2-Dichlorobenzene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichlorobenzene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3.4-Tetrachlorobenzene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3.5-Tetrachlorobenzene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trichlorobenzene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate								
Chlorinated Hydrocarbons				Result 1	Result 2	RPD		
1.2.4.5-Tetrachlorobenzene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.3-Dichlorobenzene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.3.5-Trichlorobenzene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
1.4-Dichlorobenzene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Benzal chloride	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Benzotrichloride	R23-JI0004315	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass
Benzyl chloride	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Hexachlorobenzene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Hexachlorobutadiene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Hexachlorocyclopentadiene	R23-JI0004315	CP	mg/kg	< 1	< 1	<1	30%	Pass
Hexachloroethane	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Pentachlorobenzene	R23-JI0004315	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass
Duplicate								
Organophosphorus Pesticides				Result 1	Result 2	RPD		
Azinphos-methyl	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Bolstar	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorfenvinphos	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorpyrifos	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Chlorpyrifos-methyl	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Coumaphos	R23-JI0004315	CP	mg/kg	< 2	< 2	<1	30%	Pass
Demeton-S	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Demeton-O	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Diazinon	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Dichlorvos	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Dimethoate	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Disulfoton	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
EPN	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethion	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethoprop	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ethyl parathion	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenitrothion	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fensulfothion	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Fenthion	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Malathion	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Merphos	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Methyl parathion	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Mevinphos	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Monocrotophos	R23-JI0004315	CP	mg/kg	< 2	< 2	<1	30%	Pass
Naled	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Omethoate	R23-JI0004315	CP	mg/kg	< 2	< 2	<1	30%	Pass
Phorate	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Pirimiphos-methyl	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Pyrazophos	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Ronnel	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Terbufos	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Tetrachlorvinphos	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Tokuthion	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Trichloronate	R23-JI0004315	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass
Duplicate								
Polychlorinated Biphenyls				Result 1	Result 2	RPD		
Aroclor-1016	R23-JI0004315	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1221	R23-JI0004315	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1232	R23-JI0004315	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass
Aroclor-1242	R23-JI0004315	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass

Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1248	R23-JI0004315	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1254	R23-JI0004315	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1260	R23-JI0004315	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Total PCB*	R23-JI0004315	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	R23-JI0004316	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	R23-JI0004316	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	R23-JI0004316	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	R23-JI0004316	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	R23-JI0004316	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	R23-JI0004316	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	R23-JI0004316	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	R23-JI0004316	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	R23-JI0004316	CP	mg/kg	< 20	< 20	<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
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
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:

Bonnie Pu	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile
Sayeed Abu	Senior Analyst-Asbestos

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.

GHD Pty Ltd ACT
Level 7/16 Marcus Clarke St
Canberra
ACT 2601

Attention: **Rachel Stuckey**

Report **1004697-W**
Project name HUME FOGO AND MRF PROJECT DELIVERY
Project ID 125404560
Received Date Jul 04, 2023

Client Sample ID			**QC301**
Sample Matrix			**Water**
Eurofins Sample No.			**R23-JI0004317**
Date Sampled			**Jul 04, 2023**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	0.02	mg/L	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05
TRH C15-C28	0.1	mg/L	< 0.1
TRH C29-C36	0.1	mg/L	< 0.1
TRH C10-C36 (Total)	0.1	mg/L	< 0.1
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total*	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	82
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.01	mg/L	< 0.01
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05
TRH C6-C10	0.02	mg/L	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001

Client Sample ID			QC301
Sample Matrix			**Water**
Eurofins Sample No.			**R23-JI0004317**
Date Sampled			**Jul 04, 2023**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	82
p-Terphenyl-d14 (surr.)	1	%	110
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
TRH >C10-C16	0.05	mg/L	< 0.05
TRH >C16-C34	0.1	mg/L	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1
TRH >C10-C40 (total)*	0.1	mg/L	< 0.1
Metals M8			
Arsenic	0.001	mg/L	< 0.001
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Copper	0.001	mg/L	< 0.001
Lead	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	< 0.001
Zinc	0.005	mg/L	< 0.005

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
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jul 11, 2023	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jul 04, 2023	14 Days
- Method: LTM-ORG-2010 BTEX and Volatile TRH			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jul 04, 2023	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Polycyclic Aromatic Hydrocarbons	Sydney	Jul 11, 2023	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jul 11, 2023	7 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Metals M8	Sydney	Jul 11, 2023	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

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Company Name: GHD Pty Ltd ACT
Address: Level 7/16 Marcus Clarke St
Canberra
ACT 2601

Project Name: HUME FOGO AND MRF PROJECT DELIVERY
Project ID: 125404560

Order No.: 12540460
Report #: 1004697
Phone: 02 6253 1999
Fax: 02 6253 1911

Received: Jul 4, 2023 3:15 PM
Due: Jul 11, 2023
Priority: 5 Day
Contact Name: Rachel Stuckey

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Chlorinated Hydrocarbons	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254									X	X			
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X
External Laboratory													
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**								
1	BH05_0.0-0.1	Jul 04, 2023		Soil	R23-JI0004303						X	X	
2	BH05_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004304				X	X	X	X	X
3	BH06_0.5-0.8	Jul 04, 2023		Soil	R23-JI0004305						X	X	X
4	QC101	Jul 04, 2023		Soil	R23-JI0004306						X	X	X
5	QC201	Jul 04, 2023		Soil	R23-JI0004307		X						
6	BH06_1.0-1.2	Jul 04, 2023		Soil	R23-JI0004308				X	X	X	X	
7	BH04_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004309	X			X	X	X	X	X
8	BH04_1.2-1.5	Jul 04, 2023		Soil	R23-JI0004310						X	X	
9	BH03_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004311	X			X	X	X	X	X
10	BH03_1.0-1.2	Jul 04, 2023		Soil	R23-JI0004312						X	X	
11	BH01_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004313						X	X	
12	BH01_1.2-1.5	Jul 04, 2023		Soil	R23-JI0004314	X			X	X	X	X	X

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Mitchell
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NATA# 1261 Site# 25466

Brisbane
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Murarrie
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NATA# 1261 Site# 20794

Newcastle
1/2 Frost Drive
Mayfield West NSW 2304
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Eurofins ARL Pty Ltd
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Company Name: GHD Pty Ltd ACT
Address: Level 7/16 Marcus Clarke St
Canberra
ACT 2601

Project Name: HUME FOGO AND MRF PROJECT DELIVERY
Project ID: 125404560

Order No.: 12540460
Report #: 1004697
Phone: 02 6253 1999
Fax: 02 6253 1911

Received: Jul 4, 2023 3:15 PM
Due: Jul 11, 2023
Priority: 5 Day
Contact Name: Rachel Stuckey

Eurofins Analytical Services Manager : Bonnie Pu

Sample Detail						Asbestos - AS4964	CANCELLED	HOLD	Chlorinated Hydrocarbons	Eurofins Suite B15	Moisture Set	Eurofins Suite B7	Per- and Polyfluoroalkyl Substances (PFASs)
Melbourne Laboratory - NATA # 1261 Site # 1254									X	X			
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X
13	BH02_0.3-0.5	Jul 04, 2023		Soil	R23-JI0004315	X			X	X	X	X	X
14	BH02_1.2-1.5	Jul 04, 2023		Soil	R23-JI0004316						X	X	
15	QC301	Jul 04, 2023		Water	R23-JI0004317							X	
16	TRANSPORT SPIKE	Jul 04, 2023		Soil	R23-JI0004318		X						
17	BH05_1.0-1.3	Jul 04, 2023		Soil	R23-JI0004319			X					
18	BH05_1.8-2.0	Jul 04, 2023		Soil	R23-JI0004320			X					
19	BH05_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004321			X					
20	BH06_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004322			X					
21	BH04_2.5-3.0	Jul 04, 2023		Soil	R23-JI0004323			X					
22	BH03_2.0-2.2	Jul 04, 2023		Soil	R23-JI0004324			X					
23	BH03_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004325			X					
24	BH01_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004326			X					
25	BH02_2.3-2.5	Jul 04, 2023		Soil	R23-JI0004327			X					
26	BH02_2.8-3.0	Jul 04, 2023		Soil	R23-JI0004328			X					

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web: www.eurofins.com.au
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Canberra
ACT 2601

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Melbourne Laboratory - NATA # 1261 Site # 1254									X	X			
Sydney Laboratory - NATA # 1261 Site # 18217						X	X	X	X	X	X	X	X
27	BH06_0.3-0.5	Jul 04, 2023		Soil	R23-JI0006246		X						
Test Counts						4	3	10	6	6	13	14	7

eurofins | Environment Testing

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							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Metals M8							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	102			70-130	Pass	
TRH C10-C14	%	95			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	108			70-130	Pass	
Toluene	%	102			70-130	Pass	
Ethylbenzene	%	101			70-130	Pass	
m&p-Xylenes	%	106			70-130	Pass	
o-Xylene	%	105			70-130	Pass	
Xylenes - Total*	%	106			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	83			70-130	Pass	
TRH C6-C10	%	102			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	90			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
LCS - % Recovery									
Metals M8									
Arsenic			%	107			80-120	Pass	
Cadmium			%	99			80-120	Pass	
Chromium			%	96			80-120	Pass	
Copper			%	93			80-120	Pass	
Lead			%	96			80-120	Pass	
Mercury			%	96			80-120	Pass	
Nickel			%	92			80-120	Pass	
Zinc			%	94			80-120	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S23-Jl0008179	NCP	%	78			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S23-Jl0008179	NCP	%	74			70-130	Pass	
Spike - % Recovery									
Metals M8				Result 1					
Arsenic	S23-Jl0017034	NCP	%	97			75-125	Pass	
Cadmium	S23-Jl0017034	NCP	%	92			75-125	Pass	
Chromium	S23-Jl0017034	NCP	%	87			75-125	Pass	
Copper	S23-Jl0017034	NCP	%	84			75-125	Pass	
Lead	S23-Jl0017034	NCP	%	90			75-125	Pass	
Mercury	S23-Jl0017034	NCP	%	90			75-125	Pass	
Nickel	S23-Jl0017034	NCP	%	82			75-125	Pass	
Zinc	S23-Jl0017034	NCP	%	80			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	R23-Jl0004317	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	R23-Jl0004317	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	R23-Jl0004317	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	R23-Jl0004317	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	R23-Jl0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	R23-Jl0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	R23-Jl0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	R23-Jl0004317	CP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	R23-Jl0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	R23-Jl0004317	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	R23-Jl0004317	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	R23-Jl0004317	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	R23-Jl0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	R23-Jl0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	R23-Jl0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	R23-Jl0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	R23-Jl0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(b&j)fluoranthene	R23-JI0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	R23-JI0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	R23-JI0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	R23-JI0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	R23-JI0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	R23-JI0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	R23-JI0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	R23-JI0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	R23-JI0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	R23-JI0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	R23-JI0004317	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	R23-JI0004317	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	R23-JI0004317	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	R23-JI0004317	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Metals M8				Result 1	Result 2	RPD			
Arsenic	S23-JI0012186	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	S23-JI0017710	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S23-JI0012186	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S23-JI0012186	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	S23-JI0012186	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	S23-JI0017710	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	S23-JI0012186	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	S23-JI0012186	NCP	mg/L	< 0.005	< 0.005	<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
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised by:

Bonnie Pu	Analytical Services Manager
Mickael Ros	Senior Analyst-Metal
Roopesh Rangarajan	Senior Analyst-Organic
Roopesh Rangarajan	Senior Analyst-Volatile

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.

CERTIFICATE OF ANALYSIS

Work Order	: **ES2323409**	Page	: 1 of 7
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Rachel Stuckey	Contact	: Sarah Mathew
Address	: LEVEL 7, 16 MARCUS CLARKE ST CANBERRA ACT, AUSTRALIA 2601	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 12540460	Date Samples Received	: 13-Jul-2023 15:00
Order number	: 12540460	Date Analysis Commenced	: 17-Jul-2023
C-O-C number	: ----	Issue Date	: 20-Jul-2023 17:55
Sampler	: Rachel Stuckey		
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*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Evie Sidarta	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

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

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

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

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EP231: Stable isotope enriched internal standards are added to samples prior to extraction. Target compounds have a direct analogous internal standard with the exception of PFPeS, PFHpA, PFDS, PFTrDA and 10:2 FTS. These compounds use an internal standard that is chemically related and has a retention time close to that of the target compound. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. These practices are in line with recommendations in the National Environmental Management Plan for PFAS (Australian HEPA) and also conform to QSM 5.3 (US DoD) requirements.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QC201	----	----	----	----
				Sampling date / time	04-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2323409-001	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		**8.2**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		**6**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		**13**	----	----	----	----
Copper	7440-50-8	5	mg/kg		**8**	----	----	----	----
Lead	7439-92-1	5	mg/kg		**21**	----	----	----	----
Nickel	7440-02-0	2	mg/kg		**4**	----	----	----	----
Zinc	7440-66-6	5	mg/kg		**15**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QC201	----	----	----	----
				Sampling date / time	04-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2323409-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QC201	----	----	----	----
				Sampling date / time	04-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2323409-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids - Continued									
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	----	----	----	----
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	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	QC201	----	----	----	----
				Sampling date / time	04-Jul-2023 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2323409-001	--------	--------	--------	--------
					Result	----	----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		<0.0002	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		<0.0002	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**88.6**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**93.6**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**77.4**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**105**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**102**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**91.4**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**112**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**100**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**108**	----	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**98.0**	----	----	----	----
13C8-PFOA	----	0.0002	%		**101**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	63	125
Toluene-D8	2037-26-5	67	124
4-Bromofluorobenzene	460-00-4	66	131
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

QUALITY CONTROL REPORT

Work Order	: **ES2323409**	Page	: 1 of 11
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Rachel Stuckey	Contact	: Sarah Mathew
Address	: LEVEL 7, 16 MARCUS CLARKE ST CANBERRA ACT, AUSTRALIA 2601	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61-2-8784 8555
Project	: 12540460	Date Samples Received	: 13-Jul-2023
Order number	: 12540460	Date Analysis Commenced	: 17-Jul-2023
C-O-C number	: ----	Issue Date	: 20-Jul-2023
Sampler	: Rachel Stuckey		
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*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Evie Sidarta	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Franco Lentini	LCMS Coordinator	Sydney Organics, Smithfield, NSW

General Comments

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

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

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

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5179416)									
ES2323013-014	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	18	23	22.7	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	5	4	22.5	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	6	9	42.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	10	10	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	25	26	7.2	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	23	27	14.4	No Limit
ES2323277-006	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	36	27	28.9	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	14	10	30.1	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	114	108	5.5	0% - 20%
		EG005T: Lead	7439-92-1	5	mg/kg	130	112	15.2	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	780	654	17.6	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5179421)									
ES2323013-017	Anonymous	EA055: Moisture Content	----	0.1	%	15.2	18.0	17.0	0% - 50%
ES2323277-053	Anonymous	EA055: Moisture Content	----	0.1	%	8.4	8.9	4.7	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5179417)									
ES2323013-014	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2323277-006	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5176572)									
ES2323492-002	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	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 (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5176572) - continued									
ES2323492-002	Anonymous	EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	0.6	0.6	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	0.7	0.7	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	1.3	1.3	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EW2303165-004	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5176571)									
ES2323492-002	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	150	100	38.7	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5176571) - continued									
ES2323492-002	Anonymous	EP071: C29 - C36 Fraction	----	100	mg/kg	120	110	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EW2303165-004	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5178813)									
ES2323372-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2323736-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5176571)									
ES2323492-002	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	220	170	27.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	110	100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EW2303165-004	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5178813)									
ES2323372-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2323736-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 5178813)									
ES2323372-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2323736-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5175897)									
ES2323409-001	QC201	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

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 (%)*
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 5175897) - continued									
ES2323409-001	QC201	EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
ES2323572-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0004	0.0004	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: 5175897)									
ES2323409-001	QC201	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
ES2323572-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.0	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 5175897)									
ES2323409-001	QC201	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

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: 5175897) - continued									
ES2323409-001	QC201	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
ES2323572-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 5175897)									
ES2323409-001	QC201	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
ES2323572-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.0	No Limit

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
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5179416)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	103	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	117	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	116	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	110	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	106	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	102	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	95.7	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5179417)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	90.2	70.0	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5176572)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	95.0	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	92.0	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	99.1	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	97.3	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	98.8	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	103	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	103	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	104	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	86.7	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	100	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	88.6	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	94.0	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	81.8	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	103	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	101	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	111	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5176571)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	112	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	117	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	116	71.0	129

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
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5178813)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	110	72.2	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5176571)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	117	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	115	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	113	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5178813)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	113	72.4	133
EP080: BTEXN (QCLot: 5178813)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	113	76.0	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	109	78.5	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	110	77.4	121
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	108	78.2	121
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	112	81.3	121
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	111	78.8	122
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5175897)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	77.6	72.0	128
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.4	73.0	123
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	67.0	130
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.7	70.0	132
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.4	68.0	136
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.3	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5175897)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	89.8	71.0	135
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.7	69.0	132
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.4	70.0	132
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	93.4	71.0	131
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	100	69.0	133
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	92.1	72.0	129
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	91.2	69.0	133
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.5	64.0	136
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	99.1	69.0	135
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.6	66.0	139
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	78.6	69.0	133

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
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5175897)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	97.6	67.0	137
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	95.4	71.6	129
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	93.0	69.8	131
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	106	68.7	130
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	110	65.1	134
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	87.2	63.0	144
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	95.0	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5175897)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	92.2	62.0	145
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	96.2	64.0	140
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	78.8	65.0	137
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	99.4	69.2	143

Matrix Spike (MS) Report

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

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5179416)							
ES2323013-014	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	103	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	103	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	103	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	107	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	104	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	103	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	106	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5179417)							
ES2323013-014	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	85.4	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5176572)							
EW2303165-004	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	96.9	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	89.5	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5176571)							
EW2303165-004	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	117	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	114	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	128	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5178813)							
ES2323372-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	105	60.4	142
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5176571)							
EW2303165-004	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	110	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	118	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	130	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5178813)							
ES2323372-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	107	61.1	142
EP080: BTEXN (QCLot: 5178813)							
ES2323372-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	100	62.1	122
		EP080: Toluene	108-88-3	2.5 mg/kg	96.8	66.6	119
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	100	67.4	123
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	99.5	66.4	121
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	103	70.7	121
		EP080: Naphthalene	91-20-3	2.5 mg/kg	98.1	61.1	115
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 5175897)							
ES2323409-001	QC201	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	91.5	72.0	128
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	88.3	73.0	123
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	79.7	67.0	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	96.7	70.0	132
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	100	68.0	136
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	96.0	59.0	134
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 5175897)							
ES2323409-001	QC201	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	104	71.0	135
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	101	69.0	132
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	90.8	70.0	132
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	92.5	71.0	131
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	97.8	69.0	133
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	89.9	72.0	129
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	90.6	69.0	133
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	87.1	64.0	136
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	97.4	69.0	135
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	101	66.0	139

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: 5175897) - continued							
ES2323409-001	QC201	EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	82.6	69.0	133
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 5175897)							
ES2323409-001	QC201	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	95.8	67.0	137
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	97.1	71.6	129
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	84.6	69.8	131
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	94.8	68.7	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	100	65.1	134
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	88.3	63.0	144
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	97.5	61.0	139
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 5175897)							
ES2323409-001	QC201	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	101	62.0	145
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	97.4	64.0	140
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	82.3	65.0	137
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	104	69.2	143

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2323409**	Page	: 1 of 6
Client	: **GHD PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: Rachel Stuckey	Telephone	: +61-2-8784 8555
Project	: 12540460	Date Samples Received	: 13-Jul-2023
Site	:	Issue Date	: 20-Jul-2023
Sampler	: Rachel Stuckey	No. of samples received	: 1
Order number	: 12540460	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)							
Soil Glass Jar - Unpreserved (EA055)							
QC201	04-Jul-2023	----	----	----	18-Jul-2023	18-Jul-2023	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
QC201	04-Jul-2023	18-Jul-2023	31-Dec-2023	✓	19-Jul-2023	31-Dec-2023	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
QC201	04-Jul-2023	18-Jul-2023	01-Aug-2023	✓	20-Jul-2023	01-Aug-2023	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
QC201	04-Jul-2023	18-Jul-2023	18-Jul-2023	✓	19-Jul-2023	27-Aug-2023	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
QC201	04-Jul-2023	18-Jul-2023	18-Jul-2023	✓	18-Jul-2023	18-Jul-2023	✓
Soil Glass Jar - Unpreserved (EP071)							
QC201	04-Jul-2023	18-Jul-2023	18-Jul-2023	✓	20-Jul-2023	27-Aug-2023	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
QC201	04-Jul-2023	18-Jul-2023	18-Jul-2023	✓	18-Jul-2023	18-Jul-2023	✓
Soil Glass Jar - Unpreserved (EP071)							
QC201	04-Jul-2023	18-Jul-2023	18-Jul-2023	✓	20-Jul-2023	27-Aug-2023	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
QC201	04-Jul-2023	18-Jul-2023	18-Jul-2023	✓	18-Jul-2023	18-Jul-2023	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
Soil Glass Jar - Unpreserved (EP231X)							
QC201	04-Jul-2023	17-Jul-2023	31-Dec-2023	✓	18-Jul-2023	26-Aug-2023	✓
EP231B: Perfluoroalkyl Carboxylic Acids							
Soil Glass Jar - Unpreserved (EP231X)							
QC201	04-Jul-2023	17-Jul-2023	31-Dec-2023	✓	18-Jul-2023	26-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
EP231C: Perfluoroalkyl Sulfonamides							
Soil Glass Jar - Unpreserved (EP231X) QC201	**04-Jul-2023**	**17-Jul-2023**	31-Dec-2023	✓	**18-Jul-2023**	26-Aug-2023	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids							
Soil Glass Jar - Unpreserved (EP231X) QC201	**04-Jul-2023**	**17-Jul-2023**	31-Dec-2023	✓	**18-Jul-2023**	26-Aug-2023	✓
EP231P: PFAS Sums							
Soil Glass Jar - Unpreserved (EP231X) QC201	**04-Jul-2023**	**17-Jul-2023**	31-Dec-2023	✓	**18-Jul-2023**	26-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	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

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

Analytical Methods	Method	Matrix	Method Descriptions
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).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.
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
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

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.

Appendix G

Evaluation of QA/QC procedures

The Data Quality Indicators (DQIs) for sampling techniques and laboratory analysis of collected samples identify the acceptable level of error for this assessment. The DQIs adopted in this assessment comprise five components: precision, accuracy, representativeness, comparability and completeness.

A full review of all laboratory reports and sampling has been completed and is included as a data evaluation report for each laboratory batch. The outcomes are summarised in the following sections.

This QA/QC analysis has been developed with respect to soil samples only and excludes the dam water samples which were not collected by GHD.

G-1 Precision

Precision measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory field data and sampling techniques is assessed by calculating the relative percentage difference (RPD) of duplicate samples using the equation below where C_0 is the analyte concentration from the primary sample, and C_d is the analyte concentration from the secondary or duplicate sample.

$$RPD = \frac{|C_0 - C_d|}{\left(\frac{C_0 + C_d}{2}\right)} x\ 100$$

G-1-1 Duplicate samples

Relative percentage difference calculations are a quantitative measure of the accuracy of the analytical results. AS 4482.1 – 2005 (Standards Australia, 2005) typical RPDs are expected to range between 30% and 50%; however, this may be higher for concentrations which are close to the laboratory LOR, and in heterogenous media. Due to this the following RPD limits are adopted:

– ± 200% RPD for field duplicates and inter-laboratory duplicates for any analyte concentration between one and ten times the laboratory limit of reporting (LOR).

– ± 30% RPD for field duplicates and inter-laboratory duplicates for non-organic analyte concentrations greater than ten times the limit of reporting

– ± 50% RPD for field duplicates and inter-laboratory duplicates for organic analyte concentrations greater than ten times the limit of reporting

GHD notes that there is likely to be a degree of heterogeneity within the material. This heterogeneity is expected to be reflected in the RPD. Additionally, two inter-lab samples were lost in transit and could not be used for analysis.

Table G.1 Summary of analysed duplicates

Location type	Sample count		
	Primary samples analysed	Intra-lab samples analysed	Inter-lab samples analysed.
Borehole	16	1	1

Duplicate samples are required to be completed at a rate of 1:20 (5%) for both inter-lab and intra-lab duplicates giving a combined rate of 1:10 (10%).

For 16 primary soil samples, one intra-lab duplicates and one inter-lab duplicates were analysed. This gives an individual rates of 6.3% for both intra- and inter-lab duplicates, with a combined rate of 12.6%. This is above the NEMP requirements.

The RPD results are presented in Table G.2 below. The concentrations in duplicate samples reported were both greater than and less than the concentrations for the primary data set, indicating that no systemic bias to either higher results potentially leading to false detections or false exceedances of criteria (a positive bias) or to lower results potentially leading to false non-detects or false compliance with criteria (a negative bias). It is considered that the RPD exceedances can generally be attributed to heterogeneity of material across the site and are not considered to affect the chemical classification of the material.

Table G.2 Discussion of RPD exceedances

Primary sample ID	Duplicate sample ID	Duplicate type	Analyte	RPD	Discussion
BH06_0.5-0.8	QC201	Inter-lab	Zinc	31%	**Zinc** reported a primary concentration in this duplicate pair of 11 mg/kg, with a duplicate concentration of 15 mg/kg. The RPD in this instance is very small and close to the LOR. Therefore, this RPD is not considered to affect the chemical classification of the material.

The full RPD table is presented below.

Appendix F
Table G-1
RPD Table

Transport Canberra and City Services
ACT MRF
Hume FOGO and MRF Project Delivery

Lab Report Number	1004697	1004697		1004697	ES2323409	
Field ID	BH06_0.5-0.8	QC101	**RPD**	BH06_0.5-0.8	QC201	**RPD**
Sample Type	Normal	Field_D		Normal	Field_D	
Matrix Type	Soil	Soil		Soil	Soil	
Sample Date	4/07/2023	4/07/2023		4/07/2023	4/07/2023	

	Chem Name	Units	EQL						
Metals									
	Arsenic	mg/kg	2 : 5 (Interlab)	5.1	5.2	2	5.1	6	16
	Cadmium	mg/kg	0.4 : 1 (Interlab)	<0.4	<0.4	0	<0.4	<1	0
	Chromium (III+VI)	mg/kg	5 : 2 (Interlab)	12	12	0	12	13	8
	Copper	mg/kg	5	7.4	7.7	4	7.4	8	8
	Lead	mg/kg	5	16	18	12	16	21	27
	Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0
	Nickel	mg/kg	5 : 2 (Interlab)	<5	<5	0	<5	4	0
	Zinc	mg/kg	5	11	14	24	**11**	**15**	**31**
BTEXN									
	Benzene	mg/kg	0.1 : 0.2 (Interlab)	<0.1	<0.1	0	<0.1	<0.2	0
	Toluene	mg/kg	0.1 : 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0
	Ethylbenzene	mg/kg	0.1 : 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene (o)	mg/kg	0.1 : 0.5 (Interlab)	<0.1	<0.1	0	<0.1	<0.5	0
	Xylene (m & p)	mg/kg	0.2 : 0.5 (Interlab)	<0.2	<0.2	0	<0.2	<0.5	0
	Xylene Total	mg/kg	0.3 : 0.5 (Interlab)	<0.3	<0.3	0	<0.3	<0.5	0
	Naphthalene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
TRH - NEPM 2013									
	F1 (C6-C10 minus BTEX)	mg/kg	20 : 10 (Interlab)	<20	<20	0	<20	<10	0
	C6-C10 Fraction	mg/kg	20 : 10 (Interlab)	<20	<20	0	<20	<10	0
	F2 (>C10-C16 minus Naphthalene)	mg/kg	50	<50	<50	0	<50	<50	0
	>C10-C16 Fraction	mg/kg	50	<50	<50	0	<50	<50	0
	F3 (>C16-C34 Fraction)	mg/kg	100	<100	<100	0	<100	<100	0
	F4 (>C34-C40 Fraction)	mg/kg	100	<100	<100	0	<100	<100	0
	>C10-C40 (Sum of Total)	mg/kg	100 : 50 (Interlab)	<100	<100	0	<100	<50	0
TRH - NEPM 1999									
	C6-C9 Fraction	mg/kg	20 : 10 (Interlab)	<20	<20	0	<20	<10	0
	C10-C14 Fraction	mg/kg	20 : 50 (Interlab)	<20	<20	0	<20	<50	0
	C15-C28 Fraction	mg/kg	50 : 100 (Interlab)	<50	<50	0	<50	<100	0
	C29-C36 Fraction	mg/kg	50 : 100 (Interlab)	<50	<50	0	<50	<100	0
	C10-C36 (Sum of Total)	mg/kg	50	<50	<50	0	<50	<50	0
PAHs - standard 16									
	Acenaphthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Acenaphthylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Benz(a)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(a)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo[b+j]fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(k)fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Benzo(g,h,i)perylene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Chrysene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Dibenz(a,h)anthracene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Fluoranthene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Fluorene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Indeno(1,2,3-c,d)pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Phenanthrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Pyrene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	PAHs (Sum of total) - Lab calc	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Total 8 PAHs (as BaP TEQ)(zero LOR) - Lab Calc	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0
	Total 8 PAHs (as BaP TEQ) (half LOR) - Lab Calc	mg/kg	0.5	0.6	0.6	0	0.6	0.6	0
	Total 8 PAHs (as BaP TEQ)(full LOR) - Lab Calc	mg/kg	0.5	1.2	1.2	0	1.2	1.2	0
PFAS - Perfluoroalkyl Sulfonic Acids									
	Perfluoropropanesulfonic acid (PFPrS)	mg/kg	0.005	<0.005	<0.005	0	<0.005		
	Perfluorobutane sulfonic acid (PFBS)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	Perfluoropentane sulfonic acid (PFPeS)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	Perfluorohexane sulfonic acid (PFHxS)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	Perfluoroheptane sulfonic acid (PFHpS)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	Perfluorooctane sulfonic acid (PFOS)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	Perfluorodecanesulfonic acid (PFDS)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
PFAS - Perfluoroalkyl Carboxylic Acids									
	Perfluorobutanoic acid (PFBA)	mg/kg	0.005 : 0.001 (Interlab)	<0.005	<0.005	0	<0.005	<0.001	0
	Perfluoropentanoic acid (PFPeA)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	Perfluorohexanoic acid (PFHxA)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	Perfluoroheptanoic acid (PFHpA)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	Perfluorooctanoic acid (PFOA)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	Perfluorononanoic acid (PFNA)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	Perfluorodecanoic acid (PFDA)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	Perfluoroundecanoic acid (PFUnDA)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	Perfluorododecanoic acid (PFDoDA)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	Perfluorotridecanoic acid (PFTrDA)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	Perfluorononane sulfonate (PFNS)	mg/kg	0.005	<0.005	<0.005	0	<0.005		
	Perfluorotetradecanoic acid (PFTeDA)	mg/kg	0.005 : 0.0005 (Interlab)	<0.005	<0.005	0	<0.005	<0.0005	0
PFAS - Perfluoroalkyl Sulfonamide									
	Perfluorooctane sulfonamide (FOSA)	mg/kg	0.005 : 0.0002 (Interlab)	<0.005	<0.005	0	<0.005	<0.0002	0
	N-Methyl perfluorooctane sulfonamide (MeFOSA)	mg/kg	0.005 : 0.0005 (Interlab)	<0.005	<0.005	0	<0.005	<0.0005	0
	N-Ethyl perfluorooctane sulfonamide (EtFOSA)	mg/kg	0.005 : 0.0005 (Interlab)	<0.005	<0.005	0	<0.005	<0.0005	0
	N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	mg/kg	0.01 : 0.0002 (Interlab)	<0.01	<0.01	0	<0.01	<0.0002	0
	N-Methyl perfluorooctane sulfonamidoethanol (MEFOSE)	mg/kg	0.005 : 0.0005 (Interlab)	<0.005	<0.005	0	<0.005	<0.0005	0
	N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	mg/kg	0.005 : 0.0005 (Interlab)	<0.005	<0.005	0	<0.005	<0.0005	0
	N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	mg/kg	0.01 : 0.0002 (Interlab)	<0.01	<0.01	0	<0.01	<0.0002	0
PFAS - Fluorotelomer Sulfonic Acids									
	4:2 Fluorotelomer sulfonic acid (4:2 FTS)	mg/kg	0.005 : 0.0005 (Interlab)	<0.005	<0.005	0	<0.005	<0.0005	0
	6:2 Fluorotelomer Sulfonate (6:2 FTS)	mg/kg	0.01 : 0.0005 (Interlab)	<0.01	<0.01	0	<0.01	<0.0005	0
	8:2 Fluorotelomer sulfonic acid (8:2 FTS)	mg/kg	0.005 : 0.0005 (Interlab)	<0.005	<0.005	0	<0.005	<0.0005	0
	10:2 Fluorotelomer sulfonic acid (10:2 FTS)	mg/kg	0.005 : 0.0005 (Interlab)	<0.005	<0.005	0	<0.005	<0.0005	0
PFAS - Sums									
	Sum of PFHxS and PFOS	mg/kg	0.005 : 0.0002 (Interlab)	<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		
	PFAS (Sum of Total)	mg/kg	0.05 : 0.0002 (Interlab)	<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		
	PFAS (Sum of Total)(WA DER List)	mg/kg	0.01 : 0.0002 (Interlab)	<0.01	<0.01	0	<0.01	<0.0002	0

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

****Bold indicates high RPDs (Acceptable RPDs for each EQL multiplier range are: 30 (1-10 x EQL); 30 (10-30 x EQL); 30 (> 30 x EQL))**

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

G-1-2 Transport spike

Transport spike samples are used to estimate the potential for volatile contamination to be lost during storage and transportation of samples. Transport spikes were included for soil samples.

No transport spikes were obtained for the program as the Eurofins laboratory did not have any usable transport spikes at the time of delivery. Given that no samples reported concentrations of volatiles above the laboratory reporting limits and exceedance of adopted human health screening criteria, absence of transport spike is not considered to have impact on the precision of analytical data. This is not expected to impact results.

G-1-3 Transport blank

Transport blank samples are used to estimate the potential for contamination to be introduced during the transport and storage of samples from issuing the sample containers from the laboratory, during sampling, through to the time of analysis.

No transport blanks were obtained for the program as the Eurofins laboratory did not have any usable transport blanks at the time of delivery. Given that no samples reported concentrations of COPC in exceedance of adopted health screening criteria, absence of transport blank sample is not considered to have impact on precision of analytical data.

G-2 Accuracy

1-1-1 Matrix spike

Matrix spike sample analysis is the analysis of one or more replicate portions of samples from the batch, after fortifying the additional portion(s) with known quantities of the analyte(s) of interest. The percentage recovery of target analyte(s) from matrix spike samples is used to determine the bias of the method in the specific sample matrix. Recoveries should lie between 30% and 150%.

Matrix spikes were all within the recovery limits.

1-1-2 Rinsate blanks

Rinsate blank samples are used to estimate the amount of cross-contamination potentially introduced during the re-use of sampling equipment.

The following sample collection methods were used to minimize cross contamination:

– Boreholes – samples were taken from soil which had not been in contact with the drill bit to avoid cross-contamination.

The methodologies listed above were designed to prevent cross-contamination and new disposable nitrile gloves were worn for collection of each sample. Rinsate was taken from clean nitrile gloves given this was the point of contact for the samples.

Rinsate blank did not record any detections as shown below.

Lab Report Number	1004697
Field ID	QC301
Sample Date	04-Jul-23
Sample Type	Rinsate

Chem Group	ChemName	Unit	EQL	
Metals	Arsenic	mg/L	0.001	<0.001
	Cadmium	mg/L	0.0002	<0.0002
	Chromium (III+VI)	mg/L	0.001	<0.001
	Copper	mg/L	0.001	<0.001
	Lead	mg/L	0.001	<0.001
	Mercury	mg/L	0.0001	<0.0001
	Nickel	mg/L	0.001	<0.001
	Zinc	mg/L	0.005	<0.005
BTEXN	Benzene	µg/L	1	<1
	Toluene	µg/L	1	<1
	Ethylbenzene	µg/L	1	<1
	Xylene (o)	µg/L	1	<1
	Xylene (m & p)	µg/L	2	<2
	Xylene Total	µg/L	3	<3
	Naphthalene	µg/L	1	<1
TRH - NEPM 2013	F1 (C6-C10 minus BTEX)	µg/L	20	<20
	C6-C10 Fraction	µg/L	20	<20
	F2 (>C10-C16 minus Naphthalene)	µg/L	50	<50
	>C10-C16 Fraction	µg/L	50	<50
	F3 (>C16-C34 Fraction)	µg/L	100	<100
	F4 (>C34-C40 Fraction)	µg/L	100	<100
	>C10-C40 (Sum of Total)	µg/L	100	<100
TRH - NEPM 1999	C6-C9 Fraction	µg/L	20	<20
	C10-C14 Fraction	µg/L	50	<50
	C15-C28 Fraction	µg/L	100	<100
	C29-C36 Fraction	µg/L	100	<100
	C10-C36 (Sum of Total)	µg/L	100	<100
PAHs - standard 16	Acenaphthene	µg/L	1	<1
	Acenaphthylene	µg/L	1	<1
	Anthracene	µg/L	1	<1
	Benz(a)anthracene	µg/L	1	<1
	Benzo(a)pyrene	µg/L	1	<1
	Benzo[b+j]fluoranthene	µg/L	1	<1
	Benzo(k)fluoranthene	µg/L	1	<1
	Benzo(g,h,i)perylene	µg/L	1	<1
	Chrysene	µg/L	1	<1
	Dibenz(a,h)anthracene	µg/L	1	<1
	Fluoranthene	µg/L	1	<1
	Fluorene	µg/L	1	<1
	Indeno(1,2,3-c,d)pyrene	µg/L	1	<1
	Phenanthrene	µg/L	1	<1
	Pyrene	µg/L	1	<1
	PAHs (Sum of total) - Lab calc	µg/L	1	<1

G-3 Representativeness

G-3-1 Appropriate sampling

Sample jars for soil samples were provided from the laboratory and were of an appropriate size and material for the required analysis.

G-3-2 Holding times

Holding times for each batch are discussed in the relevant a data validation reports for each laboratory batch.

The holding times were met for all samples, see Appendix F.

G-3-3 Limits of reporting

Limits of reporting were equal to or below the assessment criterion for all analytes.

G-4 Comparability

Comparability expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples, ensuring analysing laboratories use consistent analysis techniques and reporting methods.

Sampling was conducted following consistent methods and with reference to the procedures in the GHD standard operating procedures.

Laboratory analysis was undertaken by NATA accredited laboratories for both primary and secondary analysis and samples.

G-5 Completeness

Sample descriptions as provided in borehole logs are complete and appropriate.

The chain of custody documentation and procedure was completed.

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